

The Native American Church, Peyote, and Health: Expanding Consciousness for Healing Purposes

Peter N. Jones

*Since the passage of the Comprehensive Drug Abuse Prevention and Control Act of 1970, Native American Church (NAC) members have continually had to defend their legal right to use the sacred cactus peyote (*Lophophora williamsii*). This legal right was established with the passage of 21 CFR 1307.31, which exempts peyote's Schedule I status for NAC members. The exemption, however, continues to be challenged by power-based social arrangements. This article provides a brief history of the NAC, its use of peyote, the Native American beliefs behind the use of peyote, and psychopharmacological data concerning the cactus. It is argued that NAC members do not use peyote as a hallucinogenic drug but as a means whereby members expand access to parts of their consciousness for healing purposes. These healing purposes foster health, balance, respect, and a sense of community among NAC members and their social relations, providing a means of maintaining individual and social justice for Native Americans.*

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Introduction

The Native American Church (NAC) and its use of peyote is a pan-Indian religious tradition that is practiced to some extent on most reservations in the United States and Canada. It involves Native Americans ingesting peyote during an all-night ceremony that involves singing, drumming, praying, and curing. According to NAC members, 'The purpose of Peyote is to clear the mind. The mind functions in all kinds of manners, thinking of many things. When you take the Medicine, God's spirit power is in the Medicine. It clears the mind' (Smith & Snake, 1996, p. 40)

Correspondence to: Bāuu Institute, Saybrook Graduate School, PO Box 4445, Boulder, CO 80306. Email: pnj@bauuinstitute.com

That NAC members do not use peyote in a deviant manner is historically well established (Slotkin, 1975; Stewart, 1986). Despite this, because of peyote's use as a hallucinogenic drug by members of American society, it was classified as a Schedule I controlled substance with the passage of the Comprehensive Drug Abuse Prevention and Control Act of 1970. NAC members had to defend their use of peyote, arguing that they did not use the cactus for hallucinogenic purposes but as a sacrament for healing purposes. The federal government, with the passage of Title 21 CFR 1307.31, recognized this use:

The listing of peyote as a controlled substance in Schedule I does not apply to the nondrug use of peyote in bona fide religious ceremonies of the Native American Church, and members of the Native American Church so using peyote are exempt from registration. Any person who manufactures peyote for or distributes peyote to the Native American Church, however, is required to obtain registration annually and to comply with all other requirements of law.

This exemption, however, has come under continual attack as a result of power-based, invasive social arrangements that do not afford Native Americans and their traditions equal status with traditions of Euro-American origin. The use of peyote by NAC members provides a means of expanding access to parts of their consciousness for healing purposes. This healing facilitates individual and social justice solutions by allowing NAC members to arrive at need-based solutions.

My purpose here, therefore, is to describe the emic beliefs behind the NAC's sacramental use of peyote and to demonstrate that, for members of the NAC, the ingestion of peyote facilitates access to certain cognitive structures and mechanisms, effectively expanding the individual's consciousness. In order to do this, I will offer a brief history of the NAC and its use of peyote, the emic beliefs behind the ingestion of peyote by NAC members, and the psychopharmacology of the cactus. Both folk psychological emic beliefs and psychopharmacological data demonstrate that the ingestion of peyote, under ceremonial conditions, acts as a mechanism to expand an individual's consciousness, thereby rendering the argument that peyote is simply a hallucinogenic drug used by deviants devoid of meaning. As NAC members have known for well over 100 years, the sacramental ingestion of peyote facilitates consciousness expansion, allowing users not only to heal their physical, mental, and spiritual imbalances but also to envision individual and social justice solutions to the struggles of daily life.

History of the Native American Church

The history of the NAC and its sacramental use of peyote by Native Americans is long and complex; only an overview can be given here. For a more in-depth analysis of the various theories around the development of the NAC I refer the reader to Stewart's *The Peyote Religion* (1987).

