

ETB6,47

BOTANICAL MUSEUM LEAFLETS

HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, NOVEMBER 22, 1963

Vol. 20, No. 6

NOTES ON THE PRESENT STATUS OF *OLOLIUHQUI* AND THE OTHER HALLUCINOGENS OF MEXICO

BY

R. GORDON WASSON*

Piçietl, *peyotl*, *teonanacatl*, and *ololiuhqui*—these were the four great divinatory plants of Mexico at the time of the Conquest. We give the names in Nahuatl, the *lingua franca* of that time, spoken as a mother tongue by the Aztecs and many other peoples. By 'divinatory' we mean plants that served in Middle American cultures as keys to knowledge withheld from men in their normal minds, the keys to Extra-sensory Perception, the Mediators (as the Indians believed) between men and their gods. These plants were hallucinogens, psychotropic agents, psychotomimetics, if we must use the non-words of contemporary science.

Among the remote monolingual peoples of Mexico these plants continue to this day playing their divine role. Whenever the Indian family is troubled by a grave problem, it is likely to turn to one or the other of these plants and consult it according to the usage prevailing in the region. There were other drugs, certainly, that be-

* Research Fellow, Botanical Museum of Harvard University. This paper was written in honor of Robert J. Weitlaner on the occasion of his 80th birthday and will be published in Spanish in the *Homenaje* edited under the auspices of a committee headed by Dr. Alfonso Caso in Mexico City.

long to the same class, and of these more will be said later. But if we may rely on the number and quality of the witnesses, the importance that they attribute to these plants, and the strangely moving episodes that they tell us of the Indians' utter faith in and defense of them—then these four were preëminent.

The civilization of Europe had known nothing like these novel drugs of Mexico, at least not in recorded history. Similar miraculous powers were attributed, in a way, to the Elements in the Mass; and the Catholic Church in Mexico was quick to perceive this, to it, alarming parallel. But belief in the divinity of the Sacrament called for an act of faith, whereas the Mexican plants spoke for themselves. In a number of situations the record is clear: the friars conceded the miracles wrought by these agents¹ but attributed them to the machinations of the Evil One. Root and branch, the Church strove to extirpate what it called this superstition, this idolatry of the miracle-working plants. The Church was unsuccessful; just how unsuccessful can be seen from the fact that these plants are taken today, throughout the Indian country, in ceremonials invoking the very name of the Virgin Mary, of the Saints (especially St. Peter and St. Paul), of Our Lord. The accessories to the rite are sold in every market place, at a special stall, often in the shadow of the parish church. The miracle-working plants pass from hand to hand by private arrangement; they are never exposed like ordinary garden produce. The rite takes place in midnight vigils, sometimes accompanied by stirring age-old chants in the vernacular. The Indians attending these rites may include prominent lay officials of the church; rumor hath it that in certain places the priest is the leading *curandero*. Let it not be forgotten that the primary use of the sacred plants was and continues to be religious—and by the same token medicinal.

Religion and medicine have not yet been separated out in many of the Indian communities.

Piçietl — *Nicotiana rustica* L.

The bright green powder of *piçietl* leaves is familiar all over the Indian country in Mexico. The *curandero* rubs it on the skin, over the forearms, temples, stomach, legs. It is this that constitutes a *limpia* or ritual cleansing. Formerly, when mixed with one part of lime to ten of *piçietl*, it was made into a wad that the Indian inserted between teeth and gums and sucked, much as the Kechua sucks coca, to give him strength. The friars inveighed against *piçietl* with a vehemence that is proof of its importance in the native culture. It is still indispensable in the religious life of the Indians. Is it possible that *piçietl* has pharmacological properties not yet discovered by science? May there be surprises for us in this plant?

Piçietl is *Nicotiana rustica* L., a sister species to our ordinary tobacco, *Nicotiana Tabacum* L. They both grow in Mexico. In Nahuatl together they are *yetl*, the former alone was *piçietl* (now in the vernacular *pisiete*), the latter alone was *quauhyetl*. Tobacco was already widely diffused throughout the Americas at the time of the Conquest. The Spaniards found it in the Antilles, the Portuguese in Brazil, the English in Virginia. Along with the plant the Spaniards took the name 'tobacco' from the Taíno people of Hispaniola and Cuba. Long since dead and gone, this Arawakan tribe bequeathed to the world a legacy of important words that gives us an engaging image of a blameless people: 'canoe', 'hammock', 'tobacco', 'maize', and 'potato', not to speak of a sixth, 'barbecue', that is in vogue today. And so the Taínos, cultivating their maize and sweet potatoes, smoking tobacco in their hammocks, paddling their canoes to the neighboring barbecue, were destined to be extermi-

nated by the ferocious Caribs and the Europeans!²

The use of tobacco spread throughout the world with epidemic speed. European explorers penetrating to lands far distant in Africa and Asia sometimes found that tobacco had reached there before them. Even the Church did nothing to combat it,—outside of Mexico, that is. The French *abbé* with his snuff box is a familiar figure in Europe's cultural history.

Peyotl — *Lophophora Williamsii* (Lem.) Coult.

The history of *peyotl*, known to science as *Lophophora Williamsii* (Lem.) Coulter, has been utterly different but equally spectacular. A cactus,³ it is by that fact exclusively a New World plant, native to the arid regions of northern Mexico—to Coahuila, Zacatecas, San Luis Potosí, and Querétaro. Presumably the plant in colonial times grew only in the north, but its use extended south as far as the state of Oaxaca.⁴ Today the Indians of central and southern Mexico seem to know it no longer. But the Indians of the north still consume it in their religious ceremonies, and it is extending its range, inching its way northward from tribe to tribe in the Plains area until it has now finally reached Canada. In the same spirit of blind misunderstanding that actuated the Church in colonial Mexico, there are elements in the North American community that would invoke the police and courts to stop a practice that gives spiritual solace to our surviving Indian population.

On a different cultural plane, *peyotl* made its bow in the great world in 1888, when the toxicologist Louis Lewin of Berlin published the first paper attempting to classify it botanically and describing its sensational qualities. He was followed by Dr. S. Weir Mitchell (1896) and Havelock Ellis (1897), men who commanded wide attention in the English-speaking world.⁵ These papers

served to alert the scientific and learned world to a new order of vegetable product, and opened the sluice-gates to an astonishing flow of discussion and experimentation. Though a booster dose was hardly needed, Aldous Huxley gave the theme a new dimension when he published his *The Doors of Perception* in 1954 and *Heaven and Hell* in 1955.

The bibliography on *peyotl* is enormous: one North American anthropologist, Weston La Barre, has devoted an important part of his professional life to keeping up with it and chronicling current developments.⁶ The question presents itself seriously whether the output of articles can be laid solely to the scientific interest of a strange drug, or whether supplementing this there is a subjective effect that compels those who have eaten the plant to embark upon a mission to make known what they have experienced.

