

A Survey of Shamanic Options

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I'm sure you're all aware of the situation of peril in which the Amazon rainforest finds itself. Very large conservation organizations such as the World Wildlife Fund are working very hard to preserve large tracts of the Amazon *in situ* and to essentially make large parks. This is commendable and should certainly be done, but what is not being done is an effort to preserve human information about the rainforest. In other words, no effort is being made to conserve the heritage of the people who have lived in and adjacent to the rainforests over millennia. My estimate would be that this information, which is extremely fragile, will be lost by sometime after the turn of the century.

It's not hard to understand why this is happening. It's a consequence of the impact of market economies on preliterate tribal people in the Third World. In the case of the Amazon, the men are leaving the remote villages and going to work in sawmills and as outboard motor captains and mechanics. The kind of transformation that always accompanies urbanization and the arrival of a money economy is taking place, yet these people have a body of medical data that has served them very well over thousands of years. Now, because they are impressed with the values of Western medicine and can buy all kinds of *remedios* at any drugstore in the city, the importance of this knowledge is no longer apparent to them and so it's being lost.

I have no reason to doubt the DEA statistics which say that 70% of the cocaine produced in South America is coming out of the Colombian Amazon. I know nothing about it. As a botanist, I can tell you that the Colombian Amazon is the area richest in plant species in the entire Amazon Basin. As near as we can tell, looking at the geohistory of the basin, at times it's been considerably drier. During glaciations, when water is concentrated at the poles, the high rainfall areas of the Amazon diminish in size. The Colombian Amazon is one of those areas that is always wet, and it has consequently produced a fantastic speciation of plants. One biogeographer or geologist estimates that the Amazon Basin has been above water continuously for 220 million years. This is longer than most places in the world. It's estimated that the Madagascar Plate, which is a relic

plate that now comprises Seychelles, Mauritius and the Malagasy Republic in eastern Africa and the Indian Ocean, that land has been above water 350 million years and is the oldest above-water site on the planet. The Amazon Basin, by virtue of heavy rainfall, continuous lack of inundation, and by being tropical, has been like a laboratory for speciation both of animals and plants, so that the Colombian Amazon, which is the concentrated center of this process, has the most intense concentration of variegated species and genetic material on the planet. It *should* be made into a vast natural park. If that can't be done, then it should be left alone. What the American government has decided is a better course is that it should be defoliated, that a chemical called Spike should be aerially sprayed over this valley in order to kill coca bushes.

I don't know who dreams this stuff up, but any one of you on the ground for twenty minutes in this scene would be convinced that nothing could be stupider, that this is essentially like burning down the forest to kill the ants. There may be a lot of coca there, I don't know, but there's a lot of other stuff there for sure. There are hundreds of distinct tribes, dozens of language groups, tens of thousands of unique species of plants and animals. It is floristically and faunistically one of the five or six richest areas on the planet. As if the inroads of capitalism and Maoist politics were not enough, you're also going to get a bunch of clowns from the DEA who want to defoliate it. If any of you have political pull or are of the letter writing type you might put some pressure on anyone you know to halt this. This is really a kind of ecocidal atrocity, and if something isn't done, like all the other ecocidal atrocities it'll be history before most people are even informed of what is going on. This is really one of the great policy wrong turnings, for many reasons. I don't expect the state department to be sympathetic to endangered plants, but what is happening is that all of Peru is being pushed into the arms of Sendero Luminoso, which is one of the most peculiar and radical political philosophies on the earth today; it rivals Pol Pot for having a no holds barred approach to dealing with its enemies. Peru daily is being pushed into the arms of this extremely radical faction by a combination of mismanaged Peruvian economic policies and mismanaged American policies toward the *campesinos*, toward the poor people who grow the coca, because they are seeing Sendero as their only protector, their only hope. It's a repeat performance of a sad story that has been seen in many parts of the world.

Well, that's enough political polemics. What I thought I would do today is just briefly survey the world, looking at the shamanic options in the plant area, trying to see just what is available, what are the history, chemistry, pharmacology and botany of the relevant species. I'll go through this in the way of a survey; it's not a rhetorical flight of fancy unless we lose control. I've talked a lot about Africa, about the emergence of culture and my belief that language and complex neural processing were catalyzed into existence by exposure to psilocybin mushrooms in the veldt situation of ancient Africa. I think I've said enough about that. What I thought I would talk about today regarding Africa are the existing cults of shamanic or hallucinogenic plant usage in Africa.

Africa is a special case because it is, of all the continents, the continent most heavily impacted by human presence, because of course human beings

evolved in Africa, fire was discovered and used in Africa before it was used anywhere else, and also the ecosystems of Africa had a particular fragility in relationship to the dryness that comes and goes with glaciations. So in spite of the fact that I propose Africa as the cradle of human emergence under the influence of psychedelic plant synergies, today Africa is noticeably poor in hallucinogenic plants. The most interesting hallucinogen in the African situation is *Tabernanthe iboga*. *Tabernanthe iboga* is a tree in the *Rubiaceae* or a small bush, depending on edaphic factors. *Tabernanthe iboga* contains the alkaloid ibogaine. There's a paradox about ibogaine, which is that of all the indole hallucinogens it was the earliest to come to the attention of Western researchers. In the 1870s and '80s, when Belgium was in control of the Congo and exporting huge amounts of ivory and gold out of Africa, entrepreneurs seized upon this plant, *Tabernanthe iboga*, and created tonics that were compounded with it as the main ingredient. It was sold as a tonic and an aphrodisiac, and in some cases it was understood to be an intoxicant. Much in the way that Vin Mariani was marketed — the famous coca preparation which was the rage in the 1880s in Europe — much in the same way, iboga tonics were marketed in the 19th century, but the alkaloid was never thoroughly studied after the turn of the century and of all the indoles we know the least about this one. It has a complex molecular structure placing it closer in structural affinity to LSD than to any other psychoactive indole.

