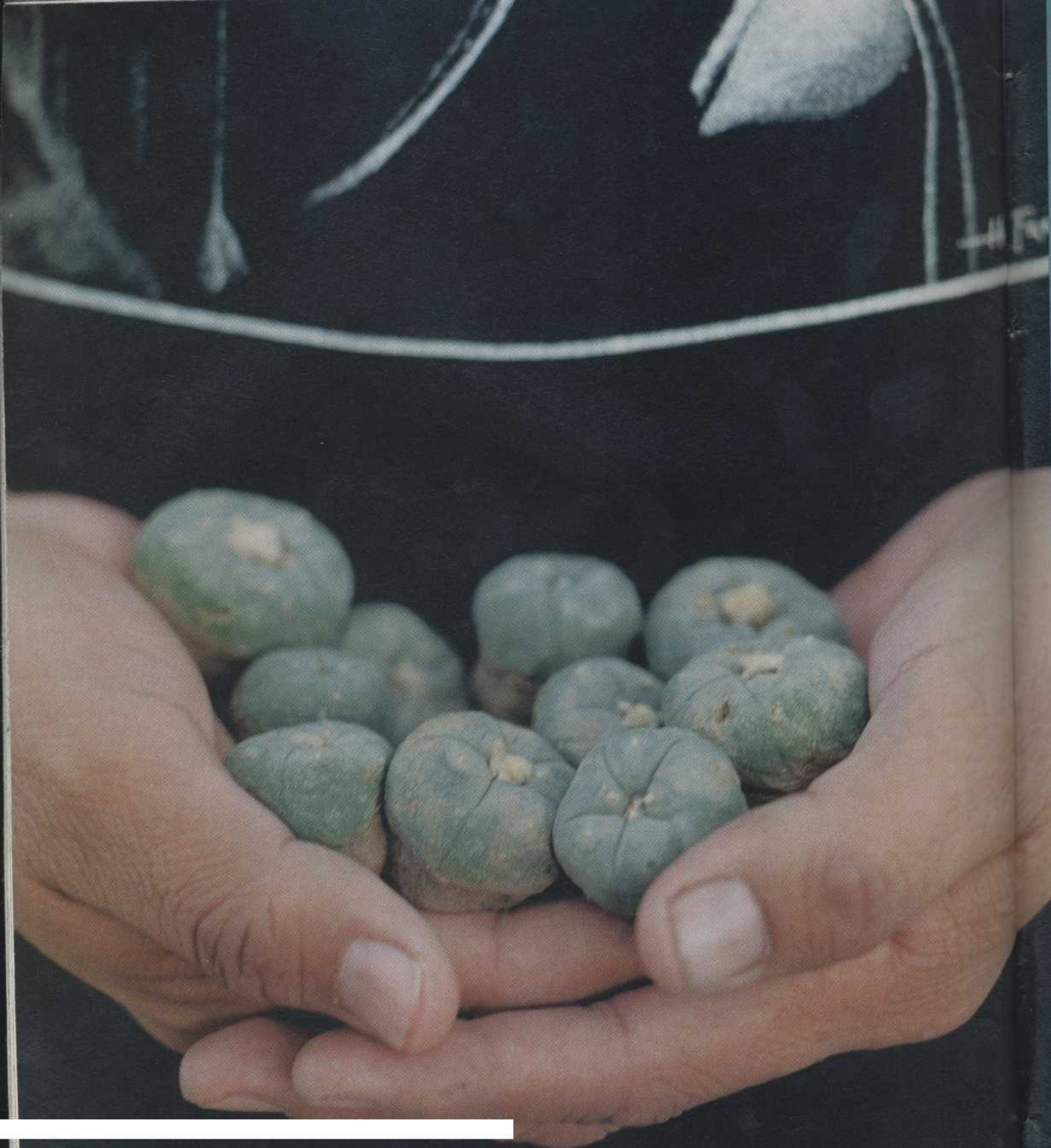
