

From the book *Plants of the Gods* by [Albert Hofmann](#) and [Richard Evans Schultes](#):

The Nectar of Delight



In Lewis Carroll's *Alice in Wonderland*, the encounter between Alice and the langorous caterpillar is as follows: "She stretched herself up on tiptoe, and peeped over the edge of the mushroom, and her eyes immediately met those of a large blue caterpillar that was sitting on the top, with its arms folded, quietly smoking a long hookah, and taking not the slightest notice of her or anything else."

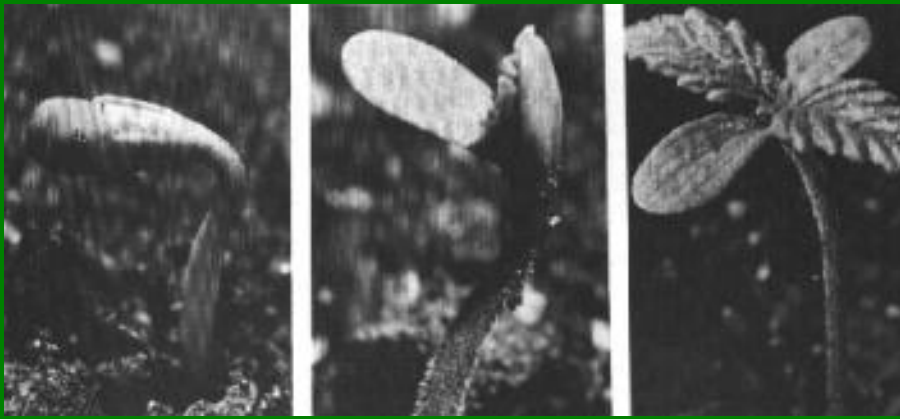
Tradition in India maintains that the gods sent man the Hemp plant so that he might attain delight, courage, and have heightened sexual desires. When nectar or Amrita dropped down from heaven, *Cannabis* sprouted from it. Another story tells how, when the gods, helped by demons, churned the milk ocean to obtain Amrita, one of the resulting nectars was *Cannabis*. It was consecrated to Shiva and was Indra's favorite drink. After the churning of the ocean, demons attempted to gain control of Amrita, but the gods were able to prevent this seizure, giving *Cannabis* the name Vijaya ("victory") to commemorate their success. Ever since, this plant of the gods has been held in India to bestow supernatural powers on its users.

The partnership of *Cannabis* and man has existed now probably for ten thousand years -- since the discovery of agriculture in the Old World. One of our old cultivars, *Cannabis* has been a five-purpose plant: as a source of hempen fibers; for its oil; for its akenes or "seeds," consumed by man for food; for its narcotic properties; and therapeutically to treat a wide spectrum of ills in folk medicine and in modern pharmacopoeias.



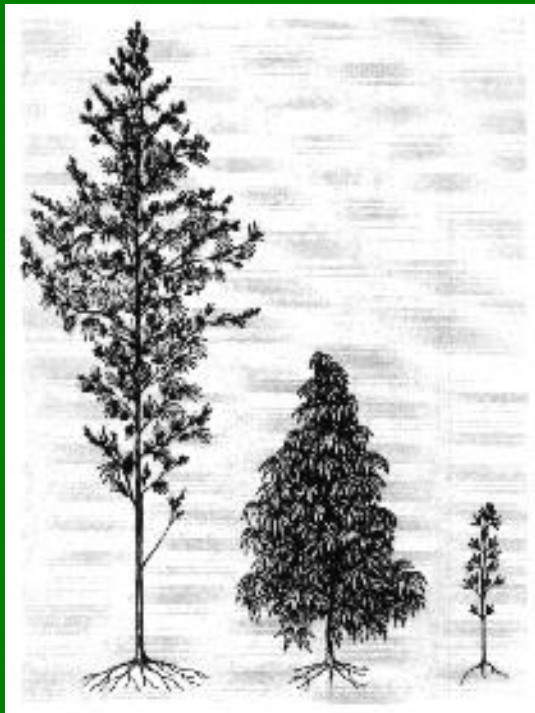
Woodcut of Hemp or *Cannabis sativa* as illustrated in the herbal *Kreuterbuch* of Leonard Fuchs. 1543.