Indoles are a class of hallucinogens that are based on a molecular structure that involves a benzene group, which is a six-sided structure, attached to a pyrrole group, a five-sided structure. Built off on them there may be another six, that gives you the β -carboline family, there may be just a side chain, that gives you the tryptamine family, or there may be more complex stereochemical attachments and they give you the LSD-, ibogaine-type structure. So indole refers to a small family of psychoactive compounds, not necessarily all psychoactive compounds. Not opiates, not tropanes, which are the things in datura, not the polyhydric alcohols of cannabis, tetrahydrocannabinol. This particular small group of plants are united by this chemical structure that seems to lay the basis for the most psychoactive of the hallucinogens because of its affinities to serotonin's chemical structure. Iboga is used by the Fang people, most notably in Gabon and around the capital city in Ghana, in Nigeria and in Zaire. It has an interesting and suggestive usage.

First, let's deal with this question of its aphrodisiac usage. As you know, an aphrodisiac is a chemical substance thought to make one either capable of or susceptible to sexual activity. Over thousands of years this has been a recurring theme of fascination for human beings, for obvious reasons. The definition takes on different nuances in the hands of different people. Probably the best known so-called aphrodisiac among ordinary folks is the so-called Spanish fly, which is cantharidin. The carapaces of a small desert beetle can be ground down to yield cantharidin. If you give someone cantharidin in a carefully calculated dose, they have a generalized reaction to it where they can gain relief from this reaction by having sex, but it is not a true aphrodisiac, it's more like a genital itching or something. It's a strongly localized to the erogenous zone

kind of itching, and so this is a pseudo-aphrodisiac. All CNS stimulants in low doses present themselves as what's called arousal: attention to incoming detail, slightly elevated blood pressure, so forth and so on. This is a precondition for sexual activity but it is not a true aphrodisiac. In fact, when you sort through the many candidates for aphrodisiacs — as you know, they range from powdered rhinoceros horn to mangoes to oysters — interestingly enough, ibogaine is the only thing which actually seems to pass the test. Ibogaine is an aphrodisiac in the truest sense of the word, and I take that to mean this: if you are interested in sexual activity, it promotes, facilitates and enhances it. If you are not, it doesn't. It doesn't overwhelm the intentions of the user. This seems to be one pathway that the psychic energy that it releases can be shunted down, but there are others. Paradoxically, the way it's used in the Fang society is that it's a major force holding couples together.

Fang society is quite complex, and it's structured in such a way that there is a built-in high anxiety factor about women among men. The reason for this is an unusual set of customs which we don't really find duplicated anywhere else in the world. It goes like this: a man may have more than one wife. A wife is always accompanied by a dowry. The dowry is always quite large, in the sense that it is always a strain on the girl's family to get the dowry together. When a woman marries, she and her dowry go to the village of her husband, but what is unusual in this situation is that divorce is very easy for the woman to obtain, and if a woman leaves her husband the dowry must be returned. So men are in a constant dither about hanging on to women, because the dowry must be returned even if it has been spent. These are family relationships — these aren't relationships between a man and a girl's parents, these are relationships between two filial structures — so it can become quite complicated. In fact, Fang men between the ages of 25 and 45 spend enormous amounts of their lives making journeys to the villages of their former wives to negotiate dowry return, because the concept of used goods is recognized. It isn't simply that the guy has to pay back the dowry, it's that he has to meet with the girl's family and argue with them about how much she was really worth, and this often ends in bloodshed.

So into this social structure that is prestructured for anxiety about women comes this psychedelic aphrodisiac that promotes not only pair-bonding but community bonding. The cult of iboga is not the generalized cult of the Fang. They have many cults and some are Baptists and Mormons, but when a couple gets into trouble, the old men of the village will often say to them, "Why don't you join Bwiti," this cult, "You're having marital problems. Why don't you join Bwiti, and perhaps your wife will reconsider and decide to stay with you." It has actually become a very interesting force for social cohesion. In fact, sociological studies have shown that members of the Bwiti cult have a divorce rate far below that of general Fang society. I spend so much time on this because this is an unusual role for a hallucinogen. We just don't see them playing these secondary socially catalytic roles. Iboga is a strong hallucinogen and it's usually given to a person in very massive doses at the initiatory exposure, which can come in late adolescence. People do die occasionally from it, but the amounts eaten are

almost beyond credibility, because they talk in terms of tablespoons and people will go to the river and eat two table spoons. . .

Methods of preparing *haoma* and *soma* which are very puzzling when you try to apply them to a mushroom — there's all this talk about how it's squeezed, it's filtered — a bunch of processes are described which if you try to carry them out on a mushroom it will just leave you with a mess, but if you carry them out on *Peganum harmala* it quite reliably produces a yellow fluid rich in harmaline that is probably an intoxicant. This is an area where research needs to be done. I urge any of you who are interested in ayahuasca or interested in β -carbolines in psychotherapy to look at Flattery's book. It's brand new, 1989, University of California Press Near Eastern Studies Volume 21, *Haoma and Harmaline*.

OK, moving on east across the Iranian Plateau into India, which is certainly a great cradle of esoteric spirituality, what we discover is a surprising poverty of true, i.e. indole, hallucinogens. There are interesting substitutes, aside from *Peganum harmala* which I've mentioned, of which there is very little textual evidence for use in India. The two things which have to stand out in Indian psychophytoshamanism would be, number one, datura species. We might as well talk about them now because we will meet them on every continent, including in Africa. I just read an article about a group in Tanzania, interesting group. *Datura fastuosa*, taken by women only in a women's initiation rite which involves a labial measuring rite at the height of the trip, and what are culturally sanctioned are blue hallucinations. The women strive for blue hallucinations, and if they don't achieve them it's considered an unsuccessful invitation. The anthropologist who wrote on this called this "a culturally sanctioned hallucination." I'm not sure what is meant here. Do they mean that anthropologists, white people, don't have blue hallucinations, they just have hallucinations and that somehow it's expectation that directs this? I'm not sure, I don't associate blue hallucinations with tropanes, but it is certainly true that blue hallucinations attach themselves to ayahuasca. People have even called it "the search for the blue flash." If you have ever taken ayahuasca you know that there is a moment when what appears to be the world's entire supply of magenta jello is unleashed upon you and flows past you and through you, and it invariably is this electric cerulean blue merging into magenta, a very typical presentation of that. Datura species of many types occur throughout the world in the tropical and the temperate zone. There are several species in India, and texts on yoga and on Indian spirituality never stress this. Use of datura is quite strongly a part of sadhu-type spirituality. It's too much for ordinary people, but when you hang out with sadhus the little prickly pods of datura are as common to find cast about their dwelling places and gathering areas as are the evidences of *charas* smoking.

