Mexican Phantastica—
A Study of the Early Ethnobotanical Sources on Hallucinogenic Drugs

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INTRODUCTION

The use of drugs which affect the higher cerebral functions was in the heritage of every civilization. The most commonly known of such substances were intoxicating liquors, produced by alcoholic fermentation from a wide range of materials. The Egyptians obtained buza, the precursor of beer, from barley; the Japanese saké from rice; the Europeans wine from grapes; the Aztecs pulque from agave; the Incas chicha from maize; and even the Australian eolithic cultures managed to obtain an intoxicating drink from eucalyptus leaves.

Drugs which produced mental stimulation were also used in every civilization, frequently as a complement to diet and always intimately related to social patterns: tea has been used from time immemorial in Asia, coffee in the near East, kola in Africa, maté in South America and cocoa in Central America, all of which were found to improve mental and muscular performance in the individual. Their use accounted for the great care exercised in the cultivation, processing, and commerce of these substances which achieved considerable economic importance. Yet man has always lived under the stress of pain and anxiety, and it might be said that these twin factors have influenced man’s actions more than any other. Hence the discovery of natural drugs such as opium, capable of at once abolishing physical pain and of relieving anxiety, became endowed with immense cultural significance in the Old World.

On the other hand, the civilizations of the New World possessed a long tradition of natural drugs which affect the mind by stimulation of sensorial perceptions, thus imparting a new cosmic dimension to the individual. Long before the arrival of the Spaniards in ancient Peru the use of coca was well established and its effects were clearly distinguished. In other areas of South America inhaling cohoba snuff infusions and imbibing of yagé were common among aboriginal tribes seeking to induce hallucinations. However, of all the American civilizations Mexico was the cultural horizon with the greatest variety of phantastica drugs.

THE ETHNOLOGICAL QUEST

Ethnological research aimed at establishing the medical uses of such natural products as are shown to be constant elements in the development of a civilization has proved to be a valuable approach in the search for new drugs. Some cultural groups in Mexico retain their botanical lore even though old traditions have been largely replaced by new customs. The oral tradition of these peoples and their use

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of herbs for medical and religious purposes is so persistent that the field-worker may still study them at first hand in outlying communities, despite the fact that hallucinogenic drugs have been driven underground by centuries of doctrinaire religious prejudice and contemporary health legislation.

It is no easy matter to organize field research for specimen collection with the object of establishing definitively the botanical characteristics of a complete plant, and obtaining sufficient quantities of the active part for chemical and pharmacological assays. In some instances more than a century elapsed from the time a plant was initially described to the eventual collection of a flowering specimen. Sometimes the season would be too short, the terrain too difficult, or perhaps inadequately reconnoitred. More often than not the cultural barrier between the field-worker and the aboriginals could not be overcome and a waiting period would be necessary to win their confidence. The field-work once completed, the laboratory studies, given the complexities of plant chemistry, are routine standard pharmacology tests for activity.

The survey of early documents is a much more reliable method of ethnobotanical research than modern pharmacological techniques have been inclined to credit, and if properly used such a survey may provide the correct answer to a long search. Historical documents on hallucinogenic drugs are by far more accurate than modern treatises, because they were written when the use of Phantastica was flourishing among the aboriginal communities, and such studies were the result of first hand observations made by some Spanish natural philosophers. The most detailed accounts were written by members of the Holy Inquisition or other religious orders perturbed by the uncanny powers of drugs employed by the American Indians for purposes of divination, treatment of disease or as part of their religious practices, and the Inquisition's procedure on heretical matters required the rigour and detail of legal documents. Incidental references may sometimes be found in some candid historical accounts, in addition to a few instances encountered in codices of Indian origin.

The unparalleled historical riches of Mexico, both in pre-Columbian codices and colonial chronicles, call for both a deep-rooted cultural background and a broad knowledge of available literature. Contemporary writers on Mexican Phantastica have merely scratched the surface of such repositories of material, either overlooking or confusing the important texts, and a systematic survey was therefore essential. Nevertheless it would be unrealistic to expect a ready identification of natural drugs merely by the synonymity of an old Nahuatl name and that used in current taxonomical works. On account of such procedures much confusion has resulted in research on Mexican Phantastica during the last half century, and some publications have, for example, dealt with fungi instead of cacti, and vines instead of seeds, thus retarding sound pharmacological studies for many decades. The survey of early documents is a guide-post to medical history, and should be complemented by the appropriate field and pharmacological work.

**HISTORICAL SOURCES**

The Mexican civilizations left the only pre-Columbian records written before European arrival, the Maya codices being hieroglyphic and the remainder pictographic. Both types of codices are extremely difficult to interpret, though the
FIG. 1. *Codex Magliabecchi* f.78 [90]
Fig. 2. *Codex Magliabecchi* f.71 [83]
FIG. 3. Codex Magliabecchi f.72 [84]
pictograph for *pulque*, the Aztec alcoholic drink, is quite easy to identify in their codices. The Mayas seemed to have been much more moderate in their use of drugs than the Aztecs, and their philosophical approach to life and more peaceful traditions may account for the mere identification *pulque* or *balchih*-drinking among the Maya, with perhaps the limited use of *ololiuhqui* known among them by the name of *xtabentum*. The Aztecs lived under more stress and their dominion extended over areas of more varied climatic conditions; the central plateau where a creeper, the *oloiuhiqui*, and various herbs such as *toluah* grew, the subjugated northern deserts yielding cacti such as *peyotl*, and the humid tropical lands of the south where several types of *teonanacatl* mushrooms could be gathered. Among the Aztec codices there are two which were written after the Spanish conquest and which refer to hallucinogenic drugs.