Mainly because of its various uses, *Cannabis* has been taken to many regions around the world. Unusual things happen to plants after long association with man and agriculture. They are grown in new and strange environments and often have opportunities to hybridize that are not offered in their native habitats. They escape from cultivation and frequently become aggressive weeds. They may be changed through human selection for characteristics associated with a specific use. Many cultivated plants are so changed from their ancestral types that it is not possible to unravel their evolutionary history. Such is not the case, however, with *Cannabis*. Yet, despite its long history as a major crop plant, *Cannabis* is still characterized more by what is not known about its biology than what is known.



These three photographs show the germinating Hemp plant. The rounded leaves are cotyledons or seed-leaves. The first real leaves are always simple, not segmented as are the mature leaves.

The botanical classification of *Cannabis* has long been uncertain. Botanists have not agreed on the family to which *Cannabis* belongs: early investigators put it in the Nettle family (Urticaceae); later it was accommodated in the Fig family (Moraceae); the general trend today is to assign it to a special family, Cannabaceae, in which only *Cannabis* and *Humulus*, the genus of Hops, are members. There has even been disagreement as to how many species of *Cannabis* exist: whether the genus comprises one highly variable species or several distinct species. Evidence now strongly indicates that three species can be recognized: *C. indica*, *C. ruderalis*, and *C. sativa*. These species are distinguished by different growth habits, characters of the akenes, and especially by major differences in structure of the wood. Although all species possess cannabinoids, there may possibly be significant chemical differences, but the evidence is not yet available.



The three species of *Cannabis* (left to right: *C. Sativa*, *C. indica*, and *C. ruderalis*) differ in size and growth habit as indicated in this drawing.

We cannot know now which of the several uses of *Cannabis* was earliest. Since plant uses normally proceed from the simpler to the more complex, one might presume that its useful fibers first attracted man's attention. Indeed remains of hempen fibers have been found in the earliest archaeological sites in the cradles of Asiatic civilization: evidence of fiber in China dating from 4000 B.C. and hempen rope and thread from Turkestan from 3000 B.C. Stone beaters for pounding hemp fiber and impressions of hempen cord baked into pottery have been found in ancient sites in Taiwan. Hempen fabrics have been found in Turkish sites of the late eighth century B.C., and there is a questionable specimen of Hemp in an Egyptian tomb dated between three and four thousand years ago.



The original home of *Cannabis* is thought to be central Asia, but it has spread around the globe with the exception of Arctic regions and areas of wet tropical forests. *Cannabis* spread at a very early date to Africa (except for the humid tropics) and was quickly accepted into native pharmacopoeias. The Spaniards took it to Mexico and Peru, the French to Canada, the English to North America. It had been introduced into northern Europe in Viking times. It was probably the Scythians who took it first to China.

The Indian vedas sang of *Cannabis* as one of the divine nectars, able to give man anything from good health and long life to visions of the gods. The Zend-Avesta of 600 B.C. mentions an intoxicating resin, and the Assyrians used *Cannabis* as an incense as early as the ninth century B.C.

Inscriptions from the Chou dynasty in China, dated 700-500 B.C., have a "negative" connotation that accompanies the ancient character for Cannabis, *Ma*, implying its stupefying properties. Since this idea obviously predated writing, the Pen Tsao Ching, written in A.C. 100 but going back to a legendary emperor, Shen-Nung, 2000 B.C., may be taken as evidence that the Chinese knew and probably used the hallucinogenic properties at very early dates. It was said that *Ma-fen* ("Hemp fruit") "if taken to excess, will produce hallucinations [literally, `seeing devils']. If taken over a long term, it makes one communicate with spirits and lightens one's body." A Taoist priest wrote in the fifth century B.C. that *Cannabis* was employed by "necromancers, in combination with Ginseng, to set forward time and reveal future events." In these early periods, use of *Cannabis* as an hallucinogen was undoubtedly associated with Chinese shamanism, but by the time of European contact 1500 years later, shamanism had fallen into decline, and the use of the plant for inebriation seems to have ceased and had been forgotten. Its value in China then was primarily as a fiber

source. There was, however, a continuous record of Hemp cultivation in China from Neolithic times, and it has been suggested that *Cannabis* may have originated in China, not in central Asia.