That brings me to the second major component of the psychoactive flora of the subcontinent, which is cannabis. Cannabis is not an indole, but cannabis must be considered a psychoactive plant of great age and human association. Cannabis is hemp, cannabis is the source of fiber for weaving, and we find hempen fibers in graves 8,000-9,000 years old, at Çatalhöyük, for one place. It's fascinating, the way in which the metaphors of the weaver are the metaphors

for human cognitive activity generally. In the '50s a famous book was published called *Man Is a Weaver* that pursued this theme, but never made the connection to fibrous hemp. We weave a tale, we tell a yarn, we have all these fiber and weaving words that we connect to poetic or narrative activity. Most of us who are aficionados of cannabis in these latter days smoke it — and don't smoke *charas* or hashish, because it's rare in this country, but smoke bud, the flowering tops of marijuana — but if you actually eat hashish, you can convince yourself that this was the LSD of the ancient world and the 19th century.

Théophile Gautier, Baudelaire, Verlaine and Rimbaud, that crowd — there was this society called the Club des Hashischins in Paris, and they met at the old Hôtel de Lauzun on the Left Bank and ate jellied cannabis that they were getting from Morocco with little silver spoons. The descriptions of these experiences make it clear that this was operating as a hallucinogen. They are not more florid or less florid than the descriptions of LSD that we get from Aldous Huxley and Tim Leary in the early 1960s and 1970s, I mean, this stuff was taking them away. I don't advise you to eat hashish or *charas* for a very practical reason, which is that it's collected off people's hands, and your immune system is just electrified by the presence of all of this material that's been rubbed off your hands. I suppose we could put it through an X-ray machine and then we could eat it with impunity, but we can't sell short the spiritual power of cannabis.

Some of you may know this book *Oracles and Demons of Tibet* by René de Nebesky-Wojkowitz. Nebesky-Wojkowitz studied shamanism, was not interested in Tibetan Buddhism but was interested in the pre-Buddhist strata. In that book there are pictures of Bön-Po shamans intoxicated on hashish, experiencing fits and near-convulsions in an oracular trance in a village near Mustang. It is not a minor psychedelic substance at all, it's a very powerful psychedelic substance, especially when concentrated and then eaten. Opium is an Asian plant, but I'm not going to talk about it in the context of psychedelics; I think you know enough about opium and its history. What I will point out is the surprising absence of hallucinogens in the Old World tropics. By the Old World tropics we mean the Indonesian tropics. This is an area that I'm very well familiar with, having spent a lot of time out there as a professional insect collector in my pre-botany days. There just are no major hallucinogenic plants in the Indonesian or Philippine or Southeast Asian tropics. There are certain suspect plants but with none of them do we encounter a living cult that would give a clue to this thing as a major item of human spiritual or cultural usage.

Audience: What are the magic mushrooms we hear about from Indonesia that are available there, supposedly openly?

When I was in Bali this practice was absolutely unknown, these famous omelettes of Kuta Beach. Until somebody argues differently, the most reasonable thing to assume is that coprophilic mushrooms have just followed cattle around and around the world in the warm tropics. The mushroom that is most commonly offered tourists in Bali is not *Stropharia cubensis*, it's a *Copelandia*, it's a weaker mushroom. There are a number of these dung-loving mushrooms that contain

psilocybin but almost all of them also contain an emetic, which means that it makes you throw up. The Hawaiian mushrooms that people rave about are actually, from the point of view of someone who knows psilocybin mushrooms, a very inferior choice. If you go to Thailand, if you go to Ko Samui and the islands of the south, you'll be offered mushrooms, and I quickly understood that there was, to a certain degree, a shell game going on. What it is is this: the people selling the mushrooms have learned from the school of hard knocks that it's a bad idea to wire up naive Westerners with massive amounts of hallucinogenic drugs, because then you get in trouble with the local constable and so forth, so unless you are on it, in southern Thailand what they will sell you are mushrooms that have grown in the dung of water buffalo, and right there in the next field over is the dung of zebu cattle, and that has *Stropharia cubensis* in it, but they try to steer you away from that because it's so much stronger. They just want people to get a buzz on. So if you're buying mushrooms in southern Thailand, try to go with the guy to collect them and see where they're coming from. Now, there's an easy test to tell these *Panaeolus* and *Copelandia* species from *Stropharia*. They will do what is called autodigest; some mushrooms do this and some don't. That means that if you pick the mushroom and lay it in the sun on a stone and you come back in an hour or two and it's turned to slime, it was not *Stropharia cubensis*, it was a *Copelandia* or a *Panaeolus*. They literally dissolve themselves at death. This is not a quality of *Stropharia*.

