In ancient Greece near Eleusis, about 20 kilometers north-west from Athens, a special event was celebrated every September. According to the tradition the goddess Demeter was said to have been reunited here with her daughter Kore, who was also known as Persephone, after she had been kidnapped by the god of the underworld Pluto.

The festival of the mysteries took place twice a year, in spring and in autumn, but the former was not so great and important as the latter. The mysteries, whose origins date to the prehellenic era, became particularly popular when Eleusis came under sovereignty of Athens. In the 5th century B.C. telesterion - the great hall of mysteries was built there. In this building the most important part of the ritual is supposed to have occurred: the ingestion of the kykeon, the mysterious sacrament that caused in participants intensive psychic changes, which cleared their souls, and made them accept death not so much as harm as a blessing, as one of the ancient diarists reported. In the late Roman period the mysteries no longer took place every year, and the cult was finally destroyed in 395 A.D. or the year after it when the troops of Alaric demolished the temple at Eleusis.

The organization of the September’s ritual, which lasted nine days, was supervised by two families who passed the performance of their duties from generation to generation. They were forbidden to reveal the essence of the mysteries, the slightest revelation was threatened by death penalty. The secret of the mysteries had been extremely well guarded, so that with the rise of Christianity the sure knowledge about the essence of the mysteries and especially of the nature of the Eleusinian sacrament has been lost forever.

Anyone who spoke Greek could be initiated, even slaves and women (Goldhill, 1993), which leads to the conclusion that the ingestion of the kykeon must not have had a detrimental effect on possible pregnancies. Initiates were promised a special life in the underworld after death, and during the Roman era the festival became a cosmopolitan event. Great processions went from Athens to Eleusis with songs and other ritual celebrations on the only road built in ancient Greece before the arrival of the Romans. The dramatic enactment of the myth of Demeter and Kore was the most famous and widely celebrated cult in the ancient Greek world.

The central mystery of the Eleusinian mysteries pertains to the nature of the kykeon - the mixture drunk by initiates at the autumnal Eleusinian festival. It was no doubts of palpable nature, so that something was drunk in telesterion in reality and not only in effigy as some historians supposed. This is well supported by the infamous scandalous event that took place in 415 B.C. when the powerful political and military leader of Athens Alkibiades stole the kykeon at Eleusis and entertained by it himself and his friends. Another conclusion can be inferred from this incident: the ingestion of the kykeon must have been a pleasant and therefore sought-after experience. This was confirmed by many writers of antiquity who participated at the mysteries, and to my knowledge there are no reports on bad trips in the ancient texts that have been preserved.

On the contrary, many wrote about the joyful, revealing, truly psychedelic or entheogenic experience (ta hiera - the holy was the only term that initiatives were supposed to say when describing their mysterious experience).

The ingredients of the kykeon were revealed in the seventh century B.C. in the so called Homeric Hymn to Demeter (it was written by an anonymous poet and not by Homer) as follows; water, barley and blechon or glechon - a fragrant Mediterranean mint, probably Mentha pulegium or Mentha aquatica (Rätsch, 1992). This is the only known reference to the composition of the kykeon and it seems somehow incompatible with the secret tightly guarded by the two hierophantic families who were in charge of making it and dispensing at Eleusis. After all, if the recipe for the kykeon had been as simple as that mentioned in the Homeric Hymn, many in ancient Greece would have been mixing their own kykeon, which was, of course, not the case..

As to who first surmised that the kykeon had had psychedelic activity, I have come across three references. According to different sources it was in 1956 or 1962 or 1964 that the hypothesis was proposed that the kykeon might have contained a psychedelic substance. Albert Hofmann (1983) cites Karl Kerényi’s work (1962) as the first having made the statement that the kykeon was a mixture containing a hallucinogenic drug. Jonathan Ott in Pharmacotheon (1993) says that this idea was first suggested by R. Gordon Wasson in 1956, while Terence McKenna in Food of the Gods (1992) gives this credit to Robert Graves in 1964. Be that as it may, both, Wasson and Graves believed that the intoxicating beverage most probably contained mushrooms. Wasson thought that the secret of the mysteries would be found in indoles, while Graves gave more credence to the fly agaric hypothesis, although he conceded that also a psilocybian mushroom (Panaeolus papilionaceus) may have been added to the kykeon. (A collection of Graves’ work, published in London in 1992, sets the origin of this text in 1960.) What catches one’s attention is that mushrooms are quite unlike any of the ingredients of the kykeon, according to the Homeric Hymn.