The so-called *Codex Badianus* was written in 1552 by Martin de la Cruz, an Indian herb physician, and translated from the Nahuatl into Latin by Juan Badiano of Xochimilco, near Mexico City. In this manuscript there are repeated references to *toluah*, plants of the *Datura* family known to produce hallucinations. The codex includes three coloured pictures of the Mexican species recommended for treatment of certain painful ailments, but there is no mention of its use for hallucinogenic purposes nor were *peyotl*, *oloiuhqui* or *teonanacatl* described, probably because the book was dedicated to the Emperor Charles V, as a therapeutic monograph.

The *Codex Magliabecchi*, written on European paper c. 1565, is of the coloured pictographic variety and of Aztec origin, having notes in Spanish and also containing an account of Mexican rites and superstitions. It has already been reported that on f.78 (fig. 1) the Indian artist depicted an Aztec in the act of eating mushrooms with Miclatantecuhtli, lord of the land of the dead, standing in the background. The pictograph may be interpreted as meaning either that the god spoke through the mouth of the drugged person or that the god appeared at the end of the hallucinatory dream, to drag the mushroom eater into the Mictlan or land of the dead. It has not previously been noted that the *Codex Magliabecchi* includes two other plates of considerable importance for the history of hallucinogenic drugs. On f.71 (fig. 2) are depicted two plants, vines or creepers, on two serpents which can only be interpreted as the Nahuatl rebus writing for *ololiuhqui coatlxihiuitl*, or *coatlxoxouhqui*, from *coatl* serpent or twin *xihuitl* herb and *xoxouhqui* green thing. Thus, the plate of the *Codex Magliabecchi* which is a part of the sequence of feasts and rites, refers to the identification and glyph for *ololiuhqui* and their use is depicted on f.72 (fig. 3). In the latter plate, two Indians face the plant and appear to ingest some materials while at the same time the glyphs for words are marked at their mouths being signs of the divinatory speech induced under the hallucinatory effects of *ololiuhqui*.

More abundant information on Mexican Phantastica is to be found in colonial Spanish chronicles. The earliest account, not hitherto reported, was written by an anonymous Franciscan friar at the Convent of Saint Mary of the Conception in Teozaan [i.e. Tehuacan] and dated 1541. Evidence in the text, published by Lord Kingsborough in 1848, points to Sahagún as its author. A detailed description of the intoxication induced by the *teonanacatl* mushrooms is given (Chapter II), in addition to an account of their appearance, and reference to the kind of hallucinations which resulted.
Bernardino de Sahagún⁴ [1499–1590], a Franciscan friar, wrote a General history of the things of New Spain which survives as three different manuscripts and which is the basis of our knowledge on ancient Mexicans. The First Memorials or Tepepulco MS. [1558–1560], the Tlatelolco MS. [1560–1565] and the Tenochtitlan MS. [1565–1568] contained very important information gathered from Mexican herb physicians in each of the localities after which the manuscripts have been named. There are some differences in the text of the last two manuscripts, but in both of them the information afforded is remarkable. In describing the Aztecs or Mexicans (Book X, chapter XI) Sahagún mentioned “lewd youngsters” who were in the habit of eating certain mushrooms. Also, when recording the ancestry of the Aztecs (Book X, chapter XXIX) the author credited the Chichimec Indians with having discovered the hallucinogenic actions of peyotl and teonandcatl. Furthermore Sahagún devoted a whole section of his treatise on herbs (Book XI, chapter CII, #1) to a description of the plants capable of producing madness; so accurate was his study that every drug now experimentally shown to induce hallucinations can be found in his treatise: oloiuuhqui, peyotl, tlapatl, mixitl, teonandcatl, tochtetepo, atlepatl, aquiztli, tenxoxoli, and quimichaptli.

At the end of the sixteenth century two historians mentioned in passing the use of teonandcatl or hallucinogenic mushrooms. Diego Durán⁵ [1537–1588], a Dominican friar, in the History of the Indies of New Spain, which was not published until 1867, mentioned that on the occasion of the annual feast of revelations the Aztec emperor invited his most distinguished guests to a celebration at which the mushrooms in question were eaten after the sacrifices. Fernando de Alvarado Tezozómoc⁶ [c. 1530–1590], grandson of Moctezuma, in his Mexican Chronicle published by Lord Kingsborough in 1848, also wrote that the Mexicans collected certain mushrooms to celebrate the coronation of King Ahuitzotl.

José de Acosta⁷ [1540–1600], a Jesuit who in 1590 published a Natural and Moral History of the Indies, is better known for his description of the coca and its use among the Peruvian Incas; but he also visited Mexico in 1586 and included in his book the earliest account of the effects of oloiuuhqui and its use in the course of some religious ceremonies (Book V, chapter 26) to induce hallucinations and control fear.

Francisco Hernández [1517–1587] was sent by Philip II between 1570 and 1577 to investigate the materia medica of Mexico. The Natural History of New Spain which he wrote at the end of his mission stands out as the most excellent renaissance work in the New World. In his original study, Hernández described most of the drugs capable of producing hallucinations and gave detailed botanical characteristics, together with an account of their effect on humans and their medical uses. Several versions of Hernández’s work are known: Nardo A. Recchó,⁸ a physician at the Spanish court, condensed and glossed the Hernández manuscript, and his summary was published in Rome with some woodcuts by the Academy of Lincei from 1628 to 1651, in a number of different issues. Recchó’s Latin summary was also used by Juan E. Nieremberg⁹ [1595–1658], a Spanish Jesuit who published it in his Historia Naturae printed in 1653. Prior to the Lincei and Nieremberg editions, Francisco Ximénez¹⁰ [1560–c. 1620], a Dominican friar, had translated, further condensed, and glossed Recchó’s summary from Hernández and published a Spanish translation in Mexico in 1615. It was the botanist C. Gomez Ortega¹¹ [1740–1818] who finally found the complete text of Hernández on Mexican plants which he published in
1790. Because of the confusion in some recent papers it should be emphasized that only Gomez Ortega's edition of 1790 contains all the hallucinogenic drugs of Mexico described in Hernandez's original manuscripts, because Reccho's summary, subsequently used by Ximenez, the Lincei, Nieremberg and modern authors, only covers twelve of the twenty-four botanical books written by Hernandez. In this way many sections were omitted such as the description of peyotl. Hernandez described with his usual reliability nandcatl, ololiuhqui, peyotl, tlépaltl, nacazcol, tototaztin and others. The reason for the omission of these drugs by the copyists may be found in a remark made by Ximenez (Book II, part I, chapter XIV), referring to ololiuhqui, "... it would be better not to reveal where this plant grows, and it would be wise not to write about it for it should remain unknown to the Spaniards".