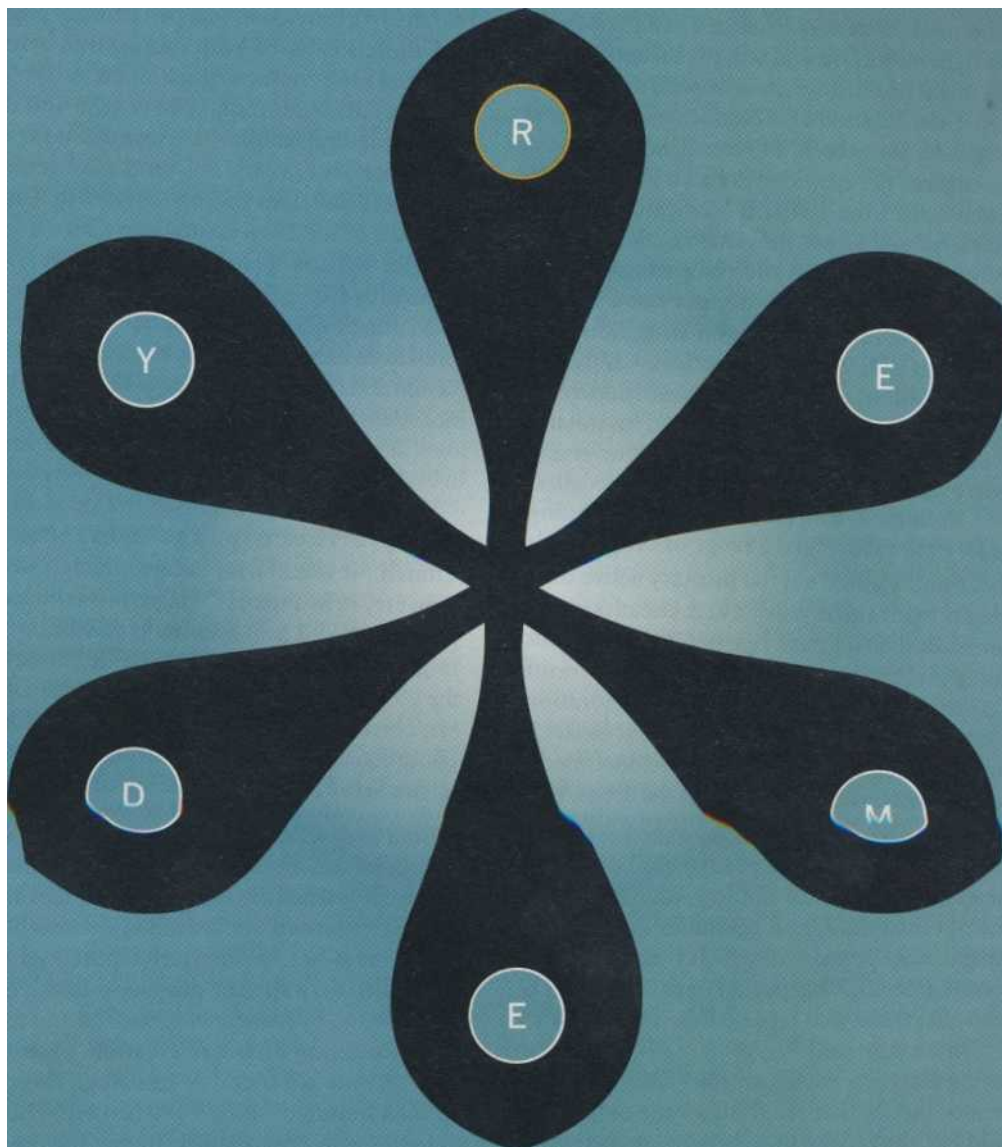