Prior to the official establishment of the NAC, Native Americans used peyote in various religious contexts for thousands of years, as we know from solid archaeological evidence (Bruhn, De Smet, El-Seedi, & Beck, 2002; Ripinsky-Naxon, 1993). The first historically documented reports of peyote use by Native Americans come from early

Spanish missionary records dating to the late 1600s and early 1700s. For example, Slotkin (1955, pp. 208–209) found early records documenting peyotism among several Native American tribes: '(a) the Southwest: Queres, 1631; Hopi, Isleta, and Taos, 1720; Pima, circa 1764; (b) Gulf: Coahuileteco, 1760; and (c) marginal Southern Plains: Caddo, 1709.' Similarly, one of the earliest

and most important early medical description of the effects of peyote is that of the physician Juan de Cardenas, whose work was published in Mexico in 1591 under the title *Problemas y secretos maravillosos de las indias* (Problems and Miraculous Secrets of the Indians). (Anderson, 1996, p. 7)

Since peyote is indigenous to a geographic area that extends from north of the Rio Grande River in Texas to the southern part of the Chihuahuan desert and the Tamaulipan thorn forests in Mexico, it can reasonably be concluded that knowledge of peyote and its use had been held by many southern plains and southwestern tribes in the United States, as well as tribes located in present-day Mexico, for thousands of years (Anderson, 1996; Slotkin, 1955).

Out of this long history, the NAC formed, primarily through the combination of earlier indigenous ceremonies, the introduction of Christianity to Native Americans in the 1800s, and various demographic pressures which brought some of the southern plains tribes into increasing contact with northern Mexican tribes who had been using peyote in religious contexts for thousands of years (Anderson, 1996; Ripinsky-Naxon, 1993; Slotkin, 1955). During the early 1800s, as many tribes were either forced onto reservations in the newly formed Indian territory of Oklahoma or were forced out of their traditional homelands by Euro-American colonizers, various aspects of Native American culture came under attack. These colonial, power-based social arrangements were especially apparent on the newly formed reservations:

From an Indian perspective, life on the reservation was still dominated by white intrusions. The sustenance on many reservations was almost wholly dependent upon some kind of annuity assistance from the federal government. Christian missionaries and teachers flooded the reservations in an attempt to 'civilize' and assimilate the Indians. (Deloria & Lytle, 1984, p. 7)

Thus, for many Native American tribes, and especially those of the southern plains, a cultural lifeway¹ was completely uprooted, and the development of new social and psychological tools became necessary in order to cope with the suppression and loss of their traditional ways. During the 1880s, with the newly increasing availability of peyote by means of horses introduced by Euro-American colonizers (Haines, 1938a, 1938b), and with the needs-denying arrangements of life on the reservation (Stewart, 1987, p. 68), certain indigenous peyote rituals of some of the southern plains and northern Mexican tribes were incorporated into and masked under the newly imposed and supported Christian teachings as one of these new social and psychological tools. Slotkin (1975) discusses this process in terms of revitalization movements:

On this basis I would hazard a guess that the fully developed Peyote Religion was invented about 1885 by Comanche or Kiowa living at the Kiowa, Comanche and Wichita Agency in what is now Oklahoma. Before that time many tribes, both in the southern Plains and to

the north, were slightly acquainted with the Peyote plant, the old Peyote complex, or a religion-like rite. (Slotkin, 1975, p. 34)

Stewart (1987) arrives at a slightly different conclusion in his analysis, arguing that, of the southern plains tribes, 'the evidence is strongly in favor of finding the Carrizo to be the originators of the peyote ceremony' (p. 49). He also argues that because the Carrizo are the Coahuitlecan-speaking people who were the original inhabitants of peyote's primary growth area—and were engaged in the ritual use of peyote in an all-night ceremony involving singing and drumming around a circle dating back to at least as early as 1649—they were most probably the originators of the modern-day NAC.

During the formation of reservations and their ensuing power-based social arrangements in the late 1800s, the 'new peyote ceremony' emerged which came to be called the NAC. This new peyote ceremony consisted of five basic elements, which transcended any single tribal cosmology and helped with its eventual spread and pan-Indian acceptance as a needs-based solution: use of traditional Native American religious symbols; incorporation of Native American spiritual elements including 'visions'; a pan-indigenous sentiment; a belief in salvation as well as an ethical code; and certain parts of the new Christian religion (Anderson, 1996). 'The Peyote Religion was nativistic but not militant,' Slotkin says, 'Culturally, it permitted the Indians to achieve a cultural organization in which they took pride. Socially, it provided a supernatural means of accommodation to the existing domination–subordination relation' (1975, pp. 20–21).

In conjunction with these cultural functions, the NAC and its ingestion of peyote also provided a needs-based solution to psychological problems Native Americans were encountering in the newly enforced reservation system. The cactus's psychopharmacology allowed NAC members access to expanded consciousness, and thus to heal physical, mental, and spiritual imbalances within themselves and among their social relations, helping to assuage the effects of the needs-denying arrangements of the reservation system.

