

THE NARCOTIC COMPLEX OF THE NEW WORLD

Exorbitant attention has been paid to the nature of gods, whose character it is to be inaccessible to examination, but relatively less attention has been paid to the impresarios of gods, *viz.* prophets and shamans and priests—the *de facto* sources of all our religious information—who *are* available for study. It is our contention that the nature of deities is to be sought in the psychic disposition of their exponents and, more than this, that the ancestor of the god is the shaman himself. The vatic personality is often known to be psychologically abnormal, or perhaps only temporarily in such a state as the dream or the vision, and doubtless often in response to the pressure of some current crisis, personal or social or both. But the conditions for hallucinatory contact with spirits and gods may easily be gained by psychically quite ungifted persons, through the use of psychotropic drugs. It is this second situation we would wish to examine in the present study.

Shamanism was the religion of prehistoric, as it is today of historic, hunting peoples. The distinguishing characteristic of shamanism is the "possession" of a human practitioner by the spirit or the god. Such possession may be, and often is, the

result of dissociated psychotic states in unstable personalities. But the state of possession may also result from pharmacological intoxication through various plant substances, narcotic, inebriating, or otherwise psychotropic. During the shamanistic trance, the "medicine-man" may travel to far places, visit the land of the spirits under the earth (or, among the Eskimo, deep in the sea), ascend the cosmic tree or fly into the sky, prognosticate the future, find lost objects, discover the cause of disease, etc. Shamanism is even today the religion of the "paleo-Siberian" hunting peoples of Inner Asia; and it was the substratum of all the native religions of the American Indians. In Siberia there are two types of shaman, the bird-shaman who visits the spirits in the sky and who controls the weather; and the reindeer-shaman, who visits the underworld and controls the spirits of the living and the dead. Both kinds of shaman are thus able to cure spirit-caused diseases. The sky-shaman is the precursor of European sky-gods and various other nature-deities; if the Greek gods were anthropomorphic, the reason is plain: they were once man-gods or shamans with supernatural power. The rain-kings of Africa (of which the divine king or Pharaoh is one well-known example) are human shamans, with supernatural powers over the weather and the fertility of men and animals, not unlike the "reindeer sorcerer" of the Trois Frères cave, of the Greek wealth god Dis of the underworld. The shaman Orpheus accompanied the Argonauts, as does the shaman accompany Indian war-parties. Music or magic songs constitute the divine language of all shamans. Hermes, intermediary between spirits and men, is a type of the underworld-visiting shaman, whose symbol is the chthonic snake, later used also on the wand of physicians or caduceus. Among American Indians, supernatural "power" (*orenda*, *wakan*, *manitou*) is obtained from animal familiars or guardian spirits, and this power is used in curing, in war, in witchcraft, and in divination. Metamorphosis into animals is widely believed to occur in many parts of the world; and one remembers in this connection that each Greek god has his animal or bird companion (anciently the source of his shamanistic power); and each Hindu god has his animal or bird *vahana*, or "vehicule," for Shiva the bull, Saraswati the peacock, Ganesha the rat, Varuna the elephant, etc. Among American Indians, the

shaman obtains his supernatural power or *mana* from his "vision quest," a period of four days and four nights spent fasting, alone, typically about the time of puberty; and during this vision quest his power source may appear to him. All the "tricksters" and the "gods" of aboriginal America developed out of shamanism. Spirit-possession, of course, is not only characteristic of the ancient Far East (Korean shamanesses still exist), but is also widespread in Southeast Asia, Indonesia, much of Melanesia, most of Polynesia (except for New Zealand), and Africa, as well as the New World. That possession is so widespread is a strong argument for its antiquity. But it is not only ethnographic ubiquity, it is archaeology itself that testifies to this antiquity.¹