Peyote is a hallucinogen considered sacred medicine by members of the Native American Church. It was formally legalized for church members in 1994 as an amendment to the American Indian Religious Freedom Act. Buttons harvested from peyote cacti are purchased from licensed dealers in southern Texas.

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locked up in hallucinogenic drug



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EVEN WITH SEVERAL TABLESPOONS OF PEYOTE IN ME, BY 3 in the morning I'm fading. For almost six hours I have been sitting in a tepee in the Navajo Nation, the largest Indian reservation in the United States, with 20 Navajo men, women, and children. They belong to the Native American Church, which has 250,000 members nationwide. Everyone except the four children has eaten

the ground-up tops, or buttons, of peyote, *Lophophora* wifGam-sii. U.S. law classifies the squat cactus and its primary active ingredient, mescaline, as Schedule 1 substances, illegal to sell, possess, or ingest. The law exempts members of the Native American Church, who revere peyote as a sacred medicine. 5 A barrel-chested man wearing a checked shirt and cowboy boots stands

over the cedarwood fire and murmurs a prayer in Dine, the Navajo language. As this roadman, or leader of the service, sprinkles sage on the coals, my eyelids close. I smell the sage and hear it hiss, and I see the roiling geometric patterns, called form constants, generated by compounds such as mescaline. Then the balding white man on my right nudges me and tells me to keep my eyes open. The Navajo might be offended, he whispers, if they think I have fallen asleep. Later, he shakes his head when I lean on an elbow to relieve the ache in my back. Too casual, he says.

My guide to the etiquette of peyote ceremonies is John Halpern, a 34-year-old psychiatrist from Harvard Medical School. For five years he has been coming here to the Navajo Nation-27,000 square miles of sage-speckled desert stretching from northern Arizona into New Mexico and Utah-to carry out a study of peyote. Funded by the National Institute on Drug Abuse, the study probes members of the Native American Church for deficits in memory and other cognitive functions. Halpern has brought me here to help me understand him and his mission, which is to provoke a reconsideration of the pros and cons of hallucinogenic drugs, commonly referred to as psychedelics.

Coinced in 1956 from the Greek roots for "mind revealing," the term *psychedelic* refers to a broad range of drugs that include peyote, LSD, and psilocybin, the primary active ingredient in so-called magic mushrooms. Three decades ago the federal government shut down most research on psychedelics, and *The Journal of the American Medical Association* warned that they can cause permanent "personality deterioration," even in previously healthy users. Halpern says this blanket indictment is "alarmist" but agrees that there are documented dangers associated with the recreational use of the drugs. When ingested recklessly in large doses, psychedelics can generate harrowing short-term experiences, and they can precipitate long-term psychopathology in those predisposed to mental illness. Nonetheless, more than 20 million Americans have tried a psychedelic at least once, and 1.3 million are users of the drugs, by far the most popular of which is now MDMA, or Ecstasy. Halpern undertook his peyote research in part to test persistent fears that those who repeatedly use psychedelics run a high risk of brain damage.

While recognizing that psychedelics are toxic substances that should not be treated lightly, Halpern thinks some of the drug compounds could have beneficial uses. "There are medicines here," he says, that could prove to be "fundamentally valuable." He hopes the mind-revealing power of psychedelics can be bar-

nassed to help alleviate the pain and suffering caused by two deadly diseases that have long been notoriously resistant to treatment: alcoholism and addiction. More than 12 million Americans abuse alcohol, and another 1 million abuse cocaine or heroin.

Halpern's conviction that psychedelics might help alcoholics and addicts is based both on research by others and on his personal observations of members of the Native American Church. Although Indians in central and northern Mexico, peyote's natural habitat, have ingested it for spiritual purposes for thousands of years, only in the last century did this practice spread to tribes throughout North America in the form of rituals of the Native American Church.

All the subjects of Halpern's research are Navajo, who account for roughly 10 percent of the church's membership and hold key leadership positions. Even though tribal leaders have banned alcohol from their reservation, alcoholism is still rampant. For the Navajo and other tribes, rates of alcoholism are estimated to be more than twice the national average. Those in the Native American Church say their medicine helps keep them sober and healthy in body and mind, and Halpern suspects they are right.