Likewise, the NAC did not displace other Native American religious traditions or practices, but instead was recognized as a powerful new social and psychological tool for helping Native Americans cope with the newly emerging reservation lifeway. This has been eloquently explained by Aberle (1982) with respect to the Navajo way of life:

Although changes in their experience of power relationships affected Navajo views of supernatural power, traditional Navajo religion did not lose its appeal for most Navajos. Rather, some people began to feel that additional power was needed. In the Navajo country, it would appear that Peyotists thought that each religion not only had its own power, but also that it could contribute to the power of the others. (p. xxv)

The Native American Church Peyote Ceremony

The NAC peyote ritual can be summarized as an all-night ceremony that involves communication with God (or some other metaphysical entity) and communion with one's fellow worshippers and one's interpersonal self (Stewart, 1986). 'Prayer, song, drumming, and the eating of peyote are all regarded as forms of communication with

God, and the peyote experience is thought to permit communication from Him through reflection, illumination, or visual and auditory hallucination' (Aberle, 1982, p. 11).

During this ceremony, individuals meet together in a special place, inside a tipi or some other ceremonial structure, where they face a crescent-shaped altar with a fire. The ceremony generally consists of four basic parts: praying; singing; ingestion of peyote; and quiet contemplation (Anderson, 1996). It is through this ritual ceremony that individuals frequently have personal revelations or cognitive experiences that can lead to forgiveness of one's sins, alleviation of bodily and spiritual ills, a greater sense of community, and to the practice of moral and ethical ways of life (Aberle, 1982; Anderson, 1996; Stewart, 1987). The ingestion of peyote, then, is a way for individuals to access certain cognitive structures and mechanisms within their brains that effectively expand consciousness, resulting in physical, mental, and spiritual benefits.

Although the NAC can now be found in all parts of the United States, and even in Canada and Alaska, each tribe and each Roadman (the name given to the individual who 'leads' the ceremony) performs ceremonies differently. However, as Stewart (1987) noted:

[T]he peyote ritual in its two variations—Cross Fire and Half Moon—is everywhere the same throughout the United States and Canada. The theological rule that the ceremonial leader of each peyote service is free to conduct the meeting as he wishes allows for minor variations; nevertheless, nearly all rituals fit into either the Half Moon or Cross Fire pattern. (p. 339)

A peyote ceremony may be called for a number of reasons by almost anyone. The usual purpose is to cure an ill person, but ceremonies can also be called to give thanks for being cured, to pray for loved ones who are away at school or in the military, to celebrate birthdays and holidays, or to bless or help someone having a particular problem (Anderson, 1996). Usually the person who calls the ceremony also 'sponsors' it, in that he or she obtains the peyote, arranges for the quarters and officials, and provides food for the thanksgiving breakfast the following morning. Other members may help with the arrangements if the sponsor cannot afford the food or other items, and in many cases the Roadman provides the peyote (Anderson, 1996).

Normally four officials preside over and help lead the ceremony: the Roadman (also called the Road Chief, or simply 'the leader'); the Chief Drummer; the Cedarman; and the Fire Chief (Stewart 1987, p. 346). Each has certain functions to perform during the ceremony. In most tribes, an aspiring peyotist progresses from one position to another by learning the necessary functions, prayers, and songs for each office. NAC members emphasize that the Roadman is not a priest or intermediary, but rather a leader of the ceremony who facilitates each individual's own experience (Anderson, 1996). Furthermore, it should be stressed that these positions are not dictated by gender.

The ritual objects of the NAC ceremony, although somewhat variable in construction, are otherwise remarkably uniform among the different tribes and NAC chapters. The Roadman usually carries a special satchel or box containing the ritual objects: the iron pot that will be made into a water drum; a piece of buckskin for the drumhead; a cord and stones with which to tie the drumhead on the pot; a drum stick; a gourd rattle; an eagle wing-bone whistle; a cluster of sage; a staff; various feathers; containers for the

peyote; an altar cloth; a bucket for water; a bag of cedar incense; a bag of tobacco; corn husks or cigarette papers; and a fire stick (Anderson, 1996, p. 53). The intentional construction and maintenance of materials used in a NAC ceremony are as important to the practitioners as the special skills involved in using the objects during the ceremony (Merriam & D'Azevedo, 1957).