Peyotl (which has commonly been eroded to 'peyote') is a Nahuatl word. Alonso de Molina in his *Vocabulario* (1571) gives its meaning as *capullo de seda, or de gusano*, 'silk cocoon or caterpillar's cocoon,' which fits well the small woolly cactus that is its source. This is probably the explanation. Others⁷ cite a number of similar words in Nahuatl that invoke splendor or illumination. May these words not be secondary, having been born of the splendor of the visions that *peyotl* gives? For reasons that seem to have sprung from popular confusion, the English-speaking population of the Southwest came to call the dried *peyotl* 'mescal buttons.' Lewin, Mitchell, and Ellis, by their use of the terms, fixed this grievous misnomer in the English language. Later, when the active agent came to be isolated, the chemists called the alkaloid 'mescaline', thus compounding the mistake. 'Mescal' comes from the Spanish of Mexico *mexcal*, derived in its turn from Nahuatl *mexcalli*, the name for the agave,

maguey, or century plant from which pulque is made, which, when distilled, yields *mezcal*. *Mezcal* has nothing to do with 'mescal buttons' or 'mescaline'. This confusion is the lexicographers' nightmare, as can be seen in many English-language dictionaries where erroneous citations are given under the respective meanings of the word.

On the other hand there is an important *mejicanismo* that has largely escaped the lexicographers: *piule*, a generic name in Mexico for the hallucinogens. J. J. Santamaría traces it to Zapotec, in my opinion on insufficient grounds. I have heard it applied to hallucinogenic mushrooms among the Zapotec-speakers of the Sierra Costera, at San Agustín Loxicha: *piule de barda*, *piule de chers*, these being distinct species of such mushrooms, or simply *piule*.⁸ Does it not stem from *peyotl*, thus: *péyotl/péyutl* → *peyúle* → *piule*? As Dr. Aguirre Beltrán has shown us, in early colonial times *peyotl* was in use in Oaxaca. The present-day currency of the word among some monolingual Zapotecs might come down from that period.

Teonanacatl — 'God's flesh'

At least twenty-five of our early sources, many of them among our most important, speak of *teonanacatl*, 'God's flesh'⁹, the sacred mushrooms of Middle America. Bernardino de Sahagún refers to them repeatedly and at some length. He gives in Nahuatl the text of his native informants. Of the Nahuatl poems preserved for us, one mentions them, and probably others refer to them metaphorically. There are miniatures of them in two of the early codices. We in the 20th Century would have expected the European in colonial Mexico to try them out, to satisfy his curiosity as to their properties. There is no record of any such experiment. The Spaniards (if we may

judge by their words) at first rejected them with horror and loathing as an abomination, and in the ensuing centuries simply ignored them.

Such was this neglect that in 1915 William E. Safford, a North American economic botanist of established reputation, found it possible to read a major paper before a learned society, afterwards published in a respectable learned journal, denying that there had ever been sacred mushrooms in Mexico.¹⁰ Virtually no one challenged him. In a world indifferent to such matters, torn by warfare, his arguments won by default. Only a single thin voice was raised in persistent protest, the voice of Dr. Blas Pablo Reko, a Mexican citizen born in Austria of Slavic family background, a tireless and enthusiastic field worker but one given to fanciful theories and so not taken seriously.¹¹ He kept insisting not only that the mushrooms had existed but that the cult survived in places off the beaten track in Oaxaca.

Twenty years went by until, one day in 1936, Ing. Roberto J. Weitlaner got his hands on some of the sacred mushrooms in Huautla de Jiménez. He sent them to Reko, who forwarded them to Harvard, where they arrived in such a state that they could not be identified. On the record Ing. Weitlaner was the first white man in modern times to have seen the *teonanacatl*. Two years later, on July 16, 1938, his daughter Irmgard, with the young anthropologist who was destined to become her husband, Jean Bassett Johnson, together with two others, Bernard Bevan and Louise Lacaud, attended a mushroom rite in Huautla, in the home of José Dorantes. Johnson later gave a full account of the event.¹² So far as the sources go, they were the first white persons to attend such a ceremony.

One month later, in mid-August, the Harvard botanist Richard Evans Schultes, also in Huautla, received from

native informants specimens of three species that they said were of the sacred class. He took them back to Cambridge. His field notes describe with unmistakable precision the species that was to be defined in 1956 by Roger Heim as *Psilocybe caerulescens* Murr. var. *mazatccorum* Heim.¹³ Dr. David Linder, Harvard mycologist, confirmed another as *Panaeolus campanulatus* L. var. *sphinctrinus* (Fr.) Bresad. Some time later the third species was identified at Harvard by Dr. Rolf Singer as *Stropharia cubensis* Earle,¹⁴ but he did not disclose his discovery, not even to Schultes, until many years later when it was too late to serve a purpose.

Then the Second World War supervened. Johnson was killed in North Africa in 1942. Reko died in 1953. Schultes' activities were diverted to other geographical regions. The outside world had been on the brink of discovering the Mexican mushrooms, but the war blanketed everything and the mushrooms slipped back into the well of the forgotten.

Meanwhile the matter was being approached from an altogether different angle in New York, by the Wassons, husband and wife, who had spent more than two decades gathering data on the role of mushrooms in primitive societies in Eurasia. This theme in anthropology, which we called *ethnomycology*, had never before been explored in the West. Eurasia embraced so many cultures and so much history and literature that we had resolved early in our inquiries to stop with Eurasia and leave Africa and the Americas to others. Our Eurasian studies had led us to formulate a bold surmise: viz., that mushrooms had played a religious role in the lives of our remote ancestors, a role far more important than the world had supposed. We were still preoccupied with this idea when in September 1952, suddenly, we learned that a mushroom cult had been reported in 16th Century Mexico.

On receipt of this, to us, sensational news, we resolved to embark upon a quest for surviving traces of that cult. At the time we knew nothing, absolutely nothing, about the cultures of Middle America. What awaited us in Mexico turned out to exceed our most sanguine anticipations, in the intellectual adventure of discovering for ourselves the rich Indian cultures of Middle America and in our rediscovery of the rite of the sacred mushroom.

In the beginning we discovered Ing. Roberto J. Weitlaner. Without minimizing what we owe to others, I rejoice that this occasion presents itself when I may properly define my debt to him. He led us by the hand on our first excursion on muleback into the Indian country, to Huautla de Jiménez; on my second trip to Mazatlán de los Mixes; then on my visits to San Agustín Loxicha in the Sierra Costera, and to the Mazahua country. For ten years I have had repeated recourse to him, to tap his immense knowledge of the Indians, their ways, their languages, their history. He has guided my steps in the libraries, unearthed apt quotations in the sources bearing on our theme, introduced me to others working in the field who could also pin down facts. His patience, good humor, and *joie de vivre*, in the Sierra and in Mexico City, are unfailing. But above all else I have tried to learn from him his secret of dealing with the Indians. The Indians are simply living by the conventions of an orally transmitted culture such as our own forebears lived by only a little while ago. When you visit their villages you make allowances for this time lag. You do not treat them kindly as inferiors or children. You do not treat them *as though* they were equals. The Indians are quick to see through such fronts. Ing. Weitlaner taught us to treat the Indians *as equals*—a secret simple yet elusive. As the poet said, truly 'this is the famous stone that turneth all to gold'.