The Chinese emperor Shen-Nung is said to have discovered the medicinal properties of many plants. His pharmacopoeia, believed to have been first compiled in 2737 B.C. notes that *Cannabis sativa* has both male and female plants.

About 500 B.C. the Greek writer Herodotus described a marvelous bath of the Scythians, aggressive horsemen who swept out of the Transcaucasus eastward and westward. He reported that "they make a booth by fixing in the ground three sticks inclined toward one another, and stretching around them woollen pelts which they arrange so as to fit as close as possible: inside the booth a dish is placed upon the ground into which they put a number of red hot stones and then add some Hemp seed...immediately it smokes and gives out such a vapor as no Grecian vapor bath can exceed; the Scyths, delighted, shout for joy...." Only recently, archaeologists have excavated frozen Scythian tombs in central Asia, dated between 500 and 300 B.C., and have found tripods and pelts, braziers and charcoal with remains of *Cannabis* leaves and fruit. It has generally been accepted that *Cannabis* originated in central Asia and that it was the Scythians who spread it westward to Europe.



The use of *Cannabis* by the Scythians is evidenced by various objects excavated from a chief's burial mound No. 2 at Pazyryk in the western Altai. The pot at the top contained *Cannabis* fruits, and the copper censer below it was used to burn the sacred plant.



Also from the Pazyryk excavation, two extraordinary rugs were unearthed. The felt rug measuring 15 by 21 feet (ca. 5x7 m) had a border frieze with a repeated composition of a horseman approaching the Great Goddess who holds the Tree of Life in one hand and raises her other hand in welcome. The tombs were constructed in 300 B.C.

While the Greeks and Romans may not generally have taken *Cannabis* for inebriation, there are indications that they were aware of the psychoactive effects of the drug. Democritus reported that it was occasionally drunk with wine and myrrh to produce visionary states, and Galen, about A.D. 200, wrote that it was sometimes customary to give Hemp to guests to promote hilarity and enjoyment.

Cannabis arrived in Europe from the north. In classical Greece and Rome, it was not cultivated as a fiber plant. Fiber for ropes and sails, however, was available to the Romans from Gaul as early as the third century B.C. The Roman writer Lucilius mentioned it in 120 B.C. Pliny the Elder outlined the preparation and grades of hempen fibers in the first century A.C., and hempen rope was found in a Roman site in England dated A. D. 140-180. Whether the Vikings used Hemp rope or not is not known, but palynological evidence indicates that Hemp cultivation had a tremendous increment in England from the early Anglo-Saxon period to late Saxon and Norman times -- from 400 to 1100.



Above, *Cannabis sativa* is being harvested for Hemp at the turn of the century. This species attains a height of 18 feet (6 m). An extremely potent Hashish is produced from *Cannabis indica*, a low, pyramidal, densely branched species, as shown below growing wild near Kandahar, Afghanistan.



Henry VIII fostered the cultivation of Hemp in England. The maritime supremacy of England during Elizabethan times greatly increased the demand. Hemp cultivation began in the British colonies in the New World: first in Canada in 1606, then in Virginia in 1611; the Pilgrims took the crop to New England in 1632. In pre-Revolutionary North America, Hemp was employed even for making work clothes. Hemp was introduced quite independently into Spanish colonies in America: Chile, 1545; Peru, 1554.

There is no doubt that hempen fiber production represents an early use of *Cannabis*, but perhaps consumption of its edible akenes as food predated the discovery of the useful fiber. These akenes are very nutritious, and it is difficult to imagine that early man, constantly searching for food, would have missed this opportunity. Archaeological finds of Hemp akenes in Germany, dated with reservation at 500 B.C., indicate the nutritional use of these plant products. From early times to the present, Hemp akenes have been used as food in eastern Europe, and in the United States as a major ingredient of bird food.

The folk-medicinal value of Hemp -- frequently indistinguishable from its hallucinogenic properties -- may even be its earliest role as an economic plant. The earliest record of the medicinal use of the plant is that of the Chinese emperor-herbalist Shen-Nung who, five thousand years ago, recommended *Cannabis* for malaria,

beri-beri, constipation, rheumatic pains, absent-mindedness, and female disorders. Hoa-Glio, another ancient Chinese herbalist, recommended a mixture of Hemp resin and wine as an analgesic during surgery.