Besides the ritual objects involved in a NAC ceremony, the songs sung are unique and highly significant to the peyotist, usually having been given to the singer by peyote itself. A song is like a prayer, acting as a form of communication between all entities involved in the ceremony, and is believed to be very powerful (Merriam & D'Azevedo, 1957). It is usually believed that one should not sing a song at the wrong time, or talk lightly about it. These songs are considered the gift of peyote and must be revered (Anderson, 1996). Peyote songs have many forms and cover a wide variety of textual narrative:

[S]ome tell stories, while others refer to the dawn, to birds or animals, to peyote, to Jesus, to water, or to the participants themselves, urging them to some kind of action such as repentance or prayer. The songs play such a significant part in the peyote ceremony that many Native Americans insist that they are 'praying with their songs,' for they come as a direct revelation from the spiritual realm, the gift of Peyote. (Anderson, 1996, p. 66)

Finally, it should be noted that NAC members maintain that their religion is similar to Euro-American religions in its fundamental nature, and in fact that it is simply one among the innumerable variants of Judeo-Christian theology. The following are a few of the common arguments in Native American apologetics linking the NAC to Judeo-Christian theology:

- NAC members argue that they worship the same God that Christians do, and that the adoption of the Trinity makes the NAC a Judeo-Christian church.
- The Ten Commandments (Exodus, 20:1–17) and the Golden Rule (Matthew, 7:12; Luke, 6:31) have been incorporated into NAC ethics.
- The word 'church' is used to demonstrate that the ritual associations of NAC members are equivalent to those of Euro-Americans, and that peyotism is a Christian religion on par with Judeo-Christian variants.
- NAC members point out essential similarities between their ritual and that of Judeo-Christian variants, such as: both Native Americans and Euro-Americans offer extensive prayers to God; both have sacraments by which supernatural power is believed to be incorporated by the communicant (for Judeo-Christians it is bread and wine, and for Native Americans it is peyote, water, and the foods of the breakfast—corn, meat, and fruit); and some groups place the Bible on the altar and quote from it during the ceremony.
- The Bible is quoted in justification of peyote. One reference is cited universally:

Him that is weak in faith [i.e., the Indian who does not know God] receive ye, but not to doubtful disputations. For one believeth that he may eat all things: another, who is weak [i.e., the Indian vis-à-vis the White], eateth herbs [i.e., Peyote]. Let not him that eateth [Peyote] despise him that eateth not [i.e., the non-Peyotist Christian]; and let not him which eateth not judge him that eateth: for God hath received him [i.e., the Peyotist]. (Romans, 14:1–3; see Slotkin, 1975, p. 66)

Some of the other passages quoted in NAC apologetics are: ‘God said, Let the earth bring forth ... the herb [i.e., Peyote]’ (Genesis, 1.11); ‘And God said, Behold, I have given you every herb [and particularly Peyote]’ (Genesis, 1.29); ‘God made ... every herb of the field [including Peyote]’ (Genesis, 2.4–5); ‘[E]ven as the green herb have I given you all things’ (Genesis, 9.3); ‘[W]ith bitter herbs [i.e., Peyote] they shall eat it’ (Exodus, 12.8; cf. Numbers, 9.11); ‘He causeth the grass to grow for the cattle, and herb for the service of man’ (Psalms, 104.14); ‘For he shall grow up before him as a tender plant, and as a root [i.e., Peyote] out of a dry ground’ (Isaiah, 53.2); ‘[I]f the root be holy’ (Romans, 11.16); and ‘But if thou boast, thou bearest not the root, but the root thee’ (Romans, 11.18). Because of the above passages, Peyote is often referred to as an ‘herb’ or ‘root’ (Slotkin, 1975, p. 66).

Native American Church Beliefs Concerning Peyote

For NAC members, peyote is conceived of not as a hallucinogen or as a drug that is in the same category as other Schedule I status substances. Rather, it is thought to be similar to the Judeo-Christian idea of the Spirit manifesting in the bread and wine of communion. Furthermore, in most Native American ontologies, there is no rigid distinction between the physical and the non-physical, and their epistemology allows for a wider praxis in gaining knowledge of the world (Irwin, 1994; Lillard, 1998; Nisbett & Masuda, 2003; Rushforth, 1992; Vogel, 1970). The Kiowa Apaches, for example, believe that the physical body and the non-physical essence that gives the body its individuality are not separate, and that strictly biological or medical approaches to the treatment of disease are simply without meaning (Bittle, 1960, p. 142).