The news of the Mexican sacred mushrooms burst upon the world in the spring of 1957 with the publication of our book, *Mushrooms Russia & History*, and our articles in the popular magazines.¹⁵ Roger Heim, Membre de l'Institut, Director of the Muséum National d'Histoire Naturelle, visited the Indian country of Mexico three times in response to our invitation, seeking out the sacred mushrooms. He identified fourteen species belonging to three genera—*Psilocybe*, *Stropharia*, and *Conocybe*—besides a number of subspecies. Most of them were new to science, although they had been known to the Indians for centuries, probably millennia. Dr. Albert Hofmann in the Sandoz laboratories of Bâsle undertook the delicate task of isolating the active agents, defining their molecular structure, and finally synthesizing them. By 1958, a surprisingly short time, he had accomplished his work. Many investigators began to study the properties of *psilocybine* and *psilocine*, as Dr. Hofmann called the active agents, and their possible use. In a recent bibliography I have listed some 200 papers on work with these mushrooms that have already appeared, in the past five years, in learned and scientific journals;¹⁶ not to speak of the hundreds of articles that have come out in a score of countries in the lay press. Here again there seem to be signs that those who have experienced the mushrooms feel a compulsion to impart to others the staggering effects of *teonanacatl*.

Pipiltzintzintli — *Salvia divinorum* Epling & Jávito

Though *teonanacatl* has been rediscovered and identified, there still remain other plants classed with it in the colonial sources as possessed of divine (or Satanic) attributes that defeat our efforts at interpretation. Both Sahagún and Juan de Cárdenas refer to a plant that they call respectively *poyomatli* or *poyomate*,¹⁷ grouping it with

other hallucinogens. Its identity is unknown. In his *Medicina y Magia* Dr. Aguirre Beltrán cites other references to this plant in the unpublished records of the inquisition. He likewise supplies numerous references to a second plant that belongs in the divinatory group, a plant the name of which is variously spelled in his sources but that he thinks in the original Nahuatl should be *pipiltzintzintli*.¹⁸ Its identity, too, is unknown. The plant grew in the area where *ololiuhqui* flourished; but whereas *ololiuhqui* is the seed of a morning glory, the seed of *pipiltzintzintli* is never mentioned. It is called an *hierba*, never an *hiedra* or *bejuco* like the morning glory. There was a *macho* and an *hembra*, or male and female varieties. It was cultivated.

All of these attributes fit the *hojas de la Pastora* that the Mazatecs generally use as a divinatory plant. In September 1962 we gathered specimens of the *hojas de la Pastora*, and they were found to be a species new to science: Epling and Játiva named it *Salvia divinorum*.¹⁹ Among the Mazatecs I have seen only the leaves ground on the *metate*, strained, and made into an infusion. The colonial records speak of an infusion made from the roots, stems, and flowers. But this is not incompatible with our information about *Salvia divinorum*: the Mazatecs may confine themselves to the leaves of a plant that has the divine virtue in all its parts. I suggest that tentatively we consider *pipiltzintzintli*, the divine plant of pre-Conquest Mexico, identical with the *Salvia divinorum* now invoked in their religious supplications by the Mazatecs.

Of divinatory plants in use today that could have been used in Middle America before the Conquest, we have had experience with two: *toloache*, presumably the seeds of *Datura meteloides* Dun., and *colorines*, the seeds of *Rhynchosia pyramidalis* (Lam.) Urb. Though I know of



Flowering *Salvia divinorum* E. & J., 'hojas de la Pastora', held by Irmgard Weitlaner Johnson, 1962.

Photo by Wasson

no references to *colorines* in colonial sources. I think that they are present in the famous Tepantitla fresco where strings of seeds and mushrooms are falling from the hand of Tlaloc, and where some of the seeds are red and black, with the hilum distinctly placed in the red field.²⁰ On the slopes of Popocatepetl the sacred mushrooms are still taken with *colorines*. It is vital that the hilum be in the red field; if it is in the black patch, it is the toxic seed of *Abrus precatorius* L., also called *colorines* and much used for beads by the Veracruzanos.

Ololuhqui — *Rivea corymbosa* (L.) Hall. fil.*

* There have recently been suggestions that the correct name of *ololuhqui* is *Turbina corymbosa* (L.) Raf.

These suggestions arise from two articles which have appeared in the past several years: Roberty, G.—“Genera Convolvacearum” in *Candollea* 14 (1952) 11-60; Wilson, K.A.—“The genera of Convolvulaceae in the southeastern United States” in *Journ. Arn. Arb.* 41 (1960) 298-317.

Roberty separates *Ipomoea*, *Rivea* and *Turbina*, putting the three into different subfamilies. He keeps in *Rivea* only one species of India and Ceylon. In *Turbina*, he has three species: *T. corymbosa* (which he states occurs in tropical America, the Canary Islands and the Philippines) and two other species of Mexico.

Wilson, in a key to the genera of Convolvulaceae in the southeastern states, separates out *Turbina* as a genus distinct from *Ipomoea*. While *Turbina* is keyed out as a distinct genus, there is no technical consideration of it in the body of the paper which follows the key. One, consequently, must assume that *Turbina* (as conceived by Wilson) does not occur in southeastern United States. There is, furthermore, no reference to the binomial *Turbina corymbosa* as such. Wilson pointed out that: “Generic lines are difficult to draw in this family, and treatments vary with different authors depending upon the emphasis placed on the taxonomic characters used. . . .”

The question of whether to use the binomial *Rivea corymbosa* or to assign the concept to *Ipomoea* on the one hand or *Turbina* on the other is, in effect, one of personal evaluation by botanists of the importance of characters.

When I first discussed *ololuhqui* in 1941 (Schultes, R.E.: “A contribution to our knowledge of *Rivea corymbosa*, the narcotic *ololuhqui* of the Aztecs” (1941)), I looked into the problem of the generic

position of the concept. I decided that, if indeed one were justified in separating this concept from *Ipomoea*, it must be accommodated in *Rivea*. The outstanding Argentinian specialist on the Convolvulaceae, the late Dr. Carlos O'Donell, who was spending a year at Harvard University at that time, worked with me closely in this study and was in complete agreement. I have studied this problem again in connection with Wasson's recent work and see no reason to change my opinion. Furthermore, it is clear that such an authority as the late Professor E. D. Merrill referred this concept to *Rivea*, placing *Turbina* in synonymy under *Rivea* and *T. corymbosa* in synonymy under *R. corymbosa*.