Juan de Cárdenas [1563–1609], a Spanish physician who arrived in Mexico when he was very young, published a book on The Problems and Marvellous Secrets of the Indies in Mexico 1591; he devoted the whole of the last chapter to discussing whether there was witchcraft in some herbs and the action of peyotl, poymatl, ololiuhqui, and piciehl or tobacco. Cárdenas's analysis of the problem for the first time discredited supernatural forces, explaining illusions and mental stimulation, and gave accurate description of the pharmacodynamics of these natural drugs. This included degradation in the stomach, intestinal absorption, distribution throughout the body and specific action upon the brain. A clear differentiation was made among the physiological effects of these drugs, grouping them under three headings: changes in perception, induction of sleep of a non-relaxing nature, and the stimulation of hallucinatory reaction so characteristic of these drugs. A slight alteration to the Aristotelic vocabulary used by Cárdenas gives to his study an up-to-date presentation.

Other physicians practising in Mexico during those years were not so explicit as Cárdenas. Augustín Farfán [1532–1604], a Spanish physician who became an Augustinie friar in Mexico, in his Brief Treatise on Medicine published in Mexico, 1592 (Chapter XVI, f.205) recommends the application of ololiuhqui to alleviate the pain during attacks of gout. Juan de Barrios [1563–c. 1615], also a Spanish physician, who published in Mexico, 1607, the book True Medicine, Surgery and Astrology, included a section of the plants recorded by Hernandez in which ololiuhqui is mentioned (Treatise IV, f.60v and 65) in the form of an ointment, and also that the ololiuhqui seeds, when ingested, stimulate sexual desire.

After the sixteenth century Mexican Phantastica became the concern of the Catholic Church. Fr. Martín de León, in his book Road to Heaven, printed in Mexico 1611, appears to be the first to include questions about the use of these drugs among those to be put by the priest to the penitent in confession. Shortly afterwards the Holy Inquisition of Mexico issued a proclamation on May 8th, 1616, ordering the persecution and excommunication of those who, under the influence of herbs and roots, lost their senses and induced hallucinations to foresee the future. Hernando Ruiz de Alarcón [c. 1583–c. 1640], brother of the celebrated Mexican writer, deserves a special place among the religious writers on Phantastica during the eighteenth century. After travelling through central and southern Mexico in order to gather all the superstitious beliefs of the Indians he wrote in 1629 a Treatise of the superstitions of the Indians of New Spain, which was published by del Paso y Troncoso in 1892. This work is a reminder of Sahagún's method and is
of considerable medical interest. Peyotl, ololiuhqui and picietl or tobacco are mentioned several times and there are also two chapters devoted to a discussion of the superstitions and hallucinogenic effects of ololiuhqui.

Other references appeared in The Confessional in Mexican Language by B. de Alva, published in Mexico 1634, in which the questions referring to ololiuhqui and peyotl appeared both in Spanish and in Nahuatl. P. Sanchez de Aguilar published in 1639 an Information regarding worshippers of idols in Yucatan with very scanty data on the Mayas, apart from mention of instances where women added "witchcraft" to the chocolate so that the men should lose their senses. But this is so generalized and ambiguous as to put it on a par with all other vague denunciations of witchcraft so prevalent in that day and age.

There are at least three eighteenth century books, written by missionaries in the northern area including territory now part of the United States of America, which mention the use of peyotl among the Indians. The Franciscan friar José Arlegui published in his Chronicle of Zacatecas 1737, the ceremony of peyotl and the effects of this cactus. José Ortega [1700–1768], a Jesuit, also gave a good account in 1754 of the peyotl ceremony in his Missionary efforts in Nayarit, Sonora, Sinaloa and California. Finally there is a Manual for the administration of the Holy Sacraments, published in Mexico 1760 by P. Bartolomé García, for use among the Texan Indians, in which, in addition to the confessional question about the use of peyotl is one about the use of "frijolillo" or little beans, which is probably a reference to ololiuhqui.

PHARMACOLOGICAL RESEARCH

The ethnobotanical lore on hallucinogenic drugs remained cloistered in the secret practices of the Mexican Indians until the experimental work of Louis Lewin [1850–1929] on peyotl became widely known in 1924 by the publication of his book on Phantastica. Lewin coined this word for the hallucinogenic drugs, but included in that monograph analgesics, anaesthetics, narcotics and even stimulants. Of the Mexican drugs he mentioned only peyotl, ignoring or confusing the rest; in spite of this, experimental studies with mescaline, one of the constituents of peyotl, and clinical observations in normal individuals and mental patients were stimulated. Auto-observation like those published by Alexandre Rouhier or the ill-timed one by Aldous Huxley gained universal interest for this group of drugs.