There's been a lot of wondering about this thing: why are there no hallucinogenic plants in the Old World tropics when in the New World tropics, the Amazon Basin, it is the most concentrated ecosystem for hallucinogenic plants? The thinking is that the tropics are the tropics. Who can imagine a set of evolutionary factors that would favor the evolution of many species of hallucinogens in one hemisphere but not in the other hemisphere? It's very hard to picture a neo-Darwinian mechanism that would give you that result. Different suggestions have been made; one is that there actually are as many hallucinogens in Indonesia as in South America, but because the Dutch have been there for 450 years, the level of indigenous culture, the "primitiveness," so-called, of indigenous culture, has been mucked with, and consequently the people have forgotten these things. Well, that's a good theory, but when a botanist who is not an ethnographer goes over the species lists and looks at the suspect families of plants, you also don't find hallucinogens. You see, certain families of plants are highly suspect for hallucinogens. For instance, the *Leguminosae*: this is the family of flowering trees with finely divided leaves. This is a typical leguminous tree, this locust-like thing, and they occur all over the world as trees and bushes. This is a family that always has a very exotic chemistry, not hallucinogens per se, but flavonoids, saponins, terpenes, sesquiterpenes, all kinds of exotic tertiary byproducts. A mimosa is a typical example. Another family that is always suspect that you look at first is the *Rubiaceae*. We know this as the family that contains tea, and of course caffeine is an alkaloid that is sequestered in the bean of this plant in surprising concentrations, but some of the *Rubiaceae* contain DMT and other psychoactive compounds. Another family that is always one of the first ones you check out are the *Euphorbiaceae*.

These are the fleshy Old World succulents that bleed latex when cut. They often have extremely poisonous or sometimes psychedelic principles in them.

So much, then, for the Old World. As you know, when there is ice at the poles there are land bridges between Siberia and Alaska, and this is the route that most anthropologists believe the major migrations into the New World took. There's an interesting consequence of this northern migration route to the New World. People didn't just set out on a trip from Manchuria to San Diego, this happened over centuries, millennia. The people would move a few miles, have children and die, so what it means is that cultures crossing into the New World had to go through a neck of cold land, a floristically extremely restricted environment represented by the Arctic tundra. We can imagine that this would have stripped away many traditions of plant usage as they moved north out of the areas where these plants occurred. The role of cannabis is not clear, but for instance, no opium was carried to the New World by these ancient peoples. In fact, very few plants at all were; cannabis is the one slightly puzzling exception.

It may be that cannabis was carried to the New World by people crossing the Siberian land bridge. Cannabis does grow in Alaska under special conditions with a very short growing season, and it's possible that this happened. The botanical closeness between *Cannabis sativa*, the Mexican marijuana plant, and *Cannabis ruderalis*, the weed hemp of Central Asia, indicates that probably these things were separated not too long ago. What has happened with cannabis speciation in Asia is that even without the narcotic dimension to the cannabis plant, we can see that very early on there was selective pressure on it by human beings to produce good fiber stock, so what you get in India is a division into fiber tribes and drug tribes in cannabis. The resin tribes are extremely heavily selected for the production of resin, and they are the source of the narcotic *charas*.

Amanita muscaria, the hypothesized mushroom *soma* in Wasson's view, and for sure a hallucinogen of use in Siberia among the Ostyax, Koryaks, Kamchatkan and Yakut tribes, this whole group of people. When scholars study a worldwide phenomenon of any sort, they like to have a baseline area to compare everything else to. This is why, for instance, the volcanos of Hawaii are *the* volcanos of this planet. All other volcanos are compared to them; they are the baseline volcanos, and the Hawaiian words for various lava types and this sort of thing have been adopted by volcanologists worldwide. All rough lava is called aa, all smooth lava is called pahoehoe, because these things have been adapted. Well, a similar thing went on in the study of shamanism. Mircea Eliade and other people were looking for what they felt was the pure, the original, the real shamanism, and they focused on Siberia, now we see for reasons apparently quite arbitrary, mainly that they had a lot of ethnographic data on Siberia. There's no reason to hold the Hopi medicine man, the Amazonian *ayahuasquero* and the Hawaiian *kapu* man up to a Siberian standard, but nevertheless the literature preserves this, so the model or paradigmatic intoxicant of the paradigmatic shaman was *Amanita muscaria*.

There are a lot of problems with this. *Amanita muscaria* is not a reliable

intoxicant. It is subject to geographic variation, seasonal variation, genetic variation. There are toxins present in it that are also subject to variation. You can end up with an NDE rather than a hallucinogenic experience if you just miss the mark slightly with this one. Nevertheless, it is circumarctic in its distribution. It occurs in Denmark, across the northern reaches of the Soviet Union, into Alaska and into Canada, and it's generalized in that range. As you move south it retreats to higher and higher altitudes, with certain exceptions. For instance, in California it can be found at sea level in some ecosystems. Some of you may know Baker Beach, a beach that lies outside the Golden Gate Bridge in this very ritzy district of old mansions. Well, go on a rainy January day down to Baker Beach. There are a lot of birch trees and these kinds of trees planted in old sea sand, and my God, this is an amanita ecosystem that you will not believe. I have seen not only *Amanita muscaria* by the bushel and *Amanita pantherina* but rare, rare *Amanitas*. The chocolate brown one, *Porphyria*, rumoured to contain β -carboline, and *Rugosa*, and the deadly one, *Virosa*, the one they call the destroying angel. All of these amanitas can be seen within a half mile walk of each other, specimens the size of dinner plates. What this means is that people moving south through British Columbia and on into the Great Plains and West Coast of North America had been shorn of their phytoshamanic knowledge because they had just come through centuries and centuries of migration through hallucinogen-poor environments. To my mind, this explains the curious absence of major hallucinogens in North American Indian spirituality. North American Indian spirituality relies largely on ordeals, the Sun Dance ordeal and this sort of thing. There are minor psychoactives such as *Acorus calamus*, sweet flag root, but really, North American Indian shamanism is not a shamanism of hallucinogenic ecstasy.

The use of peyote, which might be offered as the counterexample, is astonishingly difficult to document before just a few hundred years ago. We like to think that people have been taking peyote in the New World for millennia, but in fact it seems to be something that came up out of Mexico, where the Tarahumara may have had it in a very localized culture complex, but with the Indians in the western United States getting the shit kicked out of them by the U.S. Army there was pressure for revitalization. Any of you who are anthropologists understand how this works: if you put pressure on a people, they will launch revitalization movements. The Ghost Dance religion of the Sioux, Algonquin and Plains people was largely a revitalization movement based on peyote. What appears to have been going on in the temperate Mesoamerican zone anciently was the use of *Sophora secundiflora*, which is a highly poisonous plant. It is what anthropologists call an ordeal poison, not a hallucinogen.