It was in ancient India that this "gift of the gods" found excessive use in folk medicine. It was believed to quicken the mind, prolong life, improve judgment, lower fevers, induce sleep, cure dysentery. Because of its psychoactive properties it was more highly valued than medicines with only physical activity. Several systems of Indian medicine esteemed *Cannabis*. The medical work *Sushruta* claimed that it claimed leprosy. The *Bharaprakasha* of about A.D. 1600 described it as antiphlegmatic, digestive, bile affecting, pungent, and astringent, prescribing it to stimulate the appetite, improve digestion, and better the voice. The spectrum of medicinal uses in India covered control of dandruff and relief of headache, mania, insomnia, venereal disease, whooping cough, earaches, and tuberculosis!

The fame of *Cannabis* as a medicine spread with the plant. In parts of Africa, it was valued in treating dysentery, malaria, anthrax, and fevers. Even today the Hotentots and Mfengu claim its efficacy in treating snake bites, and Sotho women induce partial stupefaction by smoking Hemp before childbirth.

Although *Cannabis* seems not to have been employed in medieval Europe as a hallucinogen, it was highly valued in medicine and its therapeutic uses can be traced back to early classical physicians such as Dioscorides and Galen. Medieval herbalists distinguished "manured hempe" (cultivated) from "bastard hempe" (weedy), recommending the latter "against nodes and wennes and other hard tumors," the former for a host of uses from curing cough to jaundice. They cautioned, however, that in excess it might cause sterility, that "it drieth up... the seeds of generation" in men "and the milke of women's breasts." An interesting use in the sixteenth century -- source of the name Angler's Weed in England -- was locally important: "poured into the holes of earthworms [it] will draw them forth and...fisherman and anglers have use this feate to baite their hooks."

The value of *Cannabis* in folk medicine has clearly been closely tied with its euphoric and hallucinogenic properties, knowledge of which may be as old as its use as a source of fiber. Primitive man, trying all sorts of plant materials as food, must have known the ecstatic hallucinatory effects of Hemp, an intoxication introducing him to an other-worldly plant leading to religious beliefs. Thus the plant early was viewed as a special gift of the gods, a sacred medium for communion with the spirit world.

Although *Cannabis* today is the most widely employed of the hallucinogens, its use purely as a narcotic, except in Asia, appears not to be ancient. In classical times its euphoric properties were, however, recognized. In Thebes, Hemp was made into a drink said to have opium-like properties. Galen reported that cakes with Hemp, if eaten to excess, were intoxicating. The use as an inebriant seems to have been spread east and west by barbarian hordes of central Asia, especially the Scythians, who had a profound cultural influence on early Greece and eastern Europe. And knowledge of the intoxicating effects of Hemp goes far back in Indian history, as indicated by the deep mythological and spiritual beliefs about the plant. One preparation, Bhang, was so sacred that it was thought to deter evil, bring luck, and cleanse man of sin. Those treading upon the leaves of this holy plant would suffer harm or disaster, and sacred oaths were sealed over Hemp. The favorite drink of Indra, god of the firmament, was made from *Cannabis*, and the Hindu god Shiva commanded that the word Bhang must be chanted repeatedly during sowing, weeding, and harvesting of the holy plant. Knowledge and use of the intoxicating properties eventually spread to Asia Minor. Hemp was

employed as an incense in Assyria in the first millennium B.C., suggesting its use as an inebriant. While there is no direct mention of Hemp in the Bible, several obscure passages may refer tangentially to the effects of *Cannabis* resin or Hashish.

It is perhaps in the Himalayas of India and the Tibetan plateau that *Cannabis* preparations assumed their greatest hallucinogenic importance in religious contexts. Bhang is a mild preparation: dried leaves or flowering shoots are pounded with spices into a paste and consumed as candy -- known as *maajun* -- or in tea form. Ganja is made from the resin-rich dried pistillate flowering tops of cultivated plants which are pressed into a compacted mass and kept under pressure for several days to induce chemical changes; most Ganja is smoked, often with Tobacco. Charas consists of the resin itself, a brownish mass which is employed generally in smoking mixtures.