He first took peyote himself five years ago, shortly after presenting his research plan to leaders of the Native American Church. "It would have been supremely insulting to them if I didn't try it. So I tried it." Halpern also hoped that firsthand experience would help him understand how peyote ceremonies might benefit church members. He checked beforehand with the U.S. Drug Enforcement Agency, which told him that it would not object to peyote use by non-Indians for serious scientific, educational, or journalistic purposes. Halpern has participated in five services in all, including the one we both attend, and these experiences have imbued him with respect for the Indians and their faith. When I expressed curiosity about the ceremonies, he said the best way to appreciate them is to participate in one. He warned me that the ceremonies are in no way recreational or fun, and our session in Arizona bears that out.

Like most Native American Church services, this one has been called for a specific purpose-in this case, to help a wife and husband burdened with medical and financial problems, all too common on the reservation. Except for Halpern and me, everyone is a friend or relative of this couple; some have traveled hundreds of miles to be here. The meeting lasts for 10 hours with only a single 10-minute break, and it unfolds in a rhythm of rituals: smoking tobacco rolled in corn husks; singing hymns in Dine or other Native American languages

EXPERIMENTS WITH PEQP

John Halpern's peyote study is part of a revival of psychedelic research. At least a half dozen prominent researchers are exploring the potential of using hallucinogens, including:

Francisco Moreno, a psychiatrist at the University of Arizona College of Medicine in Tucson, administers psilocybin, the primary active ingredient of hallucinogenic mushrooms such as *Psilocybe semilanceata*, to 10 patients as an experimental treatment for obsessive-compulsive disorder.

* Pedro Sopolana Rodriguez, a psychiatrist at the Psychiatric Hospital of Madrid in Spain, gives MDMA, or Ecstasy, to 29 women suffering from post-traumatic stress disorder caused by sexual abuse.
 :: Evgeny Krupitsky, a psychiatrist at the St. Petersburg Scientific Research Center of Addic-



Mushrooms such as *Psilocybe semilanceata* reportedly ease symptoms of obsessive-compulsive disorder.



One early advocate of psychedelic therapy was William Wilson, who founded Alcoholics Anonymous



to the pounding of a deerskin drum; eating peyote and drinking peyote tea passed around in bowls, three times in all.

There is a spellbinding beauty in the incantations of the roadman, in the sparks spiraling up from the bed of coals toward the tepee's soot-blackened roof, in the stoic expression of the elder who adds cedar logs to the fire and rakes the coals into a half circle. But none of the worshippers seems lost in blissful aesthetic reveries. Far from it. For much of the night, the mood is solemn, even anguished. Two people vomit, including the wife. Both she and her husband sob as they confess their fears and yearnings. So do others as they listen, offer prayers, or divulge their own troubles—usually in Dine, but occasionally in English.

The power of these ceremonies, Halpern tells me later, is only partly pharmacological. After all, worshippers usually eat just a few tablespoons of peyote, which amounts to less than 100 milligrams of mescaline—enough to induce a stimulant effect but not full-fledged visions. Peyote, Halpern speculates, serves primarily as an amplifier of emotions aroused by the ceremony's religious and communal elements. He cannot prove this conjecture yet, nor can he say how or if the putative benefits of these sessions might be achieved by non-Indians in more conventional psychotherapeutic settings. "A lot more work needs to be done to answer such questions," he says.

His creeping baldness notwithstanding, Halpern looks younger than his age. He can be brash too. During our weekend in Navajo country—where we visit a substance-abuse clinic and meet a Native American Church leader as well as attend the peyote session—he exults in displaying his knowledge of psychedelic chemistry and his talent for mimicry. A nightclub owner once said his impressions were good enough for a stage act, he boasts. (Actually he is good, especially at obscure sitcom characters like Colonel Klink's irritable commander in *Hogan's Heroes*: "Kleenk, you EE-dee-ot!")

Halpern says he does have "an abrasive, sarcastic side." But he also has an earnest, idealistic side that comes to the fore when he talks about his upbringing. Raised in a Jewish home in an affluent New York suburb, he was never particularly religious, but he inherited a passion for healing from his psychiatrist father and psychologist mother. They convinced him that "medicine is the highest profession you can have, because it's such a

privilege to work with human beings and to heal them."