Ordeal poisons are a rougher way to end up at the same place. The place on earth — for unknown reasons, or reasons not known to me, anyway — where ordeal poisons have been perfected is on the island of Madagascar, mentioned earlier in this lecture as one of those sites where land has been above water longer than anywhere else on earth. On the island of Madagascar, the Malagasy Republic, tribal people have located a number of plants that are extremely temporary poisoners, so that you think you're going to die, you beg for death,

and you don't die, you recover fully in 12-16 hours. It is so agonizing, and you so completely wish for death in this experience that when you finally realize that you're going to live through it you have the equivalent of a psychedelic experience. Tears of joy well up, you embrace the earth, you give thanks to God and you come clean, but this is a tougher way to do it than most of us might prefer. Sometimes you have psychedelic trips like that, where the fact that it is over is such cause for rejoicing that you hardly know who to thank. Apparently North American Indian shamanism tended in this direction, and only peyote arriving late mitigated that. Peyote still partakes of this to some degree. It is a minor ordeal, especially if you eat enough peyote to trigger truly intense hallucinations. What I've found sitting in peyote circles is that most people only take enough to be able to sit in the circle without nodding out. At low doses, of course, mescaline and amphetamine will wire you up, but it takes a lot to put you into Don Juan country. It is not an indole, it is a psychoactive amphetamine, more closely related to the synthetic psychoactive amphetamines such as MDA and MDMA.

Now we are on the brink of moving down into Mesoamerica, onto the Mexican isthmus, and we are approaching this puzzling concentration of psychoactive plants. Basically, you could start your border at the Rio Grande and it goes south to Argentina, and in that zone there is a tremendous richness of psychoactive plants of all types in many plant families. I've mentioned peyote, I've mentioned datura in another context. Datura cults are very big, and datura has to be viewed as an ordeal poison. It is a hallucinogen but it's also a kind of deliriant and a kind of a frenzy-inducing thing. It's very hard to take much out of it; you have intense experiences but the perceiving mind has been somehow interfered with. Nevertheless, in southern California — Catalina Island, San Diego County — in ancient times there was what was called the *toloache* religion of the Luiseño people. This was an adolescent initiation for males that involved being taken into the desert and given large amounts of datura over days. This would be a completely boundary-dissolving, consciousness-altering experience.

As we go deeper into Mexico and leave the deserts behind and begin to approach the mountain range of the Sierra Mazateca and the Central Mexican highland, we come upon what, in some ways, is one of the most interesting shamanic hallucinogen complexes, which is the Central Mexican mushroom complex discovered by Gordon and Valentina Wasson in the early '50s. Now, these are not mushrooms that grow in the dung of cows or any other animal. These are what mycologists call ephemeral mushrooms, meaning small, diminutive and briefly present as fruiting bodies. Ephemeral mushrooms actually live in very restricted ecosystems. One of them lives in the waste from sugarcane, so it can only grow in matted vegetable material. The one called *derrumbe*, the earthquake mushroom, grows only in disturbed land where there is erosion or shifting. Clearly, all of these mushrooms must have speciated from a common ancestor. There are about twelve varieties; all have been utilized. Interestingly enough, in terms of fungal speciation, the center of fungal speciation in North America is around Grants Pass, Oregon. There are more mushroom species within 100

miles of Grants Pass, Oregon than almost anywhere on earth, and there are psilocybin-containing diminutive mushrooms — not coprophilic — but nobody but the most inspired anthropologists have ever been able to find any evidence for use of these hallucinogenic psilocybin-containing mushrooms in the Kwakwaka'wakw, Tsimshian, Tlingit complex of peoples. We don't know that they knew about this. One would assume, because we give Indians a lot of credit, that they knew a lot about their environment, and of course we have the evidence of their peculiar artistic style, which is X-ray vision — these are the people who show you the insides of things as well as the outsides — but in terms of usage or a claim of usage, it's never been substantiated.

This brings up an interesting point, because the plants I'm talking to you about today are plants with a history of shamanic usage, but there are hallucinogenic plants without a history of shamanic usage, plants that pharmacologically look like ideal candidates. Why weren't they used? A good example would be in the *Convolvulaceae*, the morning glory family, there is a group, *Argyreia*. There are 13 species of *Argyreia*, and they occur naturally from northern India to the Solomon Islands. They are woody morning glories; one that you may know is the Hawaiian baby woodrose. Well, the Hawaiian baby woodrose is a very powerful hallucinogen, weight for weight. It only takes 8 seeds of this thing to propel you into a fairly profound visionary state. There are some cardioactive glycosides present, but as we see with these ordeal poisons, that doesn't turn people off in other situations. *Argyreia* is unknown to have a folk usage, and yet looking at the flora of earth, this one of the first things that you would think that people might have looked at. Certainly, hippies in the 1960s and people since have made very good use of *Argyreia* as a visionary vehicle.

When I took it I had a quite anomalous experience. It was a standard psychedelic experience but the visionary episode was entirely — and this was in a room in Berkeley, there was no suggestion — the contents of the hallucinations were entirely based on the motif of the sea urchin. I was in huge dome rooms that were pale purple with these starlike things and these tit-like protuberances on everything and then this mauve floor and what looked to me like the pumpkin carriage from Cinderella, but it wasn't a pumpkin, it was a sea urchin vehicle of some sort, being drawn by these bizarre-looking creatures — they were like a cross between camels and giraffes — and they too were pale violet and had these tit-like protuberances all over their bodies. Nobody had ever said to me that Hawaiian baby woodrose had anything to do with the sea urchin motif, but it was pretty inescapable. I would have done more with that but I didn't like this cardioactive glycoside thing. In practical terms, what it meant was that in the first wave you just had to sit down and tell yourself that if you were having a heart attack you'd better get ready because there was nothing you could do about it, and it certainly was convincing. I don't know, maybe there are some medical people in the audience. It's always good to have a doctor around because they're so hard to alarm. I mean, I'll be ready to bury somebody and they will say, "Eh, he'll snap out of it in an hour or two." This person is absolutely rigid and unconscious and you're supposed to be calm about it because their pulse tells you it's alright.