In view of the fact that such authorities as O'Donell and Merrill elected to use *Rivea corymbosa*; that Wilson acknowledges that "the entire family is in need of intensive study and . . . all characters must be thoroughly re-evaluated"; that Roberty's article is hardly conservative and actually adds little to our basic knowledge of the family; and that the ethnobotanical and chemical literature has accepted *Rivea corymbosa*—in view of all these circumstances perhaps we might well continue to use the best known name until a really comprehensive study by a recognized specialist indicates that it is wrong.

Rivea corymbosa (L.) Hallier *fl.* in Engler Bot. Jahrb. 8 (1893) 157.

Convolvulus corymbosus Linnaeus Syst. Nat. Ed. 10, 2 (1759) 923.

Ipomoea corymbosa (L.) Roth Nov. 11. Sp. Ind. Orient (1821) 109.

Turbina corymbosa (L.) Rafinesque Fl. Tellur. 4 (1838) 81.

—R. E. SCHULTES

The least known in the outside world of our quartet of major Mexican divinatory agents is *ololiuhqui*;† yet it is perhaps the best known and most widely used among the Indians of that country. In the race for world attention *ololiuhqui* has been a slow starter. Beyond the confines of the Sierra Madre few except specialists have heard of it, and the bibliography on it is short. But its properties are as sensational as those of *teonanacatl* and *peyotl*. Its identity was settled in 1941. The enigma of its chemistry was resolved in 1960, when on August 18 of that year Dr. Albert Hofmann read his paper in Australia

† Although the spelling *ololiuqui* has gained wide acceptance and is now the commonest orthography, linguistic evidence indicates that this Nahuatl word is correctly written *ololiuhqui*.

before an audience of scientists, many of whom were plainly incredulous, so astonishing were his findings.²¹ In this number of the *Botanical Museum Leaflets* he himself rounds out and completes his discoveries, and I shall not anticipate them here.

Ololiuhqui in Nahuatl is the name of the seeds, not of the plant that yields the seeds. The word means 'round thing', and the seeds are small, brown, and oval. The plant itself is a climber, called appropriately *coaxihuítl*, 'snake-plant', in Nahuatl, and *hiedra* or *bejuco* by the Spanish writers. It is a morning glory, and it grows easily and abundantly in the mountains of southern Mexico. Unlike *teonanacatl*, it bears seed over months and the seed can be kept indefinitely, and carried far and wide, to regions where the plant itself does not grow. In Spanish it is commonly known as *semilla de la Virgen*, and in the various Indian languages there are names for it that should be carefully assembled by teams of linguists and then studied for their meanings and associations. In Oaxaca, only among the Triqui of Copala have I found no familiarity with it.

Past experience has shown that for a divinatory plant to enlist the attention of the outside world two steps are usually necessary. First, it should be correctly and securely identified. Second, its chemistry should be convincingly worked out. Richard Evans Schultes settled the identity of *ololiuhqui* in the definitive paper published in 1941.²² It is the seed of a species of *Convolvulaceae*: *Rivea corymbosa* (L.) Hall. fil. Schultes was not the first to link *ololiuhqui* with this family, but for decades there had been disputes over its identity, and since Schultes published his paper there has been none. The starting point for any student of the subject is Schultes's paper.

It is not my intention here to tell over again the story told by Schultes. I will only supplement what he had to

say with this observation. In the writers of the colonial period *ololiuhqui* receives frequent mention, especially in the *Tratado* of Hernando Ruíz de Alarcón. Throughout these references there runs a note of sombre poignancy as we see two cultures in a duel to death,—on the one hand, the fanaticism of sincere Churchmen, hotly pursuing with the support of the harsh secular arm what they considered a superstition and an idolatry; on the other, the tenacity and wiles of the Indians defending their cherished *ololiuhqui*. The Indians seem to have won out. Today in almost all the villages of Oaxaca one finds the seeds still serving the natives as an ever present help in time of trouble.

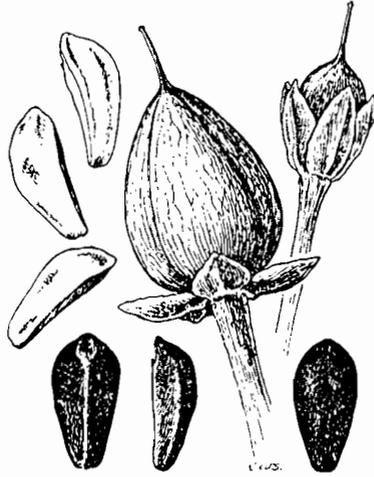
*Tliltliltzen — Ipomoea violacea L.**

Since the appearance of the Schultes paper in 1941, and apart from the chemical findings of Dr. Hofmann, there has been only one important contribution to our knowledge of the morning glory seeds. In 1960 Don Tomás MacDougall published his discovery that in various parts of Oaxaca, especially in the Zapotec area, another seed is used exactly as *ololiuhqui* is.²⁸ This is the seed of a second morning glory, *Ipomoea violacea* L. In Zapotec *ololiuhqui* is known currently as *badoh*; the

*Taxonomically, the genus *Ipomoea* is extremely difficult. The binomial *Ipomoea tricolor* has already crept into the limited literature that has grown up in connection with this second kind of *ololiuhqui*. Inasmuch as some confusion may result in the use of two names—*Ipomoea tricolor* and *I. violacea*—we should point out that, after a study of plant material and the taxonomic history of these binomials, I am in agreement with the American specialist in the Convolvulaceae, H. D. House (House, H. D.: "The North American species of the genus *Ipomoea*" in Ann. N.Y. Acad. Sci. 18 (1908) 259), that both names actually refer to one polymorphic species. In this case, then, the older name is *Ipomoea violacea* L. Sp. Pl. (1753) 161 which should be used in preference to its synonym *I. tricolor* Cav. Ic. Pl. Rar. 3 (1794) 5, t. 208.—R. E. SCHULTES

second seed is *badoh negro* or *badungás*, the full Zapotec equivalent of *badoh negro*. The black seeds are long and somewhat angular. In Nahuatl they could hardly be called *ololiuhqui*, since this term means the 'round things' or 'pellets'.