There were shamans before there were gods. Quite apart from logical postulates of sequences by various culture-evolutionists and others—and such speculative schools of pseudo-history effectively cancel one another out—the simple fact remains that, archaeologically (*i. e.*, authentically embedded in appropriately ancient times), our first evidence of religious thinking and behavior is that of Old Stone Age hunters. From the work of Abbé Breuil and others there can now be no doubt that the prolific painting of animals in paleolithic caves was concerned with their magic increase and success in the hunt. The first religious officiant we know is the famous masked sorcerer of Trois Frères in a context that indicates a claim to magic power over the animals he represents. Further, a shaman need only be dead to be invoked as a spirit; and there is a continuous sequence, we believe, from the paleolithic masked sorcerer and the shamans who wore the deer frontlets of Mesolithic Starr Carr to the horned "god" of the Gundestrup Cauldron and the deer-horned god Cernunnus of Celtic times, represented in several excellent sculptures in the museum of St. Germaine-en-Laye.

It is important to note to what degree the very gods retain the attributes of the ancestral shamans. If one characteristic of shamans, whether rain-king in Africa or shaman-god in South America, is control over the weather, we should not be surprised that so many gods from Zeus to Jahweh should be weather-gods.

¹ Students of primitive religion will be familiar with the works of Mircea Eliade, in particular *Le chamanisme et les techniques archaïques de l'extase* (Paris, Payot, 1951), and of de Felice.

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The problem of how anthropomorphic "nature" gods got into the clouds is primarily that of tracing the evolution of the rain-shaman to sky-god. Zeus, for example, still retains many attributes of the shamanistic trickster and transforms himself into many animals (which is only what any well-regarded shaman can do); and Zeus, Dis and Neptune all retain as an attribute the trident of the ancient Eurasiatic shaman. One recalls also the use of laurel leaves by the priestesses at shrines of Apollon, and vapour issuing from clefts in the earth, as well as the use of wine, the "divine blood" of Dionysos in the Mysteries devoted to this god. This constituted the literal "enthousiasm" or possession by Dionysos. American Indian "trickster" demi-gods are even closer in nature to paleo-Siberian shamans.

Perhaps equally significant is that the gods obtain their godhood through imbibing nectar and ambrosia. "Nectar" was probably the alcoholic drink mead made from honey, but the nature of ambrosia had long puzzled scholars until the Wassons² collected evidence to suggest that ambrosia was the narcotic mushroom of ancient Eurasiatic shamanism, still in use by Siberian shamans, similar to the *teonacacatl* of the Aztec, and rediscovered in current use by Mazatec Indians of Mexico. In cultural time the aboriginal American Indian represents a Mesolithic horizon and developed almost independently of later influences from Northeast Asia, and possibly Polynesia. Because of the near-universality in America of the bow, the Indian must of course be post-Aurignacian; and the occurrence and distribution of such culture traits as the dog, pottery and the like make the American Indian (where he is not transformed locally by later independently developed agriculture, domestication, metallurgy and the like) still definitively something like a cultural fossil of the Mesolithic past.

Be that as it may, a significant fact of Americanist ethnography is the shamanistic vision, whether personal or collective in scope, as the ultimate foundation of all religious practice and belief; while equally significant, though perhaps less well known, is the extraordinary use of psychotropic, mostly plant, substances.

² Valentina P. Wasson and R. Gordon Wasson, *Mushrooms, Russia, and History*, 2 vols, New York, Pantheon Books, 1957.

Because of the basic shamanism of his religion, the American Indian is led to value the abnormal psychic state as a source of revelation and "medicine power," and this is surely not unrelated to the great variety of the psychotropic substances he does use—to such a degree that we might almost postulate a "narcotic complex" in the Americas, from the entire southern half of the United States southward through Middle America to include both Amazonia and the Andean areas.