This epistemological praxis is also true for NAC members. The ontological implications of this epistemology are that when an individual becomes imbalanced, the entire individual is affected, and not simply a physical component of the individual’s body. Within the epistemology of the NAC, therefore, disease and death are the result of an imbalance within the ontology of the individual, or an imbalance within one’s larger social, environmental, and spiritual relations. To avoid or heal an imbalance, Native Americans call into action various powers by means of prayer, fasting, and sacred plants. These actions, I argue, provide a mechanism whereby individuals expand access to parts of their consciousness, allowing the individuals to create their own needs-based solutions. The primary use of sacred plants by most indigenous people in North America has always been religious and at the same time medicinal, because Native American epistemologies do not create a distinction between bodily health and mental or spiritual well-being. So intimate is this relationship between medicine and religion that often the same term refers ‘both to natural drugs as well as any practice or fetish or to supernatural beings that helped to cure the diseases’ (de Pasquale, 1984, p. 5). These epistemological and ontological points are particularly true for NAC members, as evidenced by the fact that many refer to peyote and medicine by the same word: “‘azee” (Navajo), “biisung” (Delaware), “puakit” (Comanche), “makan” (Omaha), “o-jay-bee-kee” (Shawnee), “walena” (Taos), and “naw-tai-no-nee” (Kickapoo)’ (Anderson, 1996, p. 107).

Thus, the two major elements in the NAC peyote experience are the feeling of medical benefit and the experiencing of the power of peyote. As will be discussed below, even relatively small doses of peyote have physiological effects that can be felt by the consumer. These physiological effects are accompanied by, and also facilitate, psychological mechanisms and structures that expand an individual's access to their consciousness. Furthermore, this expansion in access gives the individual experiential proof of the power of peyote, reinforcing the psycho-physiological benefits and experiences. Since NAC members take peyote in a therapeutic, healing context, they seek evidence that peyote is healing them. The psychological expansion in access to various structures and mechanisms within one's consciousness provides the necessary experiential evidence.

These experiences, in fact, are the second important element of the NAC peyote experience. There are many reasons for this but one phenomenological feature seems particularly relevant. When a person eats peyote, something external to them proves able to affect their thinking, their feelings, their perceptions, and behavior, and to do so without their own volition. Additionally, the effects of peyote are unique each time a person participates in a ceremony. As Aberle (1982) discusses:

One Navaho road chief asked me if I had taken peyote, and then asked how often I had eaten it. When I told him that I had done so several times, he asked me with great curiosity, 'Does it affect you the same each time?' 'No,' I said. 'Me either!' This external agent, whose effects on the individual cannot be predicted or fully controlled, is indeed a power. (pp. 8–9)

This phenomenological experience, I argue, is a result of peyote's effect upon the individual; it expands their consciousness by allowing them to access new or little-used cognitive structures and mechanisms. The outcome of this expansion in consciousness is that the individual is able to resolve various physical, mental, and spiritual imbalances, all in all providing novel means to the individual. In some cases, this expansion becomes permanent or can be accessed at will, usually resulting in the individual becoming recognized as having special powers. For example, many of the Great Basin tribes believe that peyotists have power and that this power derives from the inherent power of peyote itself. Peyote power, as manifested through the individual, therefore, has the ability to cure the individual, as well as the individual's larger social and cultural environment, by acting upon the individual and expanding their consciousness.

It is through NAC ceremonies and the sacramental use of peyote that individuals can become healed. As I have argued, and as the ethnographic record testifies to, the healing involved is not just for physical imbalances but for any imbalance in one's life. 'Most such meetings are for every conceivable variety of physical complaint, but meetings are also held for people suffering from mental illness' (Aberle, 1982, p. 125). Likewise, a meeting may be held to give thanks for being healed, which helps prevent future imbalances from occurring (Aberle, 1982). NAC ceremonies can also be held for questions of guidance and prayer, and sometimes ceremonies are held in hopes of deciding whether a person should be treated using traditional or Occidental medicine. 'They hope that someone in the meeting will have an insight as to what should be done' (Aberle, 1982, p. 125). As I argue in this article, the expansion in consciousness occurs

through greater access to new or little-used cognitive structures and mechanisms, allowing the individual to gain insights into questions posed during the ceremony and to develop their own needs-based solutions.