The exhaustive screening of historical sources for Phantastica from 1939 received a considerable boost when a close friendship was established with the learned aboriginal botanist J. Trinidad Perez Nol which greatly expanded the possibilities of field-work. Samples were obtained of the natural, hallucination-producing drugs found in Mexico and enough information on this subject was gathered to substantiate in 1951 a chapter entirely devoted to drugs stimulating higher cortical functions in our textbook of pharmacology, including mescaline from peyotl, banisterine and harmine from other hallucinogenic plants of South America, and even cannabinol from Indian hemp. Further knowledge was obtained later through personal work with Blas P. Reko, who practised medicine among the Chinantec and Mazatec Indians of Mexico, and had provided the information for the journalistic monograph published by his cousin, Victor A. Reko. The chemical and
pharmacological aspects of mescaline derivatives were also studied with Gordon A. Alles, and during those years most people who began to be interested in this field were either contacted or corresponded with. As a result of their encouragement, in 1954 a monograph was published in cooperation with a student, H. Olivera, entitled *Phantastica Plants of Mexico*, establishing definitively the identification, botanical characteristics, habitat and pharmacological actions of teonandcatl, marihuana, canela, chicalote, adormidera, colorin, loco, peyote, sinicuiche, coztiezapotl, ololiuhqui, camotillo, toloache, coca, banisteria and cohombrillo. Up to that time, with the exception of the poppy, coca, Indian hemp and banisteria growing in other areas, only the peyotl had been accepted among pharmacologists as having hallucinogenic properties. The findings of Stoll showing the powerful hallucinogenic effects of LSD lysergic acid diethylamide obtained from ergot—which was also mentioned in the monograph—were years later related to the interesting field-work of Valentina and R. Gordon Wasson. Their book on *Mushrooms, Russia and History*, published in 1957, confirmed with self-experiments the hallucinogenic effects of teonandcatl we had previously reported; the mycological identification made by Heim with the Wassons enlarged the number of mushrooms to be found in Mexico which produced hallucinations. Chemical analysis of the different teonandcatl proved to have psilocybin and psilocin, related to LSD, as their active constituents. Finally Hofman and Cerletti reported that from the seeds of ololiuhqui three main crystalline compounds had been isolated: 

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d\text{-lysergic acid amid, } d\text{-isolysergic acid amid and chano-clavin},
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with very powerful hallucinogenic properties. Therefore the active constituents of ololiuhqui were proved to be chemically related to the ergot alkaloids well-known in Europe, and at the same time resembling the molecular structure of the active hallucinogenic principles found in the Mexican mushrooms of the teonandcatl group.

The effects of these natural drugs found in Mexico differ from one another due to their differences in chemical constitution; and it should also be pointed out that they differ, too, with the individuals, personality, emotional state, environment, and the associated use of another drug, for instance, alcohol. The similarity between clinical psychosis and the conditions simulated by chemical stimulation of the brain with these drugs was also indicated; the chemical structure of serotonin has confirmed these ideas, both phenomena having a similar chemical substratum.

The consumption of up to ten or twelve teonandcatl mushrooms, after a period of slight muscular unco-ordination or inebriation, gives rise to a feeling of well-being and enjoyment, explosions of laughter, and the well-publicized coloured visions in three dimensions, followed by a deep sleep. As was reported doses of over fifty mushrooms are said to produce intense intoxications and permanent madness. Also when peyotl is ingested a feeling of well-being and visual hallucinations of a coloured nature are produced; some of them may be based in the remote past, others apparently cannot be related to any experience. Mental concentration is difficult and external stimulations are transformed into mental hallucinations. The changes in personality, feeling of immaterialization and psychological effects may vary considerably. Observations with the ololiuhqui have been the subject of controversies due to the potency and activity of the natural drug. The ingestion of the seeds produces hallucinations varying according to the type of stimuli received by the subject.
All three drugs, *teonandcatl*, *peyotl* and *ololiuhqui* have been and still are used for purposes of divination among the indigenous population of Mexico. The experimental tests carried out with these drugs on extra-sensory perception are extremely interesting and seem to support some of the traditional uses. The effects of *cannabinol* and related compounds present in *Indian hemp*, on the perception of time, those of *banisterine* and *harmine* of the *yagé* on hallucinations, of *cocaine* in the *coca*, of *morphine* in *opium* and other drugs not peculiar to Mexico although also found there, have been very well described for other areas.

**COROLLARY**

The survey of the ancient literature of Mexico in codices and chronicles provided sound and reliable information about the use of certain natural drugs which produce hallucinations. Besides the group of the *toloatzin* of the *Datura* family, three plants have now been confirmed as pharmacologically active: *peyotl* a cactus, *teonandcatl* a group of mushrooms, and *ololiuhqui* a creeper or vine. Chemically, but for *mescaline* of which the structure is slightly different, the active principles of the Mexican Phantastica are related to the lysergic acid present in ergot, which was responsible for the epidemics of religious hallucinations in ergotism or *ignis sacer*, also known as Saint Anthony's fire, which ravaged Europe during the Middle Ages. There are several drugs mentioned in the historical sources previously discussed which deserve further experimental research. The divination heritage which has been assigned to these materials might also be worth further parapsychological studies. Chemical variations in the molecular structure of *mescaline* suggests that the spectrum of action of these Mexican drugs can be enlarged and their action on the higher functions of the brain modified extensively.

The rediscovery of this buried lore among the codices and ancient chronicles of Mexico and its pursuit both in remote Indian villages and in the laboratory, has been an exciting adventure. However, the passage of this pharmacological legacy of the New World into the indiscriminating hands of Western civilization, already unable to cope with its own drug problems of alcoholism and narcotics, must be regarded with apprehension.

**REFERENCES**

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7. **José de Acosta.** *Historia natural y moral de las Indias.* 535 pp. J. de León. Sevilla (1590).
Mexican Phantastica


APPENDIX

Pertinent texts from the references quoted


They had another method of getting drunk which made them more cruel; this was by means of some small mushrooms that grow in these lands as they do in Castille, but those of this country are such that, eaten raw (and because they are sour, honey is taken with or after them) the consumers would shortly afterwards see a thousand visions, particularly snakes; and as they lost their senses it would seem to them that their legs and body were filled with maggots which ate them alive, and in this state, half mad, they would go out of doors begging someone to kill them, and in this condition of bestial intoxication . . . it sometimes happened that they choked, and also they became very cruel to other people; these mushrooms are called, in their language, *teunanacatlth*, which means flesh of God, or of the devil whom they worshipped; and in this way, through this bitter foodstuff, their cruel God gave them communion.