Anyway, to say more about Mexico: coincident with this Sierra Mazatecan cultural area where all these mushrooms are being utilized, there is an overlapping and completely unrelated complex, also of great age and richness. This is the hallucinogenic morning glory group. Not the *Argyreias* that I've just been talking about, but morning glories in two other families: in the family *Ipomoea* and in the family *Turbina*. The *Ipomoea* is the one that you might be most familiar with. This is the Heavenly Blue morning glory that is the ornamental morning glory, an annual, and you can buy seeds in any decent seed store. It's been hybridized into three varieties, and it's amusing that they chose to name the original variety, which is pure sky blue — it is a magical plant, you don't have to take it, just to look at it this thing, and some of you may know Georgia O'Keeffe's paintings of these flowers — that one is called Heavenly Blue, and then it was hybridized into a blue and white one, which is called Flying Saucer, and then it was further hybridized into a pearly white, which is called Pearly Gates. So Heavenly Blue, Pearly Gates and Flying Saucer; and this is a wonderful hallucinogen. It has everything going for it. You can grow up a bunch of them in a long summer, and the plant really responds to care and water. I've grown them in a single summer forty feet up a double garage wall, and just filled it. Then you let them make seed and you cut down the mass of dried foliage and seed capsules and pound it over a sheet or a piece of plastic. It takes about 200 seeds to provide an unambiguous psychedelic experience. One of the really fascinating things about the Mexican morning glory seeds is the number of people who report Toltec and Mayan and Aztec imagery. I have experienced this myself; it's absolutely uncanny. It's like being at Teotihuacán at the height of that civilization, and the motif of the feathered serpent, all of this stuff is there. I don't know whether this is suggestion. When I took iboga I didn't think that I was in Africa, I didn't see the motifs of the Fang. This is an interesting area. I don't know how you do research in it, it's not empirical, but it is an interesting area. Why do the plants seem to have their own message?

The other Mexican morning glory is *Turbina corymbosa*, formerly *Rivea corymbosa*, and it is not an annual, it's a perennial. It's a little bush with small white morning glory-like flowers on it, and it is quite powerful. With the *Ipomoea* you have to take 200-300 seeds; with the *Turbina*, the ordinary dose is 13 seeds, and this would barely cover the bottom of a teaspoon. It's interesting that in the *Convolvulaceae* the concentration of the alkaloid is really quite intense. In both of these morning glories the active constituents are LSD-like compounds. LSD-25, the classic LSD that we all know, is active in the microgram range, in other words, 200 µg of LSD is considered a good dose. These naturally occurring ergotamine and LSD-like compounds have a more ordinary dose spectrum. They are active in the range, even purified, of ten to thirty milligrams. This is more typical of a drug. The activity of LSD is still a pharmacological miracle. You understand, do you not, that one microgram is one millionth of a gram, and that one milligram is one thousandth of a gram. It takes 1000 µg to make one milligram, so LSD is active at an unearthly intensity. This is why a guy could make six million hits in his garage, because the physical amount necessary for one human dose is literally microscopic.

Perhaps the floristic coincidence of the two morning glories, the many mushroom species, and then several minor psychedelics in this Sierra Mazatecan situation set the stage for the evolution of such an intensely hallucinogenic style of shamanism. Anthropologists differ as to whether people entered South America by going through the Caribbean Islands from the Yucatán and entered in the Suriname area, or whether people came down through the land bridge and across Panama and entered through Colombia. Current thinking is that they came through the Caribbean Islands, that this was an easier route. Now, down through those Caribbean Islands what we find are DMT cults using the seeds of leguminous trees. In fact, the major source of the snuffs of the Caribbean is a tree called *Anadenanthera peregrina*. In the deserts of northern Chile, in the Atacama Desert, they actually have found 4,500-year-old samples of DMT-containing snuffs. If any of you are interested in this, the anthropologist Manuel Torres and his wife have made this their life's work and have published on this a wonderful book showing the snuff trays of these Atacama people. They're beautiful, carved in wood, inlaid with shell and bone; they were the major high art that these people produced. Whether people entered South America through the Caribbean or in through Colombia, it's very clear that the experiences in Mexico gave them a complete shamanic armamentarium of hallucinogenic substances.

In the Amazon what they encountered was the most floristically complex environment on the planet. The thinking is that human beings arrived there somewhere between twenty and thirty thousand years ago, depending on the faction in anthropology that you align yourself with. What they found there that they had not known before was *Banisteriopsis caapi*, this malpighiaceae, woody vine that can attain up to 200 meters in length, which is approaching 600 feet. I've seen specimens of this thing as thick as my thigh where it came out of the ground. Clearly, a tree the size of this one was completely shrouded and hung with it, so that in estimating how much biomass you were looking at you would have to estimate it in metric tons of material. What these people discovered about *Banisteriopsis caapi* was that it was marginally psychoactive by itself — it is an MAO inhibitor, but not an overt hallucinogen — but they could combine it with plants containing DMT and they would become activated. It's interesting that this technological breakthrough involved in the combining of one plant with another to create an effective drug happens at the end of this long process of cultural peregrinations and migrations. In other words, up until that time, so far as we know, there were not drugs, there were plants which get you high. A drug is a combinatoric thing, where the phenomenon that pharmacologists call synergy, the causing of one thing to become more active by being in the presence of another thing, is being utilized. This must have been developed rather late in the search for avenues to psychoactivity in the Amazon. What's going on there is that DMT-containing plants, either *Psychotria viridis* in the *Rubiaceae* or *Diplopterys cabrerana* in the *Malpighiaceae* in Colombia, are being added into these *Banisteriopsis* brews and are significantly changing the experience.