The Tibetans considered *Cannabis* sacred. A Mahayana Buddhist tradition maintains that during the six steps of asceticism leading to his enlightenment, Buddha lived on one Hemp seed a day. He is often depicted with "Soma leaves" in his begging bowl and the mysterious god-narcotic Soma has occasionally been identified with Hemp. In Tantric Buddhism of the Himalayas of Tibet, *Cannabis* plays a very significant role in the meditative ritual used to facilitate deep meditation and heighten awareness. Both medicinal and recreational secular use of Hemp is likewise so common now in this region that the plant is taken for granted as an everyday necessity.

Folklore maintains that the use of Hemp was introduced to Persia by an Indian pilgrim during the reign of Khrusu (A.D. 531-579), but it is known that the Assyrians used Hemp as an incense during the first millennium B.C. Although at first prohibited among Islamic peoples, Hashish spread widely west throughout Asia Minor. In 1378, authorities tried to extirpate Hemp from Arabian territory by the imposition of harsh punishments. As early as 1271, the eating of Hemp was so well known that Marco Polo described its consumption in the secret order of Hashishins, who used the narcotic to experience the rewards in store for them in the afterlife. *Cannabis* extended early and widely from Asia Minor into Africa, partly under the pressure of Islamic influence, but the use of Hemp transcends Mohammedan areas. It is widely believed that Hemp was introduced also with slaves from Malaya. Commonly known in Africa as Kif or Dagga, the plant has entered into primitive native cultures in social and religious contexts. The hotentots, Bushmen, and Kaffirs used Hemp for centuries as a medicine and as an intoxicant. In an ancient tribal ceremony in the Zambesi Valley, participants inhaled vapors from a pile of smoldering Hemp; later, reed tubes and pipes were employed, and the plant material was burned on an altar. The Kasai tribes of the Congo have revived an old Riamba cult in which Hemp, replacing ancient fetishes and symbols, was elevated to a god -- a protector against physical and spiritual harm. Treaties are sealed with puffs of smoke from calabash pipes. Hemp-smoking and Hashish-snuffing cults exist in many parts of east Africa, especially near Lake Victoria.

Hemp has spread to many areas of the New World, but with few exceptions the plant has not penetrated significantly into many native American religious beliefs and ceremonies. There are, however, exceptions such as its use under the name Rosa Maria, by the Tepecano Indians of northwest Mexico who occasionally employ Hemp when Peyote is not available. It has recently been learned that Indians in the Mexican states of Veracruz, Hidalgo, and Puebla practice a communal curing ceremony with a plant called Santa Rosa, identified as *Cannabis sativa*, which is considered both a plant and a sacred intercessor with the Virgin. Although the ceremony is based mainly on Christian elements, the plant is worshiped as an earth deity and is thought to be alive and to represent a part of the heart of God. The participants in this cult believe that the

plant can be dangerous and that it can assume the form of a man's soul, make him ill, enrage him, and even cause death. Sixty years ago, when Mexican laborers introduced the smoking of Marihuana to the United States, it spread across the south, and by the early 1920s, its use was established in New Orleans, confined primarily among the poor and minority groups. The continued spread of the custom in the United States and Europe has resulted in a still unresolved controversy.

Cannabis sativa was officially in the United States Pharmacopoeia until 1937, recommended for a wide variety of disorders, especially as a mild sedative. It is no longer an official drug, although research in the medical potential of some of the cannabinolic constituents or their semi-synthetic analogues is at present very active, particularly in relation to the side-effects of cancer therapy.

The psychoactive effects of *Cannabis* preparations vary widely, depending on dosage, the preparation and the type of plant used, the method of administration, personality of the user, and social and cultural background. Perhaps the most frequent characterisitic is a dreamy state. Long forgotten events are often recalled and thoughts occur in unrelated sequences. Perception of time, and occasionally of space, is altered. Visual and auditory hallucinations follow the use of large doses. Euphoria, excitement, inner happiness -- often with hilarity and laughter -- are typical. In some cases, a final mood of depression may be experienced. While behavior is sometimes impulsive, violence or aggression is seldom induced.