The lewd youth is mad. He is a sot who drinks raw wine and becomes drunk, foolish and dejected. He eats mushrooms which make him demented, restless and dissolute. He is shameless, presumptuous, lewd, tattling, wicked, vile, brutish and brazen. He is impudent, vain, proud, debauched, vicious and promiscuous, a libertine who exhausts himself by a life devoted to pleasure.


They also had a wide knowledge of herbs and roots and of their properties and virtues: they themselves discovered and were the first to use the root which they called peyotl; it was eaten, and those who drank it drank it instead of wine; this they did with the roots they called nandcatl, evil mushrooms which also intoxicate as does wine. And after they had eaten and drunk they foregathered on the plain and danced and sang for joy all through the night and day; this on the first day. The following day they all wept a great deal and they said that the cleaned and washed their faces and eyes with their tears.


In which all the herbs are dealt with. #1. Of certain herbs which produce madness.

There is a herb named coatl xoxouhqui which produces a seed called olloliuhqui; this seed intoxicates and drives men mad. Ill-wishers give it as a drink to those whom they wish to harm, and those who eat it have visions and see dreadful apparitions. Witch doctors give it to their enemies to be eaten with their food and taken with their drink. This herb is medicinal and its seed, when ground and applied, is good for gout.

There is another herb, like a prickly pear, which is called peyotl; it is white and is found in the north. Those who eat or drink it suffer from frightful visions or uncontrollable laughter; the intoxication lasts for two or three days and then disappears. It is similar to a food of the Chichimecas, which nourishes them, gives them strength and courage in battle, takes away thirst and hunger and, they say, protects them from danger.

Another herb is called tlépatl and is like a bunch of hair. It has small heads, without thorns, which resemble lemons; its skin is green, its leaves wide and its flowers white; the seed is black and noisome. It takes away the appetite of those who eat it and causes permanent intoxication and madness. The seed is good for gout when it is applied to the painful spot. Its smell is harmful as well as its seed.

There are other plants called tzitzintlépatl, so-called because of its thorny heads. It has similar properties to the above-mentioned tlépatl.

There is another herb named mixitl; it is small and vine-like, green and with seeds. It is good for gout when ground and placed on the afflicted area. It is not edible or drinkable as it causes vomiting, constricts the throat and tongue, engenders thirst and cracks the tongue; if it is eaten its taste is not unpleasant but its effect is to rob the body of its strength. And if the eyes are open when it is eaten they cannot thereafter be shut, and if they are closed they cannot then be opened. If he who eats it is standing upright he cannot bend down and he loses the power of speech. Wine is an antidote for this herb.

In these lands there are some little mushrooms called teonandcatl which grow under hay-fields; they are round and the stem is slender and circular. They have an unpleasant taste, damage the throat and intoxicate. They are an effective remedy against fevers and gout; not more than two or three should be eaten at a time. Those who eat them see visions and suffer from heartburn. Those who eat many of them become lascivious.

Another poisonous plant is the tochtetepe whose leaves are small like those of the Peruvian tree and whose roots are white. If anyone eats or drinks it he dies because it destroys the intestines; and if the herb is put in pulque or water—even if it is later removed, the poison remains—he who drinks it dies. It is said that witch-doctors cast spells with this herb.

There is another herb called atlepatl which grows by running water and in marshes. It is deadly poison and any creature that eats it or drinks it will die. If it is applied to the skin it causes red-hot blisters. Due to its effectiveness against leprosy it is called xiotl.
There is a herb called *aquiztli* whose branches are long and slender; it resembles a bunch of hair or bushes and it causes the face and body of he who urinates or spits on it to swell; if it touches the skin it brings up blisters. It is good for smallpox, if drunk its juice will bring out the spots.

There is another herb called *tenxoxoli*; its leaves are like those of the red mace; its root causes vomiting and blood vomit.

Another herb is known as *quimichpatli* and is similar to a bush. It is deadly poison and when mixed with their food it kills rats. If it is applied to gangrenous wounds it eats away the rottenness leaving healthy skin.


Once the sacrifice was over, the steps of the temple and courtyard weltered in human blood, and everyone departed in order to partake of raw mushrooms. Having consumed this foodstuff those present lost all sense of judgement, and were in far worse state than if they had tipped wine. So inebriated and devoid of all restraint did they become that quite a number were killed by their own hand, and so great was the power of these mushrooms that many saw visions and had the future revealed to them, for the devil spake with them while they were thus intoxicated... History has it that from that day Montezuma summoned all kings and enemy chieftains for a celebration thrice in every year; the first was the feast of chieftains, the second the feast of flags, and that remaining was the feast at which they partook of the mushrooms, being called the feast of revelations.


The Mexicans said to them, “Look, my brothers, it is already dawn, let us start to collect bark from the dried trees they call *cuauhtlaxipahualli* and *occozactli*, dried leaves from the pines, branches and mountain clover, *ocoxochitl* and mushrooms”, and they walked on and spent the night at the place they call Apanoayan.


*Atlepatli* or igneous medicine.

The *atlepatli* is a species of our buttercup, with small jagged heart-shaped leaves and long peduncles which sprout from hair-like roots; it has green, soft, slender stems and is covered with yellow flowers, similar to the heads of wild asparagus. It is of a caustic nature. Applied, it cures leprosy, scalled heads, ringworm, and rashes; it corrodes superfluous flesh and ulcerates the healthy. It grows in temperate regions such as Mexico and is found by running water at all times of the year.


