

Botanical Divinities

Evidence is accumulating that plants with consciousness-altering properties have played a major role in religious experience

BY JULIE ANN MILLER

"Essentially, when all is said and done, we can only say that the mystery of the wondrous effects of teonanácatl [sacred mushroom] was reduced to the mystery of the effects of two crystalline substances—since these effects cannot be explained by science either, but can only be described."

— Albert Hofmann

Sacred mushroom. devil's herb, vine of the soul, semen of the sun — the names of these plants make it clear that they play no ordinary role in human culture. Rather than providing the mundane necessities of food, clothing and shelter, plants capable of altering consciousness, of initiating emotions and visions, have triggered wonder and fear throughout the ages and may be at the basis of religious experience.

"The hallucinogenic plants have always been and still are sacred in primitive societies. The only explanation for their unearthly effects as contrasted with the great majority of plant species is that these few psychoactive plants are the homes of spiritual forces. They are therefore the revered bases of magico-religious ceremonies," says Harvard University biologist Richard E. Schultes.

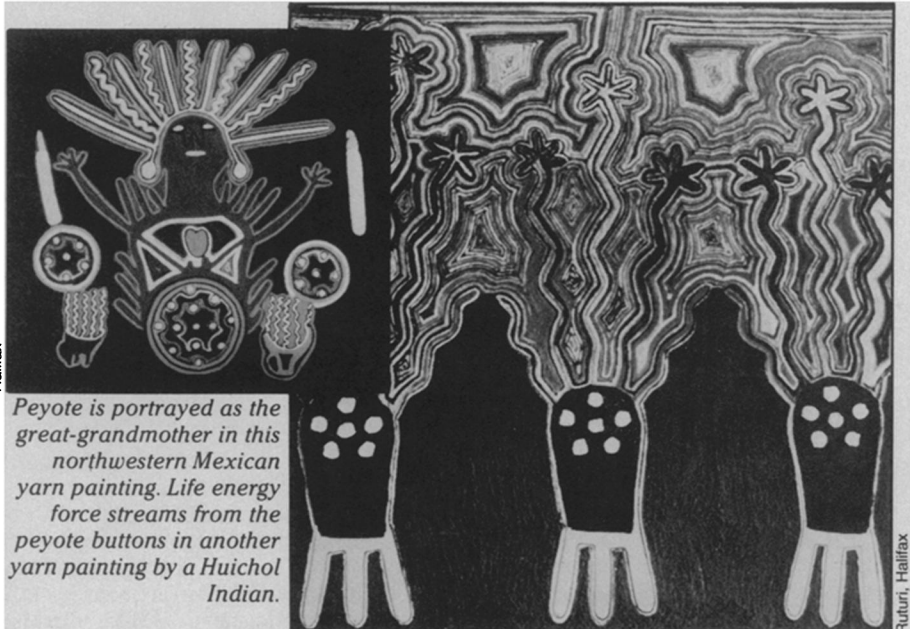
While modern popular interest in psychedelics, with accompanying use and misuse, peaked and then declined during the past decades in the United States, a small group of scientists steadfastly persevered in identifying the plants important around the world and throughout time as consciousness-altering agents and in determining the chemical natures and social roles of these plants.

The forces that continue to move those scientists — often on mule or in canoe — are curiosity about the anthropological significance of the plants and conviction that such plants will provide tools for the modern world.

"Whether they may be employed therapeutically or experimentally to help understand the complexities of function of the central nervous system, their value cannot be underestimated," Schultes said at a recent meeting at Rockefeller University in New York. "This is the legacy that we have inherited from so-called primitive societies and which we must tap before the opportunities to do so disappear." The recent creation of the JOURNAL OF



Modern shaman Don José Matsúwa, under the influence of peyote, communicates with the elements and manipulates life energy force as he officiates a ceremony.



Peyote is portrayed as the great-grandmother in this northwestern Mexican yarn painting. Life energy force streams from the peyote buttons in another yarn painting by a Huichol Indian.

ETHNOPHARMACOLOGY attests to a growing interest in exploring medical use of plants among primitive peoples (SN: 6/14/80, p. 374).

The richest areas of the world for use of hallucinogenic plants are Mexico and South America. Of 150 plants that have been found to be used as psychedelics, 130 are in the Western Hemisphere. Schultes says there is no reason to believe that the New World is in general richer in plants with psychoactive properties than the Old World. The difference appears instead to

be cultural — perhaps relating to the recent predominance of hunting societies rather than the more pastoral and agricultural life of the Old World.

"American Indian religions, based on the shamanism of hunters, still actively seek the personal mystic experience, and one of the easiest and most logical ways of seeking it is through psychoactive plants possessing supernatural forces," Schultes and Albert Hofmann say in their new book *Plants of the Gods*.

Further back in history and pre-history,

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hallucinogenic plants had a more important religious role in the Old World, investigators believe. Soma, for instance, a plant-derived inebriant introduced into ancient India, became a god in its own right. Its use was eventually discontinued and the identity of the material forgotten, although it continued to be extolled in hymns. Finally, in 1968 interdisciplinary studies indicated that the sacred narcotic was a mushroom called Fly Agaric (because it stuns or kills insects). The same mushroom was also used as an intoxicant in Siberia, North America and probably Central America.