He traces his interest in psychedelics to the early 1990s. Interning at a psychiatric hospital in Brooklyn, New York, he became frustrated that he could not offer better treatments for alcoholic or drug-addicted patients. During a weekend at his parents' home, he vented to a visiting family friend, Chunial Roy, an Indian-born psychiatrist who had settled in western Canada. Roy recalled that in the 1950s, he did a survey of alcoholism among Indians in British Columbia and found low rates among members of the Native American Church. Roy added that psychedelics such as LSD had once been considered promising treatments for addiction and other disorders.

"I was so fascinated that I did all this research," says Halpern, who had never taken psychedelics and knew little of their history. He learned that LSD, mescaline, and psilocybin, initially viewed as mimickers of the symptoms of mental illness, came to be seen as potential treatments. From 1950 to the mid-1960s, journals published more than 1,000 papers describing the treatment with psychedelics of 40,000 patients afflicted with alcoholism and various other disorders.

One early advocate of psychedelic therapy was William Wilson, known more familiarly as Bill W., who founded Alcoholics Anonymous in 1935. After observing alcoholics undergoing LSD treatment and taking the drug himself in 1956, Wilson became convinced that it might benefit alcoholics by triggering religious experiences like the one that had helped him stop drinking. The studies that instilled these hopes in Wilson and others were largely anecdotal, lacking controls, or flawed; they were nonetheless suggestive enough, Halpern thought, to merit follow-up investigations.

After Halpern began his residency training at Harvard Medical School in 1996, he found a mentor: Harrison G. Pope Jr., a professor of psychiatry who had investigated marijuana and other psychotropic drugs. Halpern and Pope have coauthored several papers, notably one that considers whether hallucinogens cause permanent neurocognitive damage, as some early critics claimed. "At present," they wrote, "the literature tentatively suggests that there are few, if any, long-term neuropsychological deficits attributable to hallucinogen use." They contended that most studies linking psychedelics to neurocognitive toxicity examined too few subjects and did not control adequately for pre-existing mental illness or for consumption of other, more toxic substances, such as amphetamines and alcohol.

It was to help resolve this lingering controversy that Halpern and Pope decided to examine the Native American Church, which offered a large population that consumes a psychedelic substance while avoiding other drugs and alcohol. Halpern and Pope won grants for their project not only from the National Institute on Drug Abuse but also from Harvard Medical School and two private foundations that support research on psychedelics: the Multidisciplinary Association for Psychedelic Studies and the Heffter Research Institute (named after the German chemist who isolated mescaline from peyote

tions and Psychopharmacology in Russia, treats alcoholics and heroin addicts with ketamine, an anesthetic that at sub-anesthetic doses produces out-of-body experiences. Krupitsky has reported positive results in his clinic and at the Yale/West Haven VA Medical Center in Connecticut.

Deborah Mash, a neurologist at the University of Miami School of Medicine who also works at a clinic in St. Kitts, West Indies, treats opiate and cocaine addicts with ibogaine, an extract of the West African shrub *Tabernanthe iboga*.

Charles Grob, a psychiatrist at the Harbor-UCLA Medical Center in Torrance, California, plans to offer psilocybin to late-stage cancer patients as an experimental treatment for pain, anxiety, and depression.



Halpern found tentative evidence that psychedelics as a

and discovered its psychoactive properties in the late 1800s).

Obtaining the cooperation of Native American Church officials turned out to be more difficult. Many disliked the idea of having their faith scrutinized by a scientist, especially a white one. After Halpern gave his pitch to one church gathering, a tribal elder harangued the crowd in Navajo for 20 minutes. Finally he turned to Halpern and, angrily evoking the specter of Christopher Columbus, exclaimed: "1492!" Another difficult moment came during his first peyote session. The roadman kept insisting that Halpern take more peyote, until finally he vomited. Halpern felt that the roadman's implicit message was, "You want to learn about peyote? I'll teach you about peyote."