*Poyomati*. The *poyomati* is also a species of fern, but its leaves are oblong and serrated, green in some parts and reddish in others: the roots are fibrous and tuberous. It is of the same nature as the rest. There is another root of the same name which induces a strange madness and through which the Indians believe that secrets and the future are revealed to them; but we will speak of this in due course.
Esqua is a bush with ramified roots from which sprout stems six cubits long, misshapen, knotted and green in colour, the leaves are hairy like those of nightshade (it may well be of the same species) but more pointed, its fruit is similar to the date and contains a stone. Having fasted all day and purified the house, the Indians eat the fruit to enable them to find things that have been lost or stolen, and to see, even shut up in their house, a picture of the thief. The leaves, ground and applied, cure inflammation. The Michoacanenses call it esqua and the Mexicans toloatzin. It grows in temperate or cold regions such as Pátzcuaro and Mexico and it is naturally a cold, damp plant although the root is fairly sweet.

On the nanácatl or a kind of mushroom.

There are in New Spain so many varieties of mushrooms that it would be too wearisome to describe or depict each one, therefore we will now deal with some of them in detail and leave for another occasion what is pertinent to the doctrine or complements the natural history of the New World. Briefly, then, some mushrooms grown in these lands and called citlalnacame are deadly; there are others, named teihuintli, which do not cause death when ingested but produce temporary insanity manifested by immoderate laughter; they are tawny in colour, acrid and of a strong though not disagreeable smell. There are others which, without producing laughter, engender all sorts of visions such as war and demons. Again, others are large and ugly and are prized by the chiefs who purchase them at great cost and serve them at their feasts and banquets; these are dun-coloured and have a somewhat sharp taste. Lastly, there are the edible iztacnanacame, which are naturally cold, tasteless and odourless. Some are white, some yellow, others red, grey-brown, black, variegated, green; in short, they are of so many colours that no artist, however capable and painstaking he may be, would be able to portray them. Furthermore, they differ not only in colour and properties but also in their shape and size; there are small ones, large ones, medium-sized, oval, round, oblong, wide ones, and many other shapes besides. What could I do with this abundance of fertile Nature? In fact, I chose to paint only four: first, the edible white mushrooms, many of which grow from a single stalk and are found among rocks; these, because of their colour, are called iztacnanacame or white mushroom. Secondly, the red mushroom called tlalpanacame; thirdly, the yellow mushroom known as chimalnacame which are innocuous and are eaten; and, lastly, those which, because they cause intoxication, are called teihuintli. These are dun-coloured and they produce senseless laughter and visions.

Nacáczul.

It is a species of tlápatl found in the province of Huexotzinco. In the early stages its fruit is thornv but later these thorns are shed; it is round and divided, like the melon, in four parts. The seed is tawny in colour and resembles that of the radish; dried, ground and mixed with resin it is excellent for healing broken bones and reducing luxations. To effect this the Indians cover the patient with feathers, put him in splints and take him to the open-air bath called, in their native language, temaxcalli. This treatment is repeated as often as is considered necessary. It grows on rubbish dumps everywhere and in the hedges of Pahuatlan, and is much esteemed by the Indians to ward off curses. In shape it is like the tlápatl, for its leaves resemble those of the vine, strong-smelling, soft, fleshy and downy; its stalk is similar to that of the fig-tree and its roots are white and ramified. Four of its leaves, pounded and taken with water, prove efficacious for body pains, even those caused by gallic sickness; the leaves can also be mixed with yellow chilli. However, care must be taken not to exceed the stated dose as this would produce alienation, visions and delirium. Some people call it toloatzin.
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Its roots are white and ramified, its fruit round and similar to a chestnut bur, its leaves like those of the vine, wide and divided by deep lines, and its flower white, long and capsule-shaped. It is, like the *nayczcul*, naturally cold and lacks a distinctive taste or smell. The leaves, after being cooked, are applied to the body to relieve fevers, particularly quartan; or they can be applied in the form of suppositories or small balls. The fruit and the leaves are effective in the case of chest pains; also, mixed with water and placed in the ears they lessen deafness. A few drops on the pillow brings sleep to those who suffer from insomnia, and taken in large quantities it brings on madness. It is found everywhere but mainly in Tepecuacuilco and Mexico.


The *ololiuhqui*, which some call *coaxihuitl* or herb of the serpent, is a vine-like plant with fibrous roots, cylindrical, narrow green stems and leaves which are also narrow and green but heart-shaped, long white flowers and a round seed which resembles coriander, from which it takes its name. It is hot to the fourth degree. It is a cure for gallic disease, it soothes pains caused by cold, relieves flatulence and dissolves tumours. Made into a powder and mixed with resin it serves as an excellent remedy for fractured and broken bones and for women suffering from dropped womb, which its strengthens. In medicine the seed only is used; this, ground and applied to the head and forehead with milk and chilli, is said to cure eye ailments. Eaten, it acts as an aphrodisiac. The seed is sharp to the taste and, like the plant itself, hot. When the Indian priests wished to simulate a conversation with their gods and receive replies to their questions they partook of the plant which produced delirium and apparitions of phantoms and demons. This property can be said to be similar to Dioscorides’s *Solanum manicatum*. It is found in the open country of the warmer regions.


It is a medium-sized root which produces neither branches nor leaves above ground, but merely a down which is attached to the root. For this reason it was not possible to draw it. It is said that there is a male and a female of the species. It is sweet to the taste and of moderate heat. Ground to a powder it is said to relieve pains of the joints. If we are to believe a theory which is given great credence among the Indians, this plant gives to those who eat it the power of foreseeing and foretelling the future. Whether, for example, enemies were to attack the following day, whether happy times were ahead, who stole a utensil or any other object, and many other things which the Chichimecs try to find out through the medium of this drug. In addition, when they wish to know where to look for the root they eat another one which tells them. It grows in warm humid areas.