The Nahua must have known them: what then did they call them? We believe the answer is to be found in Pedro Ponce's *Breve Relación de los Dioses y Ritos de la Gentilidad*, Par. 46, where he speaks of *ololiuhqui*,



Capsule and seed of *Ipomoea violacea*, enlarged two and one half times.

peyote, and *tlitliltzin*, all with the same magnetic properties. The third, possibly a hapax in the corpus of surviving classic Nahuatl documentation, is clearly not *ololiuhqui*, since both are mentioned in the same sentence as distinct products. The word comes from the Nahuatl root meaning 'black', with a reverential suffix. May we not assume that this was the name current in classic Nahuatl for the black seeds that Don Tomás found in wide use among the Zapotecs in the 1950's? Apparently there is a further reference to *badoh negro* in the records of the Inquisition: a Negro slave who was also a *curandero* used

the term *ololiuhqui del moreno*, which Dr. Aguirre Beltrán thinks was his way of saying 'black *ololiuhqui*'. But since this Negro was obviously a stranger both to Nahuatl and to Spanish, little can be deduced from his terminology.²⁴

According to Don Tomás, in San Bartolo Yautepac, a village of the Sierra Costera, only the black seed is used, but in many villages both kinds are known. The black is widely regarded as the more potent. In some places the black seed is called *macho*, 'male', and the men take it; the *Rivea* seed, known as *hembra*, 'female', is for the women. The dose is often seven or a multiple thereof—seven, or 14, or 21; or the seeds are measured in the cup of the hand; or, as one informant in the Sierra Mazateca told me, one takes a beer-cap full of *Rivea* seed.

In recent years a number of experimenters have taken the *Rivea* seeds with no effects, and this has led one of them to suggest that the reputation of *ololiuhqui* is due wholly to auto-suggestion.²⁵ These negative results may be explained by inadequate preparation. The Indians grind the seeds on the *metate* (grinding stone) until they are reduced to flour. Then the flour is soaked in cold water, and after a short time the liquor is passed through a cloth strainer and drunk. If taken whole, the seeds give no result, or even if they are cracked. They must be ground to flour and then the flour soaked briefly in water. Perhaps those who took the seeds without results did not grind them, or did not grind them fine enough, and did not soak the resulting flour. The chemistry of the seeds seems not to vary from region to region, and seeds grown in the Antilles and in Europe are as potent as those grown in Oaxaca. I have taken the black seeds twice in my home in New York, and their potency is undeniable.

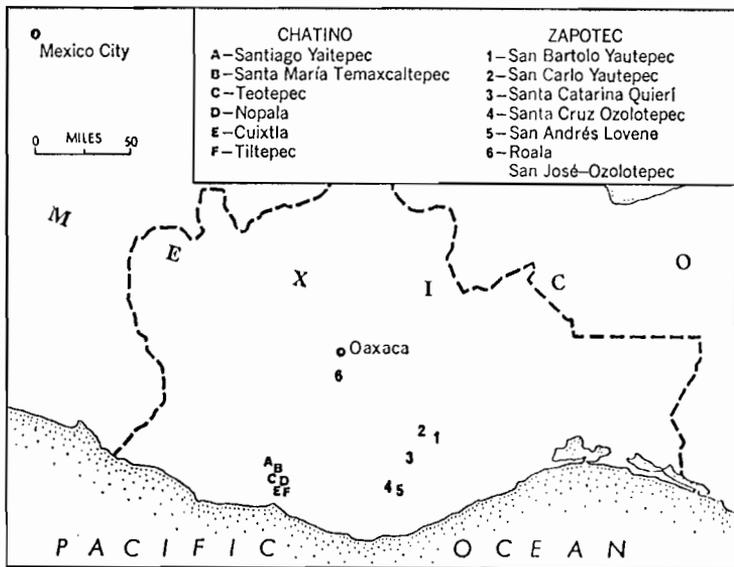
Don Tomás MacDougall and his colleague Francisco Ortega of Tehuantepec, both old and excellent friends



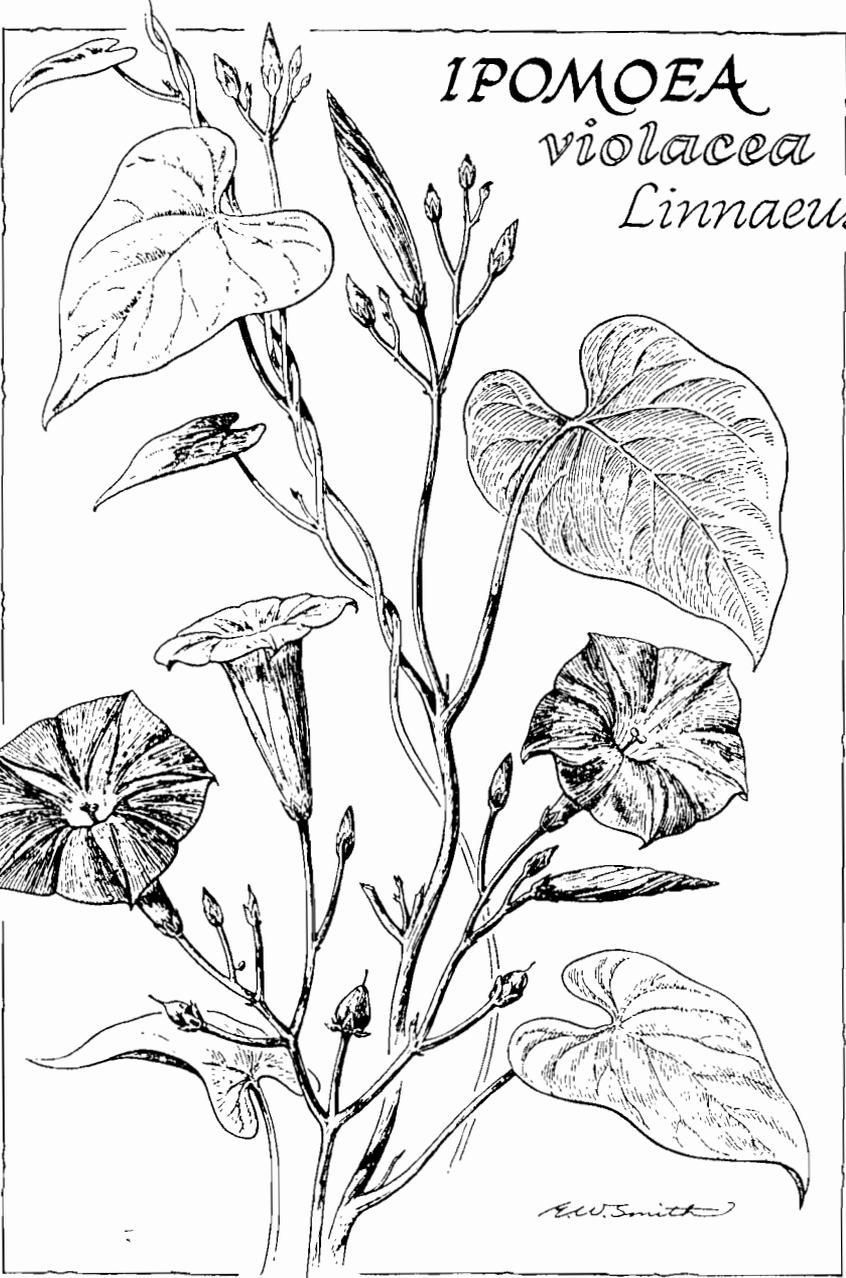
Ipomoea violacea

Photo by WASSON

of Ing. Weitlaner, have given us permission to use their notes and photographs for this article. We publish for the first time a map showing the villages in Oaxaca where they have found the *Ipomoea* seeds in use, a group of seven Zapotec villages visited by Don Tomás, and also six villages in the Chatino country visited at my express request by 'Chico' Ortega in 1962, as we had a suspicion that the black seed was used in that linguistic area.²⁶ The area of diffusion is certainly far wider than these villages, but this is a start.