Halpern persisted, coming to meetings bearing gifts of sweet grass and flat cedar, aromatic herbs prized by Indians. "I was

trying to show I took the trouble to learn something about their culture." He trolled for volunteers for his research by putting up ads in Laundromats and handing out flyers at a flea market in Gallup, New Mexico. (The \$100 promised to those who completed the study helped too.)

One church leader who persuaded others in the flock to trust Halpern was Victor J. Clyde, vice president of the Native American Church of North America and an elected state judge. During our trip to the Navajo Nation, Halpern and I visited Clyde in Lukachukai, Arizona, where he lives with his wife and three children. Clyde is compact and broad-shouldered, and he speaks with the tough self-assurance of a former prosecutor.

When I asked what the Native American Church stands to gain from Halpern's work, Clyde replied that scientific evidence of peyote's safety should protect church members. Just last year, the Pentagon cited concerns about "flashbacks"-recurrences of a psychedelic's effects long after it has vanished from the body-in barring servicemen in the Native American Church from sensitive nuclear assignments. Didn't Clyde ever worry that Halpern's research might turn up harmful effects? Clyde eyed me momentarily before responding to my question. If peyote was harmful, he said firmly, his people would have noticed by now.

Clyde's belief that peyote does not harm church members has been corroborated by Halpern's research. He estimates that he spoke to 1,000 Navajo before finding 210 who met his criteria. The subjects fall into three categories: Roughly one-third have taken peyote at least 100 times but have minimal exposure to other drugs or alcohol; one-third are not church members and have consumed little or no alcohol or drugs; and one-third are former alcoholics who have been sober for at least three months.

Halpern and several research assistants administered a battery of tests—of memory, IQ, reading ability, and other cognitive skills—to the three groups. According to preliminary data that he has presented at conferences, church members show no deficits compared with sober nonmembers and score significantly better than the former alcoholics. Church members also report no flashbacks. With his coauthor Pope, Halpern plans to publish his full results in a peer-reviewed journal this summer, after presenting them to church leaders and Navajo health officials.

Halpern is already anticipating objections to his research—for example, that its significance applies only to one substance



John Halpern, a research psychiatrist at Harvard, says he suspects that psychedelic compounds such as LSD, psilocybin, and mescaline stimulate "a center in the brain that is involved in spirituality."

class reduce addicts' craving during a post-trip 'afterglow'



used by one ethnic group. "You could in one sense say mescaline is not the same as all these other compounds," he says. His study nonetheless indicates that psychedelics as a class may not "burn out" the brain. "If we find this group of people that, with these special conditions, aren't having problems, that does have some relevance for the population at large."

Halpern also realizes that he may be accused of going native, of becoming so close to his subjects that his objectivity has been compromised. To reduce the risk of bias, he and Pope designed the study to be blind; those who scored the tests given to the Navajo did not know to which group each subject belonged. Moreover, Halpern did not participate in peyote ceremonies with any of his research subjects.

Perhaps the biggest weakness of his and Pope's research, Halpern acknowledges, is that its design precluded testing to see whether peyote reduces the risk of alcoholism. Halpern would like to see that issue addressed in a follow-up study. An ideal partner for a trial could be the Na'nizhoozhi Center, a substance-abuse clinic in Gallup whose clientele is almost entirely Native American. The center, founded a decade ago, offers conventional therapies and self-help programs, such as Alcoholics Anonymous, as well as various traditional Indian healing ceremonies. These take place in a yard behind the clinic that is large enough for several of the octagonal log cabins known as hogans, sweat lodges, and a tepee for Native American Church sessions. Although peyote is not given to patients during on-site church sessions, staff members encourage some clients to participate in regular peyote ceremonies once they leave the clinic.