Text No. 16. ACOSTA (1590). Book V, chapter 26, 1590 Edn., pp. 370–371. . . the Indians drank the ground seed of the *ololiuhqui* so as to have visions and confound their senses . . . With this mixture they became wizards and through it they saw and spoke to the Devil. When the priests partook of it they lost all fear and acquired a spirit of cruelty.

Text No. 17. CÁRDENAS (1591). Chapter [XV] last, 1591 Edn., ff. 234–246. Last chapter. In which it is declared utterly whether it can be witchcraft in the herbs, and what are witch-crafts.

. . . For us is left only to declare this that it is experienced in the Indies of the Peyot, of the Poyomate, of the Ololisque and even of the Piciete that many affirm, mostly Indians, Negroes, and dull stupid ignorant people, that if these above-mentioned herbs are taken
by mouth they imagine and see the Devil, who talks to them and declares of things to come: it is now convenient to investigate if some herbs or roots exist in nature the virtue of which could be so effective and powerful that by means of them we force the devil to come at our call, or by them we foresee things to come. In reference to this, it occurs to me that the answer is that there is part of this in the herb and there is part that should be attributed to the devil, I declare furthermore, when one of these herbs that I mentioned, or any other that could exist, similar in virtue is taken by mouth or use is made of them, the herb produces, due to its properties and naturally, three things in the human body, and everything else is illusion and the work of the devil. The effects that the herb has are the following: in the first place, inasmuch as these herbs are within themselves extremely hot and strong and at the same time are composed of parts extremely subtle, strong and hot, in entering into the stomach the natural heat starts to alter and heat them, and in heating them makes ascend and distributes in the cerebrum and every part of the body in the form of a vapour the parts more subtle, strong and hot of the herb, distributed all these extremely hot parts in the cerebrum and in every way in pores of the body, they start to heat, perturb and disorganize the animal spirits of the body, taking the man out of his judgements, as is done by wine, the piciete, and to conclude every herb, and even a drink, and any sustaining material strong and vaporous and this is the first effect that the herb or root makes out of its own virtue. The second effect that the said herb has, is to cause annoying and painful dreams in the man who takes it, and this is caused by those same thick and vaporous fumes of the same herb, which although at the beginning may be subtle, in thickening with the coldness and humidity of the cerebrum, and so came to cause sleep, not smooth and easy and pleasant as the one that comes and is caused out of the soft and humid vapours of the sustaining materials, but a sleep horrible and terrifying as is naturally caused by fumes strong and painful. The third effect of the aforementioned herbs, or of their painful fumes, is to disturb and disorganize the species that are in the interior senses of the cerebrum and perturbing them are represented in the imagination, no species and forms of things that are enjoyable, and entertaining the so-mentioned imaginative potency, but instead terrifying and awful things and therefore they imagine species of figures of monsters, bulls, tigers, lions and ghosts, in conclusion painful black fumes, strong and heavy are the ones that cause such a sleep, and the ones that move the species in the fantasy, it is understood that they will not represent in the imaginative species of beautiful things, pretty, colourful and pleasant, but on the contrary, of wild beasts and horrible things, as the figure of the devil should be represented by the figure of a horrible monster; and so that all of these effects of throwing away the judgement of the one who takes it, to cause horrible sleep, and to represent a species of horrible things in the imagination, it can be made out of its own virtue by every herb of the ones above-mentioned, and therefore there is reason and cause to be able to make it. The one thing that the herb or root cannot make without having a pact and communication with the devil, is what I am going to say now, in the first place the devil to come at the call of the wicked man who searches for him, this is something that the herb cannot do, and it is completely false to say that the herb out of its virtue makes the devil appear; the second, to say that due to the virtue of the herb we know of things to come or secrets that have occurred, it is a notable error that the devil says or declares this, that I understand it, as in effect was told and declared in ancient times by the mouths of the oracles, those false gods, but that the herb out of its virtue could make neither one of these things, I have it as falsehood and deceit to some of these wretched ones he must advise them to make use of some of these herbs, not because that with their virtue he must come at their call, but that with them they may get inebriated, and get out of judgement, and getting out may lose the fear of a thing so horrible and ugly as must be the devil, and being like that out of judgement of being half astonished, the devil comes to communicate, deceive him and tell or answer about what he requests, and this is the cause why the Indian priests of this land, in order that they might consult with the devil, used first to take the smoke of the strongest piciete that they were able to find, and so was ordered by the devil, and it was that they faster might get inebriated and lose the fear with the
inebriation; furthermore, when we read or hear said that the sybils and the priests of Apollo, Jupiter and Diana became furious when wanting to give answers of their gods, it must be that they became furious with some strong herb, that the devil ordered them to take, and being furious with it, lose the fear, and the devil came and gave answer; and so everything that I say is true with no more token and certainty of it than to see by experience that the man who uses the above-mentioned herbs with good intent, I mean to say with the purpose of healing some disease, because also these herbs are very medicinal, the most that can happen, what we said above, due to some virtue the herb produces therefore half inebriation with it, and to cause the mentioned herb-sleep, and at the most to represent to him among dreams things annoying and painful; but not that he may really see the devil and know things to come, on the contrary this occurs in the one who uses these herbs with an evil intent, as Indian braves and squaws who are called witches, because such as these take them with the purpose of seeing the devil, and knowing things that they did not know, to such as these God permits that the devil presents himself to them; but as I say this is not by virtue of the herb, because this exceeds its limits. And with this it seems to me to give an end to this annoying chapter and even to all the first part of the Indian Problems, to the honour and the glory of God our Lord, and his very blessed mother our lady. The second part will come to light promptly, with the divine favour. Amen.

Praise the Lord.

Text No. 18. LEÓN. (1611). 1611 Edn., f.112v.

... or have you drunk peyote or did you give it to someone to drink in order to know something or discover a secret or something stolen?