Mushroom expert R. Gordon Wasson argues that a plant hallucinogen also served a sacred role in ancient Greece (see box). Hallucinogens were used too throughout Europe in the Middle Ages for witchcraft and for malevolent purposes.

Documentation of the use, past and present, of hallucinogenic plants has been a difficult challenge. In addition to historical descriptions and folklore, evidence comes from the remains of ancient civilizations. Statues decorated with hallucinogenic plants, curious stone figures of ecstatic or contemplative men and animals with mushroom caps, engravings of figures holding magic plants all provide leads. Knowledge is gained also from groups of people still living in cultures bound to ancient ways of life.

Schultes has spent fourteen years exploring the use of plants among natives of the Amazon region. Where he used to travel by canoe for days to reach his destinations, now he can speed in by plane. His work includes identifying plants and collecting samples, as well as documenting their uses. The hallucinogenic properties of some plants have long been recognized by investigators, but additional plants and uses are being discovered each year.

Recent studies, for example, have shown that a narcotic from trees (genus *Virola*) of the nutmeg family is used among many Indian groups in Colombia, Venezuela and Brazil. First reported at the beginning of this century, the specific identification of the drug was not achieved until 1954. In eastern Colombia, medicine men use the plant material for diagnosis and treatment of disease. Among the tribes called Waiká of Venezuela and Brazil, however, all men may take the drug.

The hallucinogenic powder is prepared in a variety of ways. Some Indians simply ingest the blood-red resin from tree bark; others follow an elaborate procedure to make snuff from the resin. In Indian mythology, the snuff derives from semen of the incestuous Father Sun. Once a year the Waiká Indians meet in large groups for a ceremony to memorialize the dead. A huge quantity of snuff is made and consumed during the ceremony. Long tubes are filled with three to six teaspoons of snuff and one person vigorously blows into the tube, sending the snuff far into the



Stylized symbols of various hallucinogenic plants decorate 16th century Aztec statue of the ecstatic Prince of Flowers.



Virola, the "semen of the sun," is a sacred inebriant in the western Amazon.

nostrils and sinuses of another. Within 3 minutes the recipient is intoxicated, becomes hyperactive and then develops a far-off look ("like a student during a Harvard exam," Schultes says). The recipient has visions of snakes and jaguars and engages the spirits. Finally he falls into a disturbed sleep riddled with nightmarish hallucinations. Upon awakening he returns to the snuff tube and begins again. The four-day ceremony demands a great expenditure of energy. Schultes emphasizes that, like many hallucinogens, *Virola* snuff is not enjoyable but instead serves a religious purpose.

So far, most of the plants identified as hallucinogens come from either the top or the bottom of the plant kingdom. Hallucinogenic fungi include ergot and various mushrooms and puffballs. Hallucinogenic flowering plants include cacti, grasses, vines, herbs, shrubs and trees.

No one yet knows why a plant should produce a hallucinogenic chemical, but one hypothesis is that the chemical, which is often toxic in large doses, protects the plant from animals. Another possibility is that the hallucinogenic substances are part of the plant's waste disposal system. Almost all the important hallucinogens

(with the exception of THC, the active ingredient in marijuana) contain nitrogen atoms. Their role, therefore, may be the elimination of excess nitrogen, a role similar to that of uric acid in animals. (Many other plants produce no such compounds.) Schultes says he finds neither explanation convincing.

Just what chemical in the witch's brew or shaman's medicine or ceremonial snuff is responsible for hallucinations? That question has drawn chemists into the investigation. With modern laboratory techniques, compounds can be identified in a few days or weeks, instead of many years. Progress in synthetic techniques allows chemists to produce sufficient quantities of rare materials for testing.

Because many of the hallucinogens do not measurably affect animals, the scientists often have had to sample material themselves to differentiate between active and inactive components. Hofmann, in his recent book *LSD, My Problem Child*, describes isolation of the active ingredient of the sacred Mexican mushroom (see box). First he ate 32 dried mushrooms, an amount corresponding to an average dose for a Mexican "wise man" or "wise woman." He reported, "At the peak of intoxication, about 1½ hours after ingestion of the mushrooms, the rush of interior pictures, mostly of abstract motifs rapidly changing in shape and color, reached such an alarming degree that I feared that I would be torn into this whirlpool of form and color and would dissolve."

Subsequently, Hofmann and colleagues used smaller quantities while testing extracts of the mushroom. "If these samples contained the active principle, they would only provoke a mild effect that impaired the ability to work for a short time, but this effect would still be so distinct that the inactive fractions and those containing the active principle could unequivocally be differentiated from one another," Hofmann says.

The most interesting finding from the chemistry is similarities between the principal plant hallucinogens and chemicals found in the normal human brain. For instance, mescaline, the active component of peyote, resembles norepinephrine. The active ingredient of the hallucinogenic Mexican mushroom, the sacred Mexican Morning Glory and ergot of rye all resemble serotonin. Both norepinephrine and serotonin are neurotransmitters, carrying signals from one nerve cell to the next. The hallucinogens probably act at the same sites in the nervous system as the natural neurotransmitters. But the details of how their action characteristically alters a person's perceptions remain to be worked out. The mystery of the mushroom (or cactus or herb or tree) already reduced to the mystery of a chemical remains intertwined with that great puzzle of modern science — the mystery of the brain. □

For books on plant hallucinogens see p. 78.