In relatively recent years, the use of *Cannabis* as an intoxicant has spread widely in Western society -- especially in the United States and Europe -- and has caused apprehension in law-making and law-enforcing circles and has created social and health problems. There is still little, if any, agreement on the magnitude of these problems or on their solution. Opinion appears to be pulled in two directions: that the use of *Cannabis* is an extreme social, moral, and health danger that must be stamped out, or that it is an innocuous, pleasant pastime that should be legalized. It may be some time before all the truths concerning the use in our times and society of this ancient drug are fully known. Since an understanding of the history and attitudes of peoples who have long used the plant may play a part in furthering our handling of the situation in modern society, it behooves us to consider the role of *Cannabis* in man's past and to learn what lessons it can teach us: whether to maintain wise restraint in our urbanized, industrialized life or to free it for general use. For it appears that *Cannabis* may be with us for a long time.

THE CHEMISTRY OF MARIHUANA

Whereas the psychoactive principles of most hallucinogenic plants are alkaloids, the active constituents of *Cannabis* are non-nitrogenous and occur in a resinous oil. The hallucinogenic properties are due to cannabinoides, of which the most effective is tetrahydrocannabinol, or THC -- chemically: (-)Delta(1)-3,4-transtetrahydrocannabinol. The highest concentration is found in the resin of the unfertilized pistillate inflorescence. Even though less potent, the dried leaves are also employed for their psychoactive effects. Following the elucidation of the chemical structure (see the graphic for the [Sputnik THC page](#), it has recently been possible to synthesize THC.



This miniature is from a fifteenth-century manuscript of Marco Polo's travels depicting the Persian nobleman Al-Hassan ibn-al-Sabbah, who was known as the Old Man of the Mountain, enjoying the artificial paradise of Hashish eaters. His followers, known as *ashishins*, consumed large amounts of *Cannabis* resin to increase their courage as they slaughtered and plundered on behalf of their leader. The words *assassin* and *hashish* were derived from the name of this band.



The use of *Cannabis* by peoples of both the Old World and New is widespread. In the Old World (left to right) *Cannabis* is being smoked by a Kung woman from South Africa, a pygmy from the Congo, a traveler in Kashmir, and North African Hashish smokers.

The Cuna Indians of Panama use *Cannabis* as a sacred herb. This mola of applique work depicts a Cuna council meeting. An orator is shown addressing two headmen, who lounge in their hammocks and listen judiciously; one smokes a pipe as he swings. Spectators wander in and out, and one man is seen napping on a bench.

The Cora Indians of the Sierra Madre Occidental of Mexico smoke *Cannabis* in the course of their sacred ceremonies. Rarely is an introduced foreign plant adopted and use in indigenous religious ceremonies, but it seems that the Cora of Mexico and the Cuna of Panama have taken up the ritual smoking of *Cannabis*, notwithstanding the fact that, in both areas, it was brought in by the early Europeans.



"Hey, what is this stuff? It makes everything I think seem profound."

In the nineteenth century, a select group of European artists and writers turned to psychoactive agents in an attempt to achieve what has come to be regarded as "mind-expansion" or "mind-alteration." Many people, such as the French poet [Baudelaire](#), believed that creative ability could be greatly enhanced by the use of *Cannabis*. In fact, [Baudelaire](#) wrote vivid descriptions of his personal experiences under the influence of *Cannabis*. At the upper left is Gustave Dore's painting *Composition on the Death of Gerard de Nerval*, inspired probably by the use of *Cannabis* and Opium. Above is a contemporary American cartoon humorously epitomizing the recurrence of this belief. It was not only among the French *literati* that psychoactive substances raised expectations. In 1845, the French psychiatrist [Moreau de Tours](#) published his investigation of Hashish in a fundamental scientific monograph *Du hachisch et de l'alienation mentale*. [Moreau de Tours](#)'s scientific study was on the effects of *Cannabis*. He explored the use of this hallucinogen in Egypt and the Near East and experimented personally with it and other psychoactive plant substances. He concluded that the effects resemble certain mental disorders and suggested that they might be used to induce model psychoses.



"This marvelous experience often occurs as if it were the effect of a superior and invisible power acting on the person from without.... This delightful and singular state...gives no advance warning. It is as unexpected as a ghost, an intermittent haunting from which we must draw, if we are wise, the certainty of a better existence. This acuteness of thought, this enthusiasm of the senses and the spirit must have appeared to man through the ages as the first blessing."

Les Paradis Artificiels

[Charles Baudelaire](#)