Now, above and beyond that, a very complex folk pharmacology has been

put in place down there using what are called tertiary admixtures. This is a very rich area for anthropological research because these tertiary admixtures are often highly localized, and also very secret. This is the personal part of a shaman's repertoire: his admixture plants. If you can get these people to open up to you and share the identity of these admixture plants, almost invariably, when you get them back into the laboratory and perform tests on them with Dragendorff's reagent, they are alkaloid positive, they are chemically complex. In other words, this is not a bunch of shuck and jive, these people have an extreme sensitivity to the presence of exotic chemicals in the environment and they know how to track them down. It's been very fruitful in our work to spend a lot of time on the tertiary admixtures. These are the things which are in danger of being lost. Millions of people take ayahuasca in the Amazon; I venture to guess that it is the largest psychedelic religion on earth at this time. Over a vast area this is going on, but knowledge of these tertiary admixtures is fading fast and so is the availability of some of the plants.

If some of you are interested in this, write to my brother at the Stanford Department of Neurology. He published two review papers on admixtures to ayahuasca in which the species names are given, the taxonomic families and the identifiable chemical exotics are tabled there, and you can then see what a rich selection of psychoactive substances these people have to draw from. They claim that ayahuasca is not one thing, ayahuasca is many things, because we change it for the circumstance, we change it for the personality, we change it for the problem. I've come to think that this is quite true, that there is an entire medical system there, so at Botanical Dimensions, though we preserve all kinds of plants and have collectors in Thailand and West Africa and hither and yon, we've really put our attention on this one medical system because the evidence for its importance is the amazing balance, decency, dignity and integrity of these people. I am a cynic, I do not wax eloquent over the noble savage. Some of you have read my descriptions of my life among the Witoto, and I found them hard to put up with in some cases. It's not simply that if people are naked, they're beautiful — some naked people can be a real pain in the neck — but this ayahuasca complex is an ennobling folkway. These people have great heart and great sensitivity. They could get along fine at Esalen, these *ayahuasqueros*. You go into a village where this is happening and the women may cluster around you giggling because you're so funny-looking, all beet red and mosquito-bitten, but the shaman sees exactly who you are. He is not culture-bound in the same way.

In a way, this is a definition of shamanism. A shaman is a person who by some means has gotten themselves out of their own culture, so they can look back at it and manipulate its symbols, its beliefs, its expectations, its rituals to an end. If it's a negative end, then you have magic, *brujeria*, sorcery, witchcraft, but if it's an end which serves and maximizes reasonable social goals, then you have true shamanism. In addition to the ayahuasca complex, about which I know a great deal because I've concentrated on it, also in the Amazon there is a subcomplex of the datura phenomenon. Throughout the world the daturas are bushes, but as some of you may know there are ornamental tree daturas that are

a favorite with landscapers because they have these beautiful hanging flowers that shed scent in the evening. Well, all tree daturas originated in Peru and southern Colombia, in the subfamily of the daturas called *Brugmansia*. These are the arborescent daturas, and they have an exotic chemistry, even in comparison to the bush daturas. These are tropanes — hyoscyamine, L-hyoscyamine, scopolamine — and these are not true psychedelics. You may recognize the term scopolamine; this was the truth serum of Nazis in interrogation situations. It really isn't a truth serum, it just causes you to dissolve your boundaries so thoroughly that you babble incessantly, and if someone's willing to listen and they know what they're listening for you might spill the beans, but it isn't that you suddenly have a compulsion to tell the truth. If only such a thing were possible, who would need psychedelics?

The other complex that has been quite highly evolved in the Amazon, probably brought in by the Arawakan-speaking peoples who swept through the Caribbean, is the snuff complex. In the far east of the South American continent the snuff complex concentrates on the seeds of leguminous trees, *Anadenanthera peregrina*, *Anadenanthera macrocarpa*. These are not trees of the deep climaxed rainforest, they are trees more of the coastal and semi-arid regions, so as you go into the true climaxed lowland rainforest these snuff-using people had to find substitutes. They very cleverly found a very excellent substitute in the form of a family of myristicaceous trees — *Myristicaceae* is a family that includes nutmeg — of the genus *Virola*. They discovered that if you remove the bark of these trees before sunrise, when the sap is still in them, you can strip off these long, narrow pieces of bark and when you lay them on a low fire or a bed of coals the exudate, the sap, will rise up out of the inner cambium of the bark and bead up on the interior surface as what looks like blood. This is the resin of *Virola*, and this is a broad-spectrum source of psychoactive tryptamines. DMT occurs in it, 5-MeO-DMT occurs in it, other psychoactive, cardioactive and inactive tryptamines occur in it. It varies from species to species, and these *Virola* trees are outrageously difficult to identify. Even a taxonomist who has made this group his special field of study requires a handheld 50 power lens to make a species determination, because the species are determined by these little hairs on the underside of the leaf called trichomes. They're little hairs which come up and then split in three ways, and by the angle on the dangle you determine which *Virola* species you have in hand.

In 1980, my brother and I, a botanist from UBC and a fellow from Harvard all went down to the Rio Yaguas drainage, which is just over to Peru from Colombia, specifically to study this *Virola* complex, because we felt that it was in real danger of being lost in a hurry, that this was the fragile one. Some of you may know about the Waika or Yānomamö; these are peoples who use these *Virola* snuffs. The way you do it is that you pack a hollow tube with the ground-up seed dust, or in the case of the *Virolas*, the ground-up resin, and someone blows it into your nostril with the full force of their breath, and it's like being hit in the side of the head by a log. You scream, you fall over backwards, you salivate, and by the time you've gotten back up on your haunches and cleared the mucus out of your system, the tube has been reloaded and they do

your other nostril. Then you have an unambiguous intoxication, but it doesn't come anywhere near to being a DMT flash. This approach to the grail of the psychedelic experience is difficult with botanical materials; you have to take a lot and you have to have the correct phytopharmacological strategy before you ever begin. In my opinion, you can't approach the real center of the psychedelic experience with psychobotanicals unless you're doing a fair bit of psilocybin or a fair bit of ayahuasca, a committed dose, otherwise you'll just slice low.