Foremost of all psychotropic plants used in aboriginal America was, of course, tobacco. Tobacco was smoked in elbow-pipes nearly everywhere east of the Rocky Mountains in the United States and southern Canada, and again in the entire eastern half of South America; in tubular pipes and cigarettes west of the Rockies in the United States and southward continuously through Mexico and Central America to Panama; and cigars were smoked aboriginally throughout the West Indies and the western half of Amazonia. Tobacco chewing was found in South America eastward of and contiguous to the Andean region of coca-chewing, and occurred again on the Pacific coast of North America from Alaska southward to southern California. Snuff was used in both chewing areas, and additionally into Amazonia and the West Indies. And in Amazonia there was even the eating, or drinking and licking of a thick infusion of tobacco.³ The use of at least one form of tobacco, therefore, was found everywhere in the New World except in the north of Alaska and Canada, and the southern tip of South America. The significant factor, however, is that aboriginally tobacco was never used in a secular, but always in a sacred context, whether smoked in the "peace pipe" or licked from the individual spatula dipped into the tobacco infusion, to give supernatural sanction to agreements in tribal council in Amazonia. That tobacco alters the psychic state, however feebly, was enough for the American Indian to believe it had supernatural power and to use it in sacred contexts.

The ceremonial drinking of native American beers and wines (though not of distilled liquors, which were lacking aboriginally)

³ Clark Wissler, *The American Indian*, New York, Oxford University Press, 1922, pp. 25-27.

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extended from the Gila River among Yumans and Athapaskan tribes of the Southwest culture-area southward through Mexico and Central America to both the Andean and the Amazonian areas. Plant sources used include: yucca, mesquite beans, wild honey, locust pods, wild plums, *chonta* palm fruit, *Opuntia* and sahuaro cactus fruits, algarroba, *Prosopis* spp. beans, fruits of *Tizyphus mistol*, *Gourliea decorticans* and *Acacia aroma*, *cānawa* or quinoa seeds, and many others—although the chewed-maize *chicha* of the Andean area and the fermented *Agave* sap or *pulque* of Mexico (still the national drink of the peasants), together with the *cassava* beers of Amazonia are perhaps the best known. Ceremonial drunkenness was (and still is) the *sine qua non* in certain religious rites from Mexico to Amazonia, for example at the victory feasts of the Jivaro Indians when the head of an enemy has been taken, elsewhere in Brazil at death feasts, in Cora puberty rituals, and in Antillean ceremonies of all kinds. The many substances, the means of preparation, and the religious uses have been summarized,⁴ and details of Central American ritual alcoholic intoxication have been well described.⁵ With respect to New World ritual drinking, the Dionysian cult intoxication on wine is an Old World parallel. It might even be suggested that the widely prevalent alcoholism among reservation Indians, especially those of the Plains, results in part from the high value placed on abnormal psychic states in the aboriginal vision quest and the widespread use of psychotropic drugs in their earlier religious culture.

Indeed, peyotism, or the cultic eating of dried "buttons" of the *Lophophora williamsii* cactus—now nearly universal among all the Indian tribes of the Plains and beyond (extending as far westward as the Washo of Nevada-California and northward to the Cree of Canada) probably had the way prepared for it in the earlier pre-peyote "Red Bean Cult." Frequently confused with peyote, a cactus, this misnamed "mescal bean" is *Sophora secundiflora*, which contains the violent narcotic sophorine; its

⁴ Weston La Barre, "Native American Beers," *American Anthropologist*, 40 (1938) 224-234.

⁵ Ruth Bunzel, "The Role of Alcoholism in Two Central American Cultures," *Psychiatry*, 3 (1940) 361-387.

cult spread from very ancient prehistoric use among the Indians of Texas and northeastern Mexico in proto-historic times especially to Siouan groups of the Plains. Peyote contains nine psychotropic alkaloids, one of which, mescaline, produces remarkable visions in color and other sensory hallucinations. The experimental use of mescaline in producing "artificial psychoses" for research in schizophrenia, as well as the native cult use of peyote,⁶ is well known to scholars and need not be detailed here—except to point out that the production of hallucinations fits in exactly with earlier aboriginal vision quest and is the central rationale for its use.