On the herb they call ololiuhqui, which means plant of round leaves. The seed ground and drunk ... provokes lewdness ... in olden times the priests of the idols who wanted to deal with the Devil and to resolve their doubts used to eat this plant so as to become mad and see thousands of phantoms that appeared before them. In this respect the plant is like solano maniac0 of Dioscorides. It would be better not to say, at this point, where it grows because it matters little that we shall not write here of this herb and not even that the Spaniards should know of it.

Text No. 20. INQUISITION (1616). 1616 Edn., f.2r.

We the Inquisitors against heretic perversity and apostasy in the city of Mexico . . . , Also, that many people . . . take certain drinks made of herbs and roots with which they lose and confound their senses, and the illusions and fantastic representations they have, judge and proclaim afterwards as revelation, or true notice of things to come . . . Mexico, 8th May, 1616.


... It should be noted that practically every time they proceed to offer up sacrifices to their imagined gods, everything is ordered and arranged thus by some chieftain, physician, sorcerer or divine from among the Indians, based in the main on the witchcraft which is revealed to them when they are thoroughly inebriated in the drink of what is called Ololiuhqui, or Peyote, or Tobacco, as will be explained later.


Of the heresies, abuses, and observations of so-called divine matters, more particularly regarding Ololiuhqui, Piciete and Peyote.

The above-mentioned substances are worshipped as gods and ololiuhqui is a kind of seed like lentils from a sort of creeper of this country; once this seed has been drunk [a man] loses all sense of judgement, as it is very strong; and by these means they commune with
the devil, for they can speak whilst they are thus out of their senses with the said drink, which deceives them with various apparitions, and they attribute this to the deity which they say is in the seed, called ololiuhqui or cuexpalli which is the same thing.


Of the superstitions concerning Ololiuhqui.

What is called ololiuhqui is a seed like the lentil or vetch, the juice of which deprives man of his judgement, and it is remarkable what faith these unhappy natives have in the seed. It is their oracle and they consult it by drinking it and finding out what they want to know, even those things which human understanding cannot know, such as the cause of illnesses. Those among them who are consumptive, phtisical, who suffer from dysentery and other serious diseases, attribute their ill-health to sorcery and to relieve their minds on this score and with reference to other things such as [the whereabouts of] stolen articles and the identity of their enemies they consult the seed through the medium of one of their charlatan doctors, some of whose function it is to drink the [liquid of the] seed for this purpose; this doctor is called Pávni, because of the office he holds, and he is well paid and also receives food and drink for his work. If such a doctor is not a drinker of the seeds or he wishes to excuse himself from undergoing the torment involved he advises the sick man or someone else to drink [the juice of] the seed, for which service the doctor must be remunerated, because he is the one who indicates the day on which the drink is to be taken, what must be drunk and to what end.

Lastly the doctor or the person who drinks this seed or peyote—another small root in which they have this same belief—shuts himself up in a room, usually his own chamber, where no one may enter during the consultation which lasts as long as the medium is in his trance. They believe that it is in this trance that the ololiuhqui or peyote reveals what it is they wish to know. In this state of intoxication or loss of the senses the medium utters two thousand absurdities, among which the devil inserts some truth, so that they continue to be gulled and taken in by him.


Of the uses of ololiuhqui and the abuses that ensue from superstitious belief in it.

. . . After this follows inebriation caused by the drink and during it the drunkard’s fantasy mixes up the facts which had previously been reported to him as suspicions . . . he announces [his findings] when he emerges from the state of inebriation. This is usually after one or two days, although he may remain in a stupified condition for many days and even become permanently mad . . . Many such cases have passed through my hands and in some of them it has been necessary to use the powers of the Holy Office [Inquisition].


If the consultation is about a lost or stolen article or concerns a woman who has absented herself from her husband, or some such similar thing, here enters the gift of false prophecy and the divination that has been mentioned in the preceding treatises; divination is made in one of two ways, either by means of a trance or by drinking peyote or ololiuhqui or tobacco to attain this end, or commanding that another drink it and ordering him to remain under its spell; and in all this goes implicitly hand in hand the pact with the devil who, by means of these drinks, appears to them and speaks to them, giving them to understand that he who speaks to them is the ololiuhqui or the peyote or whatever beverage they had drunk for the said end; and the sorry part of it is that many put faith in [the drink] as in the very lying cheats themselves, [indeed] even more than in the evangelical predicators.


. . . But sometimes I believed in dreams, in herbs, in the ololiuhqui, and peyote and other things.

. . . Have you believed in dreams, in the Peyote, Ololiuhqui, in the fire . . . or in other superstitions your forefathers had?
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The superstitions they have.
... There is also a widespread belief that the Indian women in this town [Mérida de Yucatán] put certain witchcraft in the chocolate to make their husbands lose their senses...

The root they revere most is the one they call peyot which they grind and drink for every disease; it would not be too bad if they did not abuse its virtues but in order to have knowledge of the future and to know how they will emerge in battle, they drink it dissolved in water and, as it is so strong, it gives them a sort of inebriation combined with a kind of madness, and every fantastic vision induced by this horrid beverage they take as an omen of their designs, imagining that the root has revealed coming events to them. And the worst part of it is that not only the pagans execute this barbaric superstition but even the domesticated Indians persist in the infernal abuse, drinking it behind the backs of the priests, procuring it in complete secrecy.

Nearby was placed a tray filled with peyote, which is a diabolical root that is ground and drunk by them so that they may not become weakened by the exhausting effects of so long a function; this they began by forming as large a circle of men and women as occupied the space that had been swept for this purpose... When the dance had ended all who could hold themselves on their feet stood; the majority, because of the peyote and wine they had drunk, were unable to use their legs to hold themselves upright.

Sacraments of penitence. Questions for the confession of such Indians. Fifth Commandment... Have you eaten human flesh? Have you eaten peyote? Did you get drunk? Have you taken "frixolillo" [little beans]...