The black seeds are called variously in the Zapotec country: *badoh negro* seems to be the prevalent name. But in the Zapotec dialect spoken in San Bartolo Yautepec they are called *la'aja shnash*, 'seed of the Virgen'. In this town Francisco Jiménez ('Chico Bartolo') took a series of photographs in the course of a routine vigil. A relative of his, Paula Jiménez, is a *curandera*, and she officiated, and also dictated an account of the steps taken in the rite. We give a paraphrase of what she said.



IPOMOEA
violacea
Linnaeus

Drawn approximately one-half natural size.

Drawn by ELMER W. SMITH

First, the person who is to take the seeds must solemnly commit himself to take them, and to go out and cut the branches with the seed. There must also be a vow to the Virgen in favor of the sick person, so that the seed will take effect with him. If there is no such vow, there will be no effect. The sick person must seek out a child of seven or eight years, a little girl if the patient is a man, a little boy if the patient is a woman. The child should be freshly bathed and in clean clothes, all fresh and clean. The seed is then measured out, the amount that fills the cup of the hand, or about a thimble full. The time should be Friday, but at night, about eight or nine o'clock, and there must be no noise, no noise at all. As for grinding the seed, in the beginning you say, 'In the name of God and of the Virgencita, be gracious and grant the remedy, and tell us, Virgencita, what is wrong with the patient. Our hopes are in thee.' To strain the ground seed, you should use a clean cloth—a new cloth, if possible. When giving the drink to the patient, you must say three Pater Nosters and three Ave Marias. A child must carry the bowl in his hands, along with a censer. After having drunk the liquor, the patient lies down. The bowl with the censer is placed underneath, at the head of the bed. The child must remain with the other person, waiting to take care of the patient and to hear what he will say. If there is improvement, then the patient does not get up; he remains in bed. If there is no improvement, the patient gets up and lies down again in front of the altar. He stays there a while, and then rises and goes to bed again, and he should not talk until the next day. And so everything is revealed. You are told whether the trouble is an act of malice or whether it is illness.

The photographs illustrate the *curandera's* account of a ceremony invoking the divine power of the morning glory seeds. A feature of this recital is the child who serves the beverage. He (or she) is ritually cleansed, a symbol of purity. I encountered this practice for the first time in 1960, in the Mixteca, in the Valley of Juxtlahuaca, when Robert Ravicz and I were looking for survivals of the mushroom cult. The mushrooms were to be gathered by a virgen, they were ground on the *metate* by a virgen.²⁷ In 1962, in Ayautla and also in San José Tenango, in the Sierra Mazateca, again a maiden ground the leaves of the *Salvia divinorum*. Here then is a general pattern, whether in the Sierra Mazateca, or among the



(Left) Paula Jimenez, *curandera* of San Bartolo Yautepec, making infusion of *Ipomoea violacea* seeds. 1959.
(Center) Child serving the infusion to patient, with incense burner. (Right) Patient taking infusion of *I. violacea* seeds, to be enlightened as to the cause and cure of his malady. Photos by CHICO BARTOLO

Mixtecs of the Valley of Juxtlahuaca, or among the Zapotecs of San Bartolo Yautepec, for the preparation of the divinatory agent, either the seeds of the morning glory or the mushrooms or the *hojas de la Pastora*. (Had we been warned in advance to look for this, perhaps we should have discovered the same custom in other regions, visited in years previous to 1960.) Suddenly it dawns on us that a deep-seated harmony exists between the role of the child in preparing the divine agent and the names circulating throughout the Nahuatl area for the sacred mushrooms themselves: we have found them called *los niños*, 'the children', and *los hombrecitos y las mujercitas*, 'the little men and the little women', and *los señoritos*, 'the lordlings.' Marina Rosas, *curandera* of San Pedro Nexapa, on the slopes of Popocatepetl, called the sacred mushrooms in Nahuatl *apipiltzin*, 'the noble princes of the waters', a singularly appropriate name, in which the prefix 'a' conveys the sense of 'water'. And here we revert to the miraculous plant that we think is the *Salvia divinorum*, called (as we believe) in Nahuatl *pipiltzintzintli* in the records of the Inquisition dating from 1700. This is obviously related to the name for the sacred mushrooms used by Marina Rosas. Dr. Aguirre Beltrán translates it as 'the most noble Prince' and relates it to *Piltzintli*, the young god of the tender corn. In the accounts of the visions that the Indians see after they consume the sacred food — whether seeds or mushrooms or plant — there frequently figure *hombrecitos*, 'little men', *mujercitas*, 'little women', *duendes*, 'supernatural dwarfs'. Beginning with our maiden at her *metate*, here is a fascinating complex of associations that calls for further study and elaboration. For example, are these Noble Children related perchance to the Holy Child of Atocha, which gained an astonishing place in the hearts of the Indians of Middle America? Did they seize on this



(Top) Young girl grinding sacred mushrooms (*Psilocybe mexicana* Heim) in Juxtlahuaca, Oaxaca, in Mixteca), 1960. (Bottom) Young girl grinding *Salvia divinorum* leaves, Ayautla, Sierra Mazateca. Sept. 1962.

Photos by WASSON

Catholic image and make it a charismatic icon because it expressed for them, in the new Christian religion, a theme that was already familiar to them in their own supernatural beliefs?

The tradition of the *doncella* at the *metate* is of venerable age. Jacinto de la Serna, writing his *Manual para Ministros* toward the middle of the 17th Century, said in his Chap. XV:3 about *ololihqui* and *peyotl*:

como para algunas medicinas es menester molerlo, dicen que para que haga éste effecto à de ser molido *por mano de doncella*.

Nor is this citation unique. An Indian afflicted in his nether limbs was told to take *pipiltzintzintli*:²⁸

que la había de beber *molida por una doncella*, desleida en agua tibia, en ayunas, habiendo confesado y comulgado antes de tomarla y ayunado viernes y sábado y el día siguiente beberlo en el nombre de la Santísima Trinidad y de la Virgen de Guadalupe y de San Cayetano . . . y que el aposento había de estar muy abrigado, sin luz, ni aire, ni ruido, y que no se había de dormir, sino estar en silencio aguardando a ver dichas figuras (un viejecito vestido de blanco y unos muchachos pequeñitos vestidos del mismo color) que ellas lo untarian y desengañarían si tenía remedio su mal o no.