The solanaceous genus *Datura* had several areas of aboriginal use in the Americas. In the southwestern United States (California, Arizona, and New Mexico) and in northern Mexico, *Datura meteloides* and *D. inoxia* (the *toloache* of Mexico), this violently intoxicating plant-group was used in religious and magical rites since ancient times. Various species contain hyoscyamine, scopolamine, and atropine, and the initial state of intoxication is so furious that the partaker must be restrained until a deep, disturbed sleep supervenes with visual hallucinations which are interpreted as spirit visitations. The Southwestern use is for divination, prognostication, and puberty ceremonials (the jimson weed or "Jamestown weed" of Virginia *huskinawing* or puberty ordeals may also be a *Datura* species). At least six, and perhaps seven, arboreal *Daturas* are used in the Andean region from Colombia to Chile, and were used aboriginally among the Inca and the Chibcha; in South America the uses are for the diagnosis of disease by the shaman, to discover thieves, to prophesy tribal affairs, and to correct refractory children (whose ancestors then come to admonish them). The magico-religious use of *Datura* seems to be especially well developed in Colombia. As Schultes writes,

The Indians of this isolated Valley of Sibundoy (the Kamsà and Ingano Indians of southern Colombia) may possess the most intricate narcotic consciousness of any peoples of the New World. In addition to several

⁶ Weston La Barre, *The Peyote Cult* (Yale University Publications in Anthropology, 19, 1938; 3rd enlarged edition, Hamden, Conn., Shoe String Press, 1964).

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species of tree-Daturas and *Methysticodendron*, they recognize and keep through vegetative reproduction clones of Daturas which are variously atrophied as a result of virus infection. Some of these "races" are such monstrosities that it is difficult to discover the species to which they belong. The natives have special names for each clone. Since they are reputedly stronger, weaker, or in other ways different from healthy Daturas in their effects, they are conserved for very special uses by the witch-doctors.⁷

Perhaps this is true in botanical terms; but for sheer number and variety of psychotropic drugs used ritually, the Aztec would probably be awarded the palm by ethnographers—for the Aztec had, in addition to the *peyotl* cactus, various narcotic mushrooms (*Basidiomycetes* spp., *teonanacatl*), *Daturas*, *ololiuhqui* (a narcotic morning-glory), tobacco, alcoholic beverages, and possibly *Sophora secundiflora* or the "mescal bean" besides!

One of the most poorly understood of American "phantastika" or hallucinogens is the drink made from the "Death Vine," variously designated as *ayahuasca*, *caapi*, and *yajé*, and known only since Villaviencio wrote a geography of Ecuador in 1858. It has an extraordinarily bizarre ability to alter the mind, and has evidently (on distributional grounds) been used by the Indian tribes of western Amazonia since prehistoric times. The botanist Spruce's study of *caapi* among the Tukanoan Indians of the Uaupés River in Amazonian Brazil was published posthumously only in 1908. He identified *caapi* as the malpighiaceae *Banisteria* (now *Banisteriopsis*) *caapi*. The Indians of the upper Rio Negro use it for divination and prophecy by the shaman, and also to give to young male initiates in the severely painful *yurupari* puberty ordeal. The intoxication by *caapi* has been reported as pleasant and characterized, among other strange effects, by visual hallucinations; in excessive amounts, it is said to produce frighteningly nightmarish visions and a feeling of extremely reckless abandon, although consciousness is not lost nor is the use of the limbs unduly affected. After Spruce, the botany of several native psychotropic plants of the *ayahuasca-caapi-yajé* group became

⁷ Richard E. Schultes, "Botanical Sources of the New World Narcotics," *Psychedelic Review*, 1 (1963) 145-166, p. 154. Cf. *Idem*, "Hallucinogenic Plants of the New World," *Harvard Review*, 1 (1963) 18-32, p. 23.

very confused; but it presently appears that several species are involved, *Banisteriopsis Caapi*, *B. inebrians*, *B. Rusbyana* (sometimes with admixture of *Malouetia Tamaquarina*, a toxic apocynaceous tree), and perhaps also *Prestonia amazonica*, and *Tetrapteryx methystica*. The alkaloid of *B. Caapi* has been established as harmine. But despite the botanical and pharmacological chaos of the *ayahuasca-caapi-yajé* group, all those reported are ethnographically consistent in use.