Finally, it is important to mention the occurrence of visions in NAC ceremonies, primarily because Euro-Americans often fixate on this point as one of the reasons for classifying peyote as a Schedule I controlled substance. Although it is true that one of the reasons for eating peyote is to induce visions, it is important to contextualize the place of visions within the NAC ceremony. Visions have great significance to most Native Americans, for they 'provide foreknowledge and defensive powers' (Brito, 1989, p. 168). Visions are also necessary in some tribes if one aspires to become a successful medicine person, and they are never thought of as simply hallucinations. In fact, for most Native Americans, visions are considered a direct form of communion with the non-physical, and are welcomed as an integral part of both their spiritual and their everyday reality. Because Native Americans consider spirits and other non-physical entities part of ontological reality, visions of or from these entities are not deviant or unhealthy mental phenomena. 'Individuals claim they experience inspiration, protection, power, prophecy, and salvation. For peyotists, the physiological effects of peyote seem to satisfy their emotional needs and desires, and provide a powerful religious experience' (Anderson, 1996, p. 62). Visions, therefore, are an integral aspect of NAC ceremonies, but they are not required or essential for ceremonies to have a positive outcome.

NAC members claim that peyote is the spirit of God, not simply a psychoactive biochemical agent. Likewise, the hallucinogenic effects of peyote are not the driving reason behind ingesting the sacrament. Instead, peyote allows NAC members to heal either personal, social, and communal problems through expanded access to their consciousness.

Psychopharmacology of Peyote

As has been discussed, the use of peyote is an essential part of the NAC ceremony and theology. NAC members view peyote as a powerful and sacred spirit in and of itself, and not merely as a drug that produces visual hallucinations. In this section of the article I discuss the psychopharmacological effects of peyote on the brain and nervous system, and how these effects provide a mechanism permitting the individual to access cognitive structures and mechanisms in their brain that expand their consciousness.

The peyote cactus contains more than 55 alkaloids and related compounds, many of which have direct effects on human physiology and brain neurochemistry. However, only a few of these alkaloids have been studied to determine their psychopharmacological affects on the human individual. Of the 55-plus alkaloids, seven have been studied in some detail and are believed to be the main active alkaloids that affect the human body when peyote is consumed: lophophorine, anhalodine, anhalonidine, anhalonine, hordenine, pelletine, and mescaline. Although each peyote cactus contains all of these alkaloids, it is important to note that no two plants contain the exact same ratio of alkaloids, explaining why members report unique phenomenological experiences each

time they take the sacrament. Furthermore, because the psychopharmacological effects described below come from clinical lab studies using isolated chemical/alkaloid ingredients, generally on non-human subjects, a full understanding of the synergistic effects of peyote on the individual is unknown.

Physiologically, lophophorine acts as a toxin that causes violent tetanic convulsions when taken in doses of about 12mg per kilogram of body weight. Its action is similar to that of strychnine. Smaller doses are phenomenologically reported to cause a sickening feeling in the back of the head, a slight decrease in pulse rate, and a hotness and blushing of the face (Kapadia & Highet, 1968). Little is known about lophophorine's psychological effects.

Anhalodine appears to be a stimulant of the central nervous system similar to lophophorine and pelletine (see below), though it is physiologically less potent. Studies conducted on frogs show that anhalonine and anhalonidine produce a state of narcosis followed by a phase of excitability, although large doses produce complete temporary paralysis. Hordenine is an alkaloid that is found in many common plants (such as barley), as well as many other hallucinogenic substances. Hordenine has a physiological effect on the heart muscle similar to that of ephedrine, and it also causes paralysis of the central nervous system. Hypertension and an accelerated pulse result from large doses, while very large doses can result in death through the cessation of respiration (Goelz, Rothenbacher, Wiggins, Kendall, & Hershberger, 1980). The psychological effects of these alkaloids are not well known, although it is generally presumed that the physiological effects have some psychological consequences.

In small doses of about 8–10mg, pelletine produces tetanic-like convulsions in frogs. Subcutaneous dosages of about 50mg result in a feeling of drowsiness and a psychological disinclination for all physical or mental effort in humans. Physiologically, it also causes a slowing of the heartbeat and a decrease in blood pressure (Baker & Taylor, 1997). Finally, some pharmacologists have considered pelletine to have powerful psychological consequences such as the induction of hypnotic effects (Anderson, 1996).