The clinic's records indicate that those who participate in Indian healing ceremonies fare better than those who have participated in Alcoholics Anonymous. Halpern hopes that someday the clinic, perhaps with his help, will rigorously compare the relapse rates of patients who participate in peyote ceremonies versus other treatments. Ideally, to distinguish the effects of peyote per se from those of the ceremony and of church membership, one group of alcoholics could receive peyote in a non-religious setting; another group could receive a placebo.

Halpern would never recommend such a protocol, however, because it would violate precepts of the Native American Church. "Peyote taken the wrong way, they believe, is harmful," he explains. Out of respect for the church, Halpern would never advocate testing peyote's effects on non-Indians, either. In this respect, he acknowledges, his affection for church members does influence his role as a researcher.

But there are many other compounds that can be explored as potential treatments for non-Indians. In a 1996 paper, Halpern reviewed scores of studies of the treatment of substance abuse with psychedelics and found tentative evidence that they reduce addicts' craving during a post-trip "afterglow" lasting a month or two. This effect might be at least partially biochemical; LSD, mescaline, and psilocybin are known to modulate neurotransmitters such as serotonin and dopamine, which play a crucial role in the regulation of pleasure.

One possible candidate for psychedelic therapy would be

dimethyltryptamine, or DMT, the only psychedelic known to occur naturally in trace amounts in human blood and brain tissue. DMT is the primary active ingredient of ayahuasca, a tea made from two Amazonian plants. Like peyote, ayahuasca has been used for centuries by Indians and now serves as a legal sacrament for several Brazilian churches. Recent studies of Brazilian ayahuasca drinkers by Charles Grob, a psychiatrist at the Harbor-UCLA Medical Center, and others suggest that ayahuasca has no adverse neurocognitive effects. An advantage of DMT, Halpern says, is that when injected its effects last less than an hour, and so it could be incorporated into relatively short therapeutic sessions.

Halpern already has research experience with DMT. In 1994 he spent six weeks helping Rick Strassman, a psychiatrist at the University of New Mexico, inject DMT into volunteers to measure the drug's physiological effects. That study showed that DMT is not necessarily benign. Twenty-five of Strassman's 60 subjects underwent what Strassman defined as "adverse effects," ranging from hallucinations of terrifying "aliens" to, in one case, a dangerous spike in blood pressure. Strassman's concerns about these reactions contributed to his decision to end his study early.

An even more controversial candidate for clinical testing is 3,4-methylenedioxymethamphetamine, more commonly known as MDMA or Ecstasy. MDMA is sometimes called an empathogen rather than a psychedelic, because its most striking effects are amplified feelings of empathy and diminished anxiety. Advocates contend that MDMA has therapeutic potential, and several researchers around the world are now administering the drug to patients with post-traumatic stress and other disorders.

Critics point out that MDMA has rapidly become a drug of abuse, with almost 800,000 Americans believed to be users. The drug has been linked to fatal overdoses and brain damage; just last fall, a paper in *Science* reported that only a few doses of MDMA caused neuropathy in monkeys. To help resolve questions about MDMA's safety, Halpern and Pope have begun a study of young Midwesterners who claim to take MDMA while shunning other drugs and alcohol.

All drugs pose certain risks, Halpern says. The question is whether the risks are outweighed by the potential benefits for a population. For example, the benefits of giving MDMA to terminal cancer patients to help them cope with their anxiety might outweigh the risks posed to their health. In the same way, DMT or some other psychedelic might be worth giving to alcoholics and addicts who have failed to respond to other treatments.

Halpern also hopes to conduct a brain-imaging study to test his hypothesis that psychedelics reduce craving in addicts by affecting their serotonin and dopamine systems. "It sounds reductionistic," he says, "but a picture can be worth a thousand words." An ideal collaborator would be Franz Vollenweider, a psychiatrist at the University of Zurich, who with positron-emission tomography has measured neural changes induced in healthy volunteers by psilocybin and MDMA.