In two widely separated regions, species of *Ilex* have been used by various American Indian tribes. In South America, *Ilex Paraguanensis* is the familiar *maté*. In the southeastern United States *Ilex yaupon* is the source of the "yaupon tea," still said to be used by country folk on the Outer Banks of North Carolina where, presumably, the famous "Lost Colony" of Roanoke disappeared. *Ilex vomitoria* and *I. cassine* were the source of the well-known "Black Drink" used in the "huskinawing" or rough hazing puberty ceremonials of the Indians of Virginia and southward.

Shortly after the Spanish Conquest, chroniclers in Mexico recorded a strange hallucinogenic plant *ololiuhqui*, described as a vine, the seeds of which were used by natives to produce visions. Persecution by the Church drove this narcotic plant into hiding for four centuries. The botanist Safford (who had also mistakenly identified the narcotic mushroom *teonanacatl* with the cactus *peyotl*) thought that *ololiuhqui*, although described as a vine and pictured in Hernandez as a convolvulaceous plant, must be a *Datura* species. However, *ololiuhqui* was found, in 1938, still in use by a curandero in the hills of Oaxaca, and identifiable as *Rivea corymbosa*. The Canadian psychiatrist, Osmond, reported four experiments on *Rivea*-intoxication in 1955: it gave subjects apathy and listlessness, together with heightened visual perception and hypnagogic phenomena, but without mental confusion, and an altered time perception followed a few hours later by a calm, alert euphoria. Recently, Wasson has identified the Aztec *tlitlitzten* as the seeds of another morning-glory, *Ipomoea violacea*. In 1960, Hofmann found in both the *Ipomoea* and *Rivea* species the amides of lysergic and d-lysergic acids, chanoclavine and clymoclavine, hitherto known only in the fungus ergot (*Claviceps purpurea*). Both drugs are

powerfully psychotropic, and chastened scholars are now willing to credit the accuracy of Hernandez' statement that Aztec "priests communed with their gods... to receive a message from them (by) eating the seeds to induce a delirium when a thousand visions and satanic hallucinations appeared to them."⁸

In Hispaniola, Trinidad and the Orinoco basin (*otomiscs*) Indian tribes were discovered to be using a *yopo*, snuff unlike tobacco which has since been identified as *Piptadenia peregrina*, the major alkaloid of which is bufotenin. Ethnographers are familiar with the Y-shaped tubes which the Indians used to snuff up the powder of this intoxicant plant. In Peruvian Amazonia, the little-known *huilca* snuff has been identified as *P. macrocarpa*, a divinatory snuff of the ancient Peruvian. Since some of these tribes were Caribs and Arawaks, with linguistic congeners in Amazonia, much interest should surround the recent discovery in Central Brazilian Amazonia of a hallucinogenic snuff, known only in Portuguese as *rapé dos índios*, "Indian snuff." The only source of information was the late Dr. George A. Black, botanical explorer of the Amazon, in the rapids of which he was accidentally drowned, who wrote to the Harvard botanist, Dr. R. E. Schultes, that the *rapé* was made of the fruit of a gigantic forest tree *Olmedioperbea sclerophylla* of the Mulberry Family. "Unfortunately, we have no data concerning its manner of use, and we do not know what the active principle may be."⁹ *Yakee* and *parica* are quite different snuffs of the Orinoco basin, *Virola, cakophylla, V. callophyloidea*, and perhaps also *V. elongata*, all of them myristicaceae, to which the nutmeg tree belongs. The active principle is probably myristicine, commonly found in this family.

The Mazatec Indians of northeastern Oaxaca, Mexico, and possibly the adjacent Cuicatec and Chinantec tribes, have recently been discovered using a *Salvia* species of the *Labiatae* or Mint Family as an hallucinogenic narcotic. In Spanish the leaves of this plant are known as "hojas de la pastora" or "hojas de Maria Pastora," in Mazatec as *ska-Pastora*. The species, new to science, is now designated as *Salvia divinatorum*; and, although

⁸ Schultes, *Botanical Sources*, p. 156.