Mescaline (3,4,5-trimethoxyphenylethylamine) is considered by many pharmacologists to be the main psychologically active alkaloid in peyote, and it has been extensively studied compared to the other alkaloids. Mescaline is believed to affect the action of serotonin, one of the main neurotransmitters within the central nervous system. This hypothesis accommodates the wide array of physiological effects that mescaline has been reported to produce, of which the 16 most common are: a slight increase in blood pressure and pulse rate—however, changes in blood pressure are not necessarily correlated with dosage levels; a strong increase in patellar reflex, especially with doses above 150mg; mydriasis or excessive dilation of the pupils; postural instability and problems with walking; a general increase in motor activity exemplified by fidgeting and restlessness; immediate and continual perspiring; an increase in the frequency and amplitude of respiration, often leading to rapid breathing; a lowered body temperature for about the first four hours, followed by an increase and moderately high body temperature; a rapid rise in blood sugar for the first hour, followed by a return to the initial level in the subsequent two to four hours; a consistent decrease in blood potassium levels, reaching its lowest point in 30–60 minutes; an increase in urinary excretion and often a strong

desire to defecate; a marked increase in the production of leucocytes, reaching a peak in two to four hours, followed by a slow decline to the initial level; sensations of both hot and cold; a flushing of the skin, often accompanied by shivering and chills with goose pimples; an increase in salivation; and a flattening of the neurooscillatory waves and a general blocking of the alpha rhythm on electroencephalograms.

These physiological effects, as well as the accompanying psychological effects (described below), may be induced in individuals with an oral dose of 5mg of mescaline per kilogram of body weight (Aghajanian & Marek, 1999; Anderson, 1996; Davis, 1987; McCall, 1982, 1986).

We have only recently begun to understand the direct psychological actions of mescaline, unlike the physiological effects. For example, evidence indicates that mescaline has a simultaneous action at both serotonin and dopamine receptors (Trulson, Crisp, & Henderson, 1983). Specifically, it appears that 5-HT_{2A} receptors (one of the serotonin receptor subtypes) are particularly important in the expression of mescaline (Appel & Callahan, 1989). This is supported by the apparent correlation between the 5-HT_{2A} binding affinities of mescaline and 'both hallucinogenic potency in humans and discriminative stimulus (i.e., subjective) properties in animals' (Appel & Callahan, 1989, p. 41). Reports that putatively selective 5-HT_{2A} antagonists such as ketanserin, pirenperone, and ritanserin block the discriminative properties of mescaline (Davis, 1987; Niemegeers, Colpaert, Leysen, Awouters, & Janssen, 1983) further strengthen this conclusion.

Furthermore, other research indicates that mescaline also inhibits cholinergic neuromuscular transmission by blocking the presynaptic release of acetylcholine (ACh) (Ghansah, Kopsombut, Maleque, & Brossi, 1993). ACh receptor sites can be either ionotropic (nicotinic receptor) or metabotropic (muscarinic receptor), which makes it possible for acetylcholine to produce either an inhibitory or an excitatory response. The nucleus basalis of the brain is the major source of acetylcholine, and it has been shown that projections from the nucleus basalis provide the primary source of neocortical acetylcholine (Lehmann, Nagy, Atmadia, & Fibiger, 1980; Mesulam & Van Hoesen, 1976). There are also cholinergic projections from the adjacent medial septum and diagonal band of Broca's area to the hippocampus (Squire, 1987). These cholinergic projections produce much of the acetylcholine in the brain.

ACh's psychological effects are not clear, although it has been hypothesized that cholinergic synapses are sites used in the storage of memories and the binding of information in the brain, primarily because most of the ACh in the neocortex originates in the basal forebrain. However, Squire (1987) believes that these cholinergic pathways are better suited for some type of cognitive modulator role, because cholinergic pathways are ascending and widely projecting, rather than as an information-containing, information-storing system. Therefore, mescaline may have some effect on the binding of or access to memories and information, through its inhibition of the release of ACh, although in what way and for how long is still unclear.