Some psychedelic effects have already been explained in relatively straightforward neural terms. For example, human



'if you take it by yourself, you may have important insights, but you've lost this other opportunity to learn and grow'



brain-imaging tests and experiments on animals have shown that mescaline, LSD, and other psychedelics boost the random discharge of neurons in the visual cortex. This neural excitation is thought to induce form constants, the dynamic patterns I saw when I closed my eyes under the influence of peyote, which are also generated by migraines, epileptic seizures, and other brain disorders. But the effects of hallucinogens will never be reducible to neurochemistry alone, Halpern emphasizes. Decades of research have confirmed the importance of "set and setting"-the prior expectations of users and the context of their experience. The same compound can evoke psychotic paranoia, psychological insight, or blissful communion, depending on whether it is consumed as a party drug in a nightclub, a medicine in a psychiatrist's office, or a sacrament in a tepee. In the same way, psychedelic treatments may produce different outcomes depending on the setting.

The long-term challenge for researchers, Halpern says, is to determine which settings can exploit the therapeutic potential of hallucinogens while reducing the risk of adverse reactions. In the 1950s and 1960s, psychedelic therapy usually involved a single patient and therapist. In many cases, Halpern believes, psychedelic therapy might work best for couples, families, and friends. "If you take it by yourself, you may have important insights," he says, "but you've lost this other opportunity to learn and grow."

People might also respond to settings and rituals designed to evoke religious sentiments. Recently various scientists, notably

Harold Koenig at Duke University, have reported finding correlations between religiosity-as reflected by church attendance and other measures-and resistance to depression. Ideally, Halpern says, therapists should be able to choose among many different settings to best serve a patient's needs. One of his favorite proverbs is, "Many paths, one mountain."

Halpern believes he has benefited from his peyote sessions, albeit in ways difficult to quantify or even describe. Borrowing the term for a compound that boosts the effect of a neurotransmitter, he speculates that peyote serves as a "humility agonist," counteracting his arrogance by instilling awe and reverence in him. He acknowledges, however, that these emotions might be less a function of the peyote than of the ceremony of the Native American Church.

Reverence is certainly evident in Halpern's bearing throughout the session we attend together. Although plagued by chronic back pain, he sits straight-backed for hour after hour on the \$5 cushion he purchased earlier that day at Wal-Mart. He intently watches every ritual, listens to every song. When the roadman asks everyone to pray for the husband and wife who are the meeting's focus, Halpern chimes in loudly.

Especially early on, the ceremony seems impenetrably foreign, but its meaning becomes more apparent as the night progresses. At one point the roadman, after offering a long prayer in Dine, turns to the husband and wife and says in English: "You must make more time in your lives for those who care about you." The rituals, I realize, are just expressions of gratitude for earth, fire, food, and other primordial elements of existence. After each of us sips from a bowl of water passed around the tepee, the roadman carefully pours some water on the dirt floor. Halpern says in my ear, "Think what water means to these desert people."

As dawn approaches, the mood throughout the tepee brightens. Everyone smiles as the husband and wife embrace and as their two children, who have been sleeping since midnight, wake up blinking and yawning. The wife, coming back into the tepee after fetching a platter of sweet rolls, jokes and laughs with a friend. As we drink coffee and eat the rolls, she thanks us for having sat through this long night with her and her family. "Thank you for letting us join you," Halpern replies, beaming at her, "and may you and your family enjoy good health."

Driving out of the Navajo Nation that afternoon, Halpern seems exhilarated, although he has not slept for 36 hours. He howls along with a CD of Native American Church chants and does imitations of Bill Clinton and several *Star Trek* characters. Outside Shiprock, New Mexico, his expression turns grim as we pass a policeman giving a sobriety test to a wobbly young man. Neither peyote nor any other medicine, Halpern realizes, can cure all those afflicted with alcoholism or addiction. "We don't have magic pills," he says drily. If his research on psychedelics yields therapies that can benefit just 10 or 15 percent of the millions struggling with these disorders, he will be more than satisfied. "I'm trying very slowly," he says, "to put all the pieces in place." EK



Peyote ceremonies on Navajo Nation lands typically take place in a tepee on a Saturday night and are followed by a communal morning feast.