What an extraordinary recapitulation of the salient features of the divinatory ritual as practiced in Middle America! There is the interweaving of Christian elements and pagan. There is the maiden grinding the divine element, and the preparation of the suppliant, confessing and communicating before he consults the Mediator. There is the sheltered spot,—protected from sound and light. There is the consultation on an empty stomach. There is the clear intimation as to what one sees: a little old man clothed in white and little boys garbed in the same. Finally there is the august pronouncement whether the affliction of the suppliant can or cannot be remedied. All these features are always present, regardless of the divinatory plant that is consulted.



Two views of mushroom stone in Namuth collection; early pre-classic, B.C. 1000-500. The figure emerging from stipe is believed to be that of a young woman before *metate* or grinding stone. Note her breasts. *Photos by HANS NAMUTH*

Perhaps there is testimony far older than the colonial records of the Inquisition. In the collection of Hans Namuth of New York is a 'mushroom stone' of extraordinary features.²⁹ The cap of the mushroom carries the grooved ring that, according to Stephan F. de Borhegyi, is the hallmark of the early pre-Classic period, perhaps 1000 B.C. The stone comes from the Highlands of Guatemala. Out of the stipe there leans forward a strong, eager, sensitive face, bending over an inclined plane. It was not until we had seen the *doncella* leaning over a *metate* and grinding the sacred mushrooms in Juxtlahuaca in 1960, that the explanation of the Namuth artifact came to us. The inclined plane in front of the leaning human figure must be a *metate*. It follows that the face must be that of a woman. Dr. Borhegyi and I went to see the artifact once more: it was a woman! A young woman, for her breasts were only budding, a *doncella*. How exciting it is to make such a discovery as this: a theme that we find in the contemporary Mixteca, and in the Sierra Mazateca, and in the Zapotec country, is precisely the same as we find recorded in Jacinto de la Serna and in the records of the Santo Oficio. Again it is precisely the same, if our interpretation of the silent witness in the New York studio of Mr. Namuth be correct, as in a stone carving that dates back perhaps 2,500 years!

NOTES

Abbreviations:

AGN: Archivo General de la Nación, ramo Inquisición.

AB: Gonzalo Aguirre Beltrán: *Medicina y Magia*, 1955, Mexico.

(A thoughtful monograph with numerous quotations from AGN, indispensable for every student of its subject.)

1. *Vide, e.g.*, AGN, vol. 340, folios 354-359.
 2. The Caribs were also called Canibs or Calibs. From 'Canib' the English-speaking world derived 'cannibal', which is preferred by it to 'anthropophage'. Shakespeare in his *Tempest* took his foul monster Caliban from the 'Calibs'.
 3. There is a well known sentence in Sahagún, Bk. X, Chap. XXIX, 2, that is usually read as follows: 'Hay otra hierba como tunas de tierra que se llama peyotl . . .' According to Professor Charles E. Dibble, the Florentine Codex, folios 129v-130r, reads thus: 'Ay otra yerva, como turmas de tierra, que se llama peyotl . . .' *Turmas* is a Spanish word of ancient lineage and obviously makes sense. It was more familiar in Mexico in Sahagún's time than now. *Vide* Joan Corominas: *Diccionario Critico Etimológico de la Lengua Castellana*, entry *turmas*.
 4. AB, Chap. 7, Area Cultural and Foco de Difusión.
 5. a) Lewis Lewin: 'Über Anhalonium Lewinii', *Arch. für experim. Path. und Pharma.*, 24:401: 1888. In translation this article also appeared in the same year in the *Therapeutic Gazette*, London. In these initial articles there was a misunderstanding about which species of cactus *peyotl* was.
b) Havelock Ellis: 'A Note on Mescal Intoxication.' *The Lancet*, No. 3849. June 5, 1897.
c) S. Weir Mitchell: 'Note upon the Effects of Anhalonium lewinii.' *Brit. Med. Journal*. Dec. 5, 1896.
- After their initial papers these three authors continued writing on the subject in books and articles. Lewin in his 1888 paper did not report on human experiences with *peyotl*: the first such report appeared in *The Therapeutic Gazette*, on Sept. 16, 1895: 'Anhalonium Lewinii (Mescal Buttons). A study of the drug, with especial reference to its physiological action upon man, with report of experiments', by D. W. Prentiss and Francis P. Morgan.
6. *Vide* Weston La Barre: 'Twenty years of peyote studies', *Current Anthropology*, Vol. 1, No. 1, Jan. 1960.
 7. AB, Chap. 7, Etimología.

8. *Vide* V. P. Wasson and R. G. Wasson: *Mushrooms Russia and History*, Pantheon Books, N.Y., 1957, pp. 311, 313, and 315.
9. 'Teo' means 'god' in Nahuatl; no Nahuatl word is more richly documented than this. The resemblance to the Latin and Greek word for 'god' is one of those fortuitous convergences of sound and meaning that occur in language studies. Given the multiplicity of languages in the world and the limited number of sounds that the human voice can utter, they are inevitable. 'Nacatl' means 'flesh', and 'nanacatl' is used for mushroom, a plural form of the word for 'flesh'. This interpretation of the word was accepted from the beginning: three early colonial sources take it for granted. No modern Nahuatl scholar disputes it.
10. 'Identification of the Teonanacatl, or "Sacred Mushroom" of the Aztecs, with the narcotic cactus, *Lophophora*, and an account of its ceremonial use in ancient and modern times', an address delivered May 4, 1915, before the Botanical Society of Washington. Published as 'An Aztec Narcotic (*Lophophora Williamsii*)' in *Journal of Heredity*, Vol. 6, July 1915.
11. For Reko references *vide* my bibliography on the hallucinogenic mushrooms published in the Botanical Museum Leaflets, Harvard Univ., Sept. 7, 1962, Vol. 20, No. 2, Entries 144-147. Second edition, with corrections and addenda, March 10, 1968, No. 2a.
12. 'The Elements of Mazatec Witchcraft', Gothenburg Ethnographical Museum. *Ethnographical Studies* 9, 1939, pp. 119-49. Also 'Some Notes on the Mazatec'. Lecture before Sociedad Mexicana de Antropología, Mexico, Aug. 4, 1938, published by Editorial Culture, 1939. In both papers Johnson speaks of the Mazatec practice of consuming an infusion of a plant known as *hierba María* for divination purposes. This is surely the plant that we have called *hojas de María*, 'leaves of the Virgen Mary', and that has lately been named *Salvia divinorum* Epling & Játiva: we suppose it is the *pipiltzintzintli* of Colonial Nahuatl. Incidentally Ing. Weitlaner discovered a Mazatec informant in the Chinantla who gave him the most extensive testimony about this plant that we had had until it was identified in 1962. See 'Curaciones Mazatecas', AINAH, Vol. IV, No. 32, 1949-50.
13. *Vide* Harvard Botanical Museum Leaflets, Feb. 21, 1939, Vol. 7, No. 3, p. 38 ftnt.
14. *Vide* Roger Heim and R. Gordon Wasson: *Les Champignons Hallucinogènes du Mexique*, Archives du Muséum National d'Histoire Naturelle, Series 7, Vol. VI, p. 184.
15. *Vide* above, Note 8. Also 'Seeking the Magic Mushroom', *Life*, May 13, 1957; International Edition, June 10; 'En Busca de los Hongos Mágicos', *Life en Español*, June 3. Also 'I Ate the Sacred