⁹ Schultes, *Hallucinogenic Plants*, p. 26.

well known to the Mazatec, there seem to be no reports of magico-religious uses from Spanish colonial times. The psychotomimetic properties of the mint have been reported by its discover, R. G. Wasson.¹⁰ If the plant indeed was not used aboriginally, then we must postulate a continuing botanical search by Mexican Indians for psychotropic plant substances.

One of the most fascinating discoveries, however, has been the identification of the ancient Mexican narcotic which the Aztec called *teonanacatl*. In colonial times, the Spanish friar Sahagùn of the great Florentine Codex wrote of native plants of the Chichimeca "that they call *nanacatl*, which are toadstools (*hongos malos*) that also (like peyotl) make one drunk like wine." Again, in a special chapter on intoxicating plants, Sahagùn discriminated between the cactus peyotl and "little mushrooms in their land that they call *teonanacatl*; they grow under the grass in the fields, they are round, and have a rather high stem, delicate and round; eaten, they are of bad taste, harm the throat, and intoxicate." The naturalist Hernandez described *teonanacatl* under the explicit heading, *De nanacatl seu Fungorum genere*; and from the harmless white mushrooms *iztacnanacame*, the red *tlapalnanacame*, and the yellow-orbicular *chimalnanacame*, he distinguished *teonanacatl* as "teyhuinti," that is "intoxicating." Semeon, in his Nahuatl dictionary, even uses *teonanacatl* as an example of mushrooms ("espèce de petit champignon qui a mauvais gout")! Nevertheless, in 1915, the prestigious botanist, W. E. Safford, identified the mushroom *teonanacatl* (then unknown to science) with the cactus peyotl, *Lophophora williamsii*. On textual and ethnographic grounds the present writer, although not a botanist, ventured to dispute this identification in a doctoral dissertation of 1938, inasmuch as the colonial Spanish sources repeatedly mentioned *hongos*, "mushrooms," and described them explicitly. The present writer, after reviewing the evidence, stated flatly of peyote that "this cactus is wholly distinct from the little yellow thin-stemmed fungus *teo-nanacatl*, and Safford's identification of the two is erroneous."¹¹

¹⁰ R. Gordon Wasson, "A new Mexican Psychotropic Drug from the Mint Family," *Botanical Museum Leaflets, Harvard University*, 60 (1962) 77-84.

¹¹ La Barre, *The Peyote Cult*, Appendix 3, pp. 128-130.

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There were other disputants of Safford's identification as well, one of them,

B. P. Reko, a physician who had done extensive botanical collecting in Mexico and who, as early as 1919 and 1923, wrote that the sacred mushroom was a dung-fungus still employed religiously in Oaxaca. In 1936, Weitlaner, an engineer of Mexico City, sent a few mushrooms, said to be used narcotically in Oaxaca, to the Harvard Botanical Museum, but their poor state of preservation made it impossible to identify them beyond the genus *Panaeolus*. Then in 1938 and 1939 (Schultes) collected the dung-fungus *Panaeolus sphinctrinus* as one of the mushrooms used by the Mazatec Indians in northeastern Oaxaca. A poor specimen of *Stropharia cubensis* was likewise collected during this ethnobotanical field trip to Oaxaca. (Schultes) published two papers indicating (his) belief that the teonanacatl of the Aztecs was *Panaeolus sphinctrinus* and stated that other mushrooms might be involved as well.

Botanical field work meanwhile took Schultes to Amazonia for twelve years and he never returned to pursue his researches in Oaxaca. Fifteen years later, the wealthy amateur ethnomycologists, Gordon and Valentina Wasson, read the papers of Schultes and immediately began pursuit of the fascinating mystery.