Likewise, mescaline psychologically activates afferent inputs, which subsequently affects the locus coeruleus (Aghajanian & Marek, 1999). The locus coeruleus consists of two dense clusters of noradrenergic neurons that receive an 'extraordinarily widespread

convergence of sensory information, both somatosensory and visceral, relaying this information to virtually all other parts of the neuraxis, including the cerebral cortex' (Aghajanian & Marek, 1999, p. 18S). Thus, not only does mescaline have neurophysiological effects on the release and reuptake of serotonin and dopamine, but it also appears to have access-mediating effects on the flow of information to the cerebral cortex. Thus, when an individual ingests peyote, the various alkaloids within the cactus induce both physiological and psychological effects in the individual—effects which expand an individual's access to parts of their consciousness.

Another area that has been studied concerning mescaline concerns hemispheric-specific activation. For example, it appears that mescaline activates the right hemisphere of the brain. 'Our combined results point to a covariation of heightened striato-limbic metabolic activity in the right hemisphere with deterioration of right hemisphere performance on the face test during mescaline-induced psychosis' (Oepen, Fuenfgeld, Harrington, Hermle, & Botsch, 1989, p. 334). That is, evidence indicates that mescaline has activation-specific effects on the right hemisphere that may account for the reported effects of increased creativity, understanding, and visualization during NAC meetings.

Based on the neurophysiological and psychopharmacological data, it appears that mescaline, and more appropriately peyote with its 55-plus alkaloids, has an incredible effect on the consumer. The evidence indicates that peyote acts upon the consumer's serotonin receptors, locus coeruleus, and right hemisphere. The combined result is that NAC members are able to access new or little-used cognitive structures and mechanisms that expand their consciousness, allowing them to heal various physical, mental, and spiritual ills and to create need-based solutions to various problems.

Legal Issues Concerning Peyote Use

For the purposes of this article, it is not necessary to cover the legal ground and legal history surrounding the use of peyote by Native Americans. However, it is important to note that the use of peyote by Native Americans is legal under 21 CFR 1307.31. Furthermore, the American Indian Religious Freedom Act of 1978 (AIRFA), which was reenacted by Congress in 1991, supports NAC members' use of peyote. This piece of legislation preserves 'the sacramental use of peyote by traditional Native American religious practitioners by exempting members of federally recognized Indian tribes from the state and federal provisions prohibiting peyote possession and use' (Parker, 2001, p. 90).

These regulatory exemptions extend only to those engaged in 'bona fide religious ceremonies of the Native American Church.' Non-Native Americans have often used the language of these exemptions, which mention no tribal membership, to bolster the argument that they, as members of the NAC, are allowed to use peyote. In response, the government has argued that the regulation should be interpreted to require the NAC member to have Native American ancestry. In *United States v. Boyll*, a federal district court in New Mexico found that the government's interpretation ran afoul of the plain language of the exemption. The court in *Boyll* also found that the government's proposed interpretation would violate the Free Exercise Clause of the U.S. Constitution

by imposing a racial exclusion on church membership (Parker, 2001, pp. 94–95). However, the court also cited AIRFA in rendering its decision, which established what is known as a bright-line rule: if one belonged to a federally recognized Native American tribe, one was exempt from federal controlled substance provisions, making peyote use and possession legal for NAC members.

Conclusion

The sacramental ingestion of peyote by members of the NAC expands access to new or rarely used cognitive structures and mechanisms within individuals' consciousness. Expanded access to these cognitive features allows NAC members to heal physical, mental, and spiritual imbalances, as well as imbalances within the individual's social relations. Because many of these imbalances stem from the power-based historical social arrangements of the reservation system, the NAC and its use of peyote represents an indigenous needs-based solution. During a time of great social and cultural upheaval, Native Americans were able to recognize the power of peyote in expanding access to parts of their consciousness, which enabled them to develop their own needs-based solutions. These solutions continue to be effective in the present day, and continue to help Native Americans work towards indigenous forms of individual and social justice.

In helping to foster social justice among indigenous peoples, we should turn first towards indigenous-based solutions. As indigenous peoples throughout the world have grappled with power-based historical arrangements resulting from colonial forces, they have been forced to develop their own solutions that met their needs. These needs-based solutions often do not take a form recognizable to Euro-Americans, as in the case of the NAC and the sacramental use of peyote. However, that does not discount their validity or their power. Most probably, other indigenous peoples have developed similar means of generating their own needs-based solutions. As NAC members expand access to their consciousness, so perhaps should we, expanding our consciousness so that we are able to recognize indigenous needs-based solutions.

Note

- [1] This cultural lifeway was centered around a seasonal resource exploitation pattern, a pattern that was completely disrupted when Native Americans were forced onto reservations on a year-round basis.

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