- Mushroom', by Valentina P. Wasson, *This Week*, May 19, 1957.
16. *Vide* Harvard Botanical Museum Leaflets, Sept. 7, 1962, Vol. 20, No. 2; also second edition, with corrections and addenda, March 10, 1963, No. 2a.
 17. Sabagún: X:24:27. Juan de Cárdenas: De los problemas y secretos maravillosos de las Indias, Mexico, 1591, folio 243v. Also AB: Chap. 5, Note 9, and Chap. 7, Note 97.
 18. AB: Chap. 5, *Pipiltzintzintli*.
 19. Harvard Botanical Museum Leaflets, Dec. 28, 1962. Vol. 20, No. 3. Carl Epling and Carlos D. Jativa-M.: 'A New Species of *Salvia* from Mexico.
 20. V. P. Wasson and R. Gordon Wasson: *Mushrooms Russia and History*, pp. 324-6; also Plate LIV. Also Roger Heim and R. Gordon Wasson, *Les Champignons Hallucinogenes du Mexique*, Chap. III, Fig. 15 bis.
 21. 'The Psychotropic Active Principles of *Ololiuqui*, an ancient Aztec Narcotic', lecture delivered at the IUPAC Symposium on 'The Chemistry of Natural Products', in Melbourne, August 18, 1960.
 22. 'A Contribution to our Knowledge of *Rivea corymbosa*, the narcotic *ololiuqui* of the Aztecs', published by Botanical Museum of Harvard University, Cambridge, Mass., 1941.
 23. Thomas MacDougall: '*Ipomoea tricolor*: A Hallucinogenic Plant of the Zapotecs', published in Boletín del Centro de Investigaciones Antropológicas de México, No. 6, March 1, 1960.
 24. AB: Chap. 6, El Complejo del Ololiuhqui, Para. 7. The author did not know of the use of *Ipomoea* seeds when he published his book; in fact, he associated *ololiuhqui* with the *Solanaceae* rather than the *Convolvulaceae*. He explained the blackness of the seeds as an attribute caused by age.
 25. For example, V. J. Kinross-Wright: 'Research on Ololiuqui: The Aztec Drug.' *Nuero-Psychopharmacology*. Vol. 1. Proc. 1st. Inter. Cong. of Nuero-Pharmacology, Rome, Sept. 1958. pp. 453-56. Also 'Das Mexikanische Rauschgift Ololiuqui,' by Blas Pablo. *El México Antiquo*. Vol. III. Nos. 3/4. Dec. 1934. pp. 1-7; especially p. 6. But for a powerful reaction see Humphrey Osmond: 'Ololiuqui: the ancient Aztec Narcotic,' published in *Jour. of Mental Science*, Vol. 101, No. 424, July 1955.
 26. *Vide* R. Gordon Wasson: 'The hallucinogenic fungi of Mexico: An inquiry into the origins of the religious idea among primitive peoples.' Harvard Botanical Museum Leaflets, Vol. 19, No. 7, Feb. 1961., pp. 152-3, fnt., last sentence.

Chico's visit to the Chatino country served a dual purpose. In *Beyond Telepathy* (Doubleday, N.Y., 1962) Andrija Puharich on

p. 20 had said this: 'The author was also informed by certain Brujos among the Chatino Indians (living in Southern Caraca) that they used the *Amanita muscaria* for hallucinogenic purposes. The proper dose is one-half of a mushroom.

If true, this would be sensasional. It is not true. *A. muscaria* is the hallucinogenic mushroom of the Siberian tribesman in their rites. It is not used in Mexico.

When we first began visiting the Indian country of southern Mexico, we were expecting to find that the hallucinogenic mushroom there was *A. muscaria*. For ten years we have combed the various regions and we have invariably found that it played no role in the life of the Indians, though of course it is of common occurrence in the woods. We had visited the Chatino country, where we were accompanied by Bill Upson of the Instituto Linguistico de Verano, who speaks Chatino. Later he likewise helped Puharich, but he informs us that no *brujo* in his presence testified to the use of a mushroom answering to the description of *A. muscaria*. After the Puharich statement had appeared, I gave Bill a photograph in color of *A. muscaria*, and he returned to Juquila and Yaitepec. An informant named Benigno recognized the mushroom at once and identified the stage of development that it had reached, as would be expected of a countryman intimately familiar with his environment. He said the people in his area do not take that kind of mushroom. Chico Ortega is a Zapotec Indian of mature years, keen intelligence, high sense of responsibility, and vast experience throughout the villages of the State of Oaxaca. In the summer of 1962 I sent him, with the color photo, to sound out Chatino villagers as to the use they made of it. Discreetly, he went from village to village. The results were uniformly and unanimously negative.

Puharich in *The Magic Mushroom* as well as in his most recent book is unduly impressed with the occurrence of *A. muscaria*. Wherever the species of trees occur with which it lives in mycorrhizal relationship, it is common. It is one of the commonest of fungi in North America and Eurasia. Puharich quotes at length as an authority Victor Reko, a notorious *farceur*, not to be confused with his cousin, Blas Pablo Reko.

Puharich does not identify the spot where he met his *brujos*, though it seems probable that he did not get beyond the mestizo town of Juquila. He does not identify his *brujos*. He does not explain how he put his question to them, how he explained over a double linguistic barrier what *A. muscaria* looked like. He does not explain what precautions he took to avoid a leading question that would almost certainly produce his desired answer.

27. *Vide* Robert Raviez: 'La Mixteca en el Estudio Comparativo del Hongo Alucinante.' AINAH, Vol. XIII, 1960 (1961), pp. 78-92; see pp. 79, 80, 86.
28. AB: 'La Familia de los Solanos,' ftnt. 45.
29. It is important to note that the nine miniature mushroom stones found at Kaminaljuyu, Guatemala, and reported by Borhegyi, 1961, figure 1, were found in a sealed cache together with nine miniature legless *metates* accompanied by *manos*. The fact that the *metates* were found together in association with the mushroom stones indicates the possibility that they were used together in ceremonials, probably for crushing or grinding mushrooms or ololihqui seeds.

(Stephan F. de Borhegyi: 'Miniature Mushroom Stones from Guatemala', *Amer. Antiquity*, Vol. 26, No. 4, pp. 498-504, April 1961.)