I left out ergot; I'll say a little bit about it. Ergot is not used as a psychedelic anywhere in the modern world. Nevertheless, ergot is the source of LSD, and it is grown in Pakistan because ergotamine tartrate — which can be made into LSD — for many years was the preferred drug for migraine. As a migraineur I took a lot of it years ago. Migraine is a condition that is not well understood, but operationally it is a sudden uncontrolled vasodilation that allows too much blood pressure on the head and intense head pain. Well, ergotamine tartrate is a vasoconstrictor, and will just squeeze your veins down very small, and this is wonderful for migraine. You may have heard horror stories in the 1960s about people who took too much LSD and developed gangrene in their fingers and toes. This is possible, this is true; it's the vasoconstricting aspect of LSD. It's not related to its psychological effects, it is physically a strong vasoconstrictor. Ergot may have had a history of usage as a hallucinogen, because Gordon Wasson, Carl Ruck and Albert Hofmann argued fairly persuasively that ergotized beer lay behind the Eleusinian Mysteries. As you probably know, Eleusis was a cult site near Athens where every September for 2,000 years a great initiatory celebration was held in honor of Persephone's return from the kingdom of the underworld and her restoration to her mother. It was clearly a rite of hallucinogenic use of some sort, and Wasson-Ruck-Hofmann argued that it was ergotized beer.

I question this, because I think that there would have been more problems at Eleusis if it had been ergotized beer. Ergot is something not to mess around with. I mean, you could kill yourself in a big hurry with this stuff, and the notion that year after year beer could be brewed reliably that would intoxicate several thousand people at these ceremonies and there would not be any bad public relations about death or trembling or convulsions, this causes me to wonder. The proof of the pudding for the Wasson-Ruck-Hofmann theory would have been to go to the Eleusinian Plain, gather ergot from the wild rye and brew ergotized beer. Why not carry these experiments out? If we're confident in our theory, the proof of the pudding would be to do that. I wouldn't touch ergotized beer. I'd want to see a liquid gas chromatogram and infrared mass spectrophotometry data before I knocked back a pint of ergotized beer.

A small voice in opposition to this theory of Wasson-Ruck-Hofmann was the English poet and *bon vivant* Robert Graves. He believed that it was simply mushrooms, and his argument for this was that he took the list of ingredients that was used in the cult. There was actually a published list of ingredients and the ingredients were always listed in a certain order, and one of the ingredients was water. Graves argued that it's crazy in a recipe for beer to include water because you know that you're going to add water, so he argued that these words

were to be interpreted as an Ogham. An Ogham is when you have a list of words and you're supposed to take the first letter of each word in the list and it spells out a secret message, and Graves showed that the six ingredients always stated to go into the beer at Eleusis could be easily arranged so that their first letters spelled out the Greek word for mushroom, *μύκης*. It's not clear either way. In fact, the Eleusinian Mystery is quite mysterious, because if they were mushrooms all trace of them has died out, and there's not unambiguous iconographical representation of mushrooms. We have a few vase paintings where something small is being handed around, but to say with certainty that it's a mushroom isn't really playing fair.

Well, I wanted to run over this today with you and pretty much give it to you in one burst. This is really just to bring you up to speed. It's the kind of information that you should have under your belt if you're trying to make informed and intelligent decisions about your own spiritual growth in relationship to these things. Anybody who's interested in taking a new or an old drug, my advice is that the first stop should be the library. Find out as much as you possibly can. It's going to mean a lot to you when you get out there in the billows. I've had experiences where the shaman said, "Take this, but never shake the bottle," so then five years passed, and I'm trying to remember whether this guy said, "Take this, but never shake the bottle," or "Take this, but always shake the bottle." Well, having a background in pharmacology and ordinary scientific thinking, I decided that he must have said, "Always shake the bottle," because we want to agitate the stuff on the bottom and get it up into solution. I'm telling you, pay attention, because mistakes like this, if they don't kill you, can scare the socks off you. It's all in the details.

One last thought that I'll leave you with: I talked about the unclaimed nature of the *Argyreia* morning glories and how interesting it is to hypothesize possible hallucinogens, possible combinations that have never been used by people. An interesting one that was suggested recently that I want to do research on and find out more about, because I am puzzled by the *soma* problem and not really happy with any of the current answers, is reserpine, which occurs in *Rauwolfia serpentina*, an Indian tree. Reserpine is the first tranquilizer. It's pretty clear that reserpine works by inhibiting serotonin, that reserpine somehow competes with serotonin for its uptake, so you could combine reserpine with *Peganum harmala* or a psychoactive tryptamine. There are some on the Indian subcontinent; one of the most interesting ones is *Arundo donax*. Now this is a plant that really has a suggestive aura about it. We have no history of human usage of *Arundo donax* for visionary purposes. Nevertheless, it is the giant river reed of the Old World. To this day the reeds for reed instruments, for clarinets and piccolos, come from this plant; the very best ones are made from the shafts of the *Arundo donax* plant. Well, the roots of this plant contain large amounts of DMT. Think about the symbolism here: Orpheus was a god of music, Orpheus was a flutist, and Orpheus made a descent into the underworld in search of his beloved. The so-called Orphic strain in Greek religion is the magical, mystical, extramundane strain in Greek religion. It seems to me entirely reasonable to suggest that the old strata of the Orphic religion may be

pointing us toward looking at *Arundo donax* as a plant with a hallucinogenic potential whose efficacy was lost before the rise of literate Greek civilization.

So I don't want you to think that all mysteries have been solved and all work has been done in this area. It hasn't at all. The flora of Africa, the flora of eastern New Guinea, the flora of the Amazon, of Mexico, of what little forest remains in Africa, all of these areas may yield astonishing tools for spiritual and shamanic exploration when the cataloging and the phytochemical analysis is complete. There's a generation of work still to be done.