They first went to Oaxaca in 1953; later they carried out field studies together on several occasions and then, after the death of Mrs. Wasson, a New York physician, Mr. Wasson continued on his own—making a total of ten trips to study the hallucinogenic mushrooms. On almost every trip he took along specialists in botany, chemistry, ethnology and other fields. Their researches have resulted in a most outstanding model of interdisciplinary investigation. With the French mycologist, Heim, Wasson has published an impressive list of some 20 species of mushrooms in four genera which are used in religious rites and for their hallucinogenic properties in Mexico¹².

¹² Schultes, *Hallucinogenic Plants*, pp. 28-29. A brief survey of the history of research on *teonanacatl*, together with a definitive annotated bibliography, is: R. Gordon Wasson, "The Hallucinogenic Mushrooms of Mexico and Psilocybin: A Bibliography," *Botanical Museum Leaflets, Harvard University*, 20 (1962) 25-73. The most comprehensive work is that of Roger Heim et R. Gordon Wasson, *Les Champignons Hallucinogènes du Mexique: Etudes Ethnologiques, Taxinomiques, Biologiques, Physiologiques et Chimiques*. With the Collaboration of Albert Hofmann, Roger Cailleux, A. Cerletti, Arthur Brack, Hans Kobel, Jean Delay, Pierre Pichot, Th. Lempérière, and J. Nicolas-Charles (*Archives du Muséum*

Sacred mushrooms are now known to be used by the Mazatec, Chinantec, Chatino, Sapotec, Mixtec, Mixé, Nahuatl, and perhaps also the Tarascan and Otomi. Wasson considers that the use of hallucinogenic mushrooms was more widespread in ancient times than in the present, basing his belief on curious archaeological finds now dubbed "mushroom stones" but formerly conjectured to be phallic objects. These have a vertical stem with a man-like figure, the top being an umbrella-shaped portion of a sphere. Over a hundred specimens are known, mostly from the highland Maya of Guatemala, and some date back to 1000 B.C. They have long puzzled archaeologists, but it is safe to affirm now that they were some sort of image concerned with a sacred mushroom cult. Unfortunately, the elegant work of the Wassons and Heim has been followed by an undisciplined exploitation of psilocybin (isolated from *Psilocybe mexicana* by the Swiss chemist Hofmann) by dubious experimenters at Harvard, and even by international "beatniks."

Coca, Erythroxylon Coca, source of cocaine, is too widely known to need more than mention here. Coca has been cultivated by Andeans for so long a time that it is now unknown in the wild state. Dried coca leaves have been found in mummy bundles of Peru dating back at least 2000 years. In pre-Columbian times, the use of coca was restricted to religious functionaries, but since colonial Spanish days it is used almost universally by all Andean Indians. The chewing of coca has spread from the Andean region into the northwest Amazonian regions of Colombia and Peru, but instead of chewing it with lime, the Amazonians mix it with ashes of *Crecropia* tree leaves. The chemistry of coca is very complex, with a number of alkaloids in six groups of the tropane series. The cocaine

National d'Histoire Naturelle, 1958, Series 7, Vol. VI) Paris: Muséum National d'Histoire Naturelle, 1959, 322 pp., 36 plates, 28.000 F. An excellent summary is that of Roger Heim, *Champignons toxiques et hallucinogènes*, Paris: Boubée & Cie., 1962. The best summary in English on New World narcotics, hallucinogens and psychotropic drugs (to which the present study is much indebted) is by Richard E. Schultes, "Native Narcotics of the New World" and "Botany Attacks the Hallucinogens," *The Pharmaceutical Sciences*, Third Lecture Series, 1960, Lectures 2 & 3, pp. 139-185.

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alkaloids are among the greatest contributions of American Indians to modern medicine. But the original use of coca was religious.

This list of native American drugs—we have not mentioned *coboba*, *pasta guarana*, *vinho de Jurumena* and others—is quite incomplete. But perhaps it may suffice for our purpose: to draw attention to one important material source of religious experience, the psychotropic drugs, which as early as Mesolithic times may have been critically important in shaping shamanism, a form which may underlie in time all religions, both of the Old World and the New.