Let us for a while digress to a similar mystery to that of Eleusis: the nature of the famous Vedic medicine soma and its Iranian variety haoma. In Rig Veda and Atharva Veda there are many references to the appearance as well as the action of soma, and based on them numerous hypotheses were proposed about its botanical identity. Researchers suggested that soma was fly agaric, Syrian rue, ephedra, mandrake or other tropane derivatives containing plants, hemp, psilocybian mushrooms (e.g. Stropharia cubensis) and a couple of other plants, each differing from one another more than perceptibly in its shape and the psychoactive effects it induces.
Today the mystery of soma lies unresolved as so many of the passages in the Vedas that refer to soma are too vague and much more unreliable in their meaning than presumed by Wasson and other scholars who attempted its solving. Is there any possibility that this is the case also for the Eleusinian mysteries, that the reference in the Homeric Hymn of the kykeon is not only unreliable but even deceptive in order to hide the true nature of the sacred libation? For this and other reasons that will be mentioned, some researchers, in recent years most notably T. McKenna, believe that the mystery of the Eleusinian mysteries has not been satisfactorily solved.

Researchers who attempted to solve the Eleusinian mystery according to the Hymn to Demeter directed their attention to barley since few if any mints are psychoactive. Barley has been known to have been infested like other grains by rust - ergot fungus (Claviceps purpurea and Claviceps paspali) since ancient times. Many written testimonies exist about that. Ergot does have established psychedelic effects, it is after all the source of lysergic acid, the precursor of many psychedelic substances, among them LSD. It seemed only natural that the parasitic fungus growing on barley rendered to the Eleusinian sacrament its psychedelic power. The theory that the kykeon derived its psychoactive effects from ergot was proposed at the Second International Conference on Hallucinogenic Mushrooms near Port Townsend, WA on October 28, 1977, by R. Gordon Wasson, Albert Hofmann and Carl A. P. Ruck. Next year appeared the famous book The Road to Eleusis: Unveiling the Secret of the Mysteries by the same authors. In it, at first, Wasson gives an account of his experience with Mexican psilocybin mushrooms and explains why he thinks that the drinking of the Eleusinian potion involved a similar experience.

The second part, written by A. Hofmann, offers an explanation of how in ancient Greece a psychedelic potion could have been prepared from the ergot fungus. Hofmann explains that ergoline alkaloids more or less fall into two categories: non-water soluble peptide alkaloids, which exert more toxic effects, and water soluble lysergic acid derivatives with psychedelic effects more pronounced. Of the latter that appear in nature the most important are ergine (D-lysergic acid amide), the psychoactive principle of many species of Convolvulaceae, and ergonovine (D-lysergic acid-L-2-propanolamide).

Hofmann reports that he ingested 2.0 mg of ergonovine maleate, which is about six times the normal dose used in medicine for ceasing postpartum haemorrhaging. He experienced some psychedelic activity that lasted more than five hours, although Wasson and Ruck, who later also took ergonovine maleate at the same dose, did not experience any distinct psychedelic effects. Hofmann stated that the ancient Greeks, or at least some of them, could have made a safe psychedelic beverage with an aqueous infusion of ergot thereby separating the water soluble alkaloids from more dangerous peptide ones.

But when Gordon Wasson asked Hofmann the question: "Whether early man in Greece could have hit on a method to isolate a hallucinogen from ergot...", his answer to this challenging question considered two possibilities: one was the abovementioned aqueous extract from ergot of barley with ergonovine as a possible psychoactive agent, and the other was what one could call the Paspalum-ergot hypothesis. Claviceps paspali, which only very seldom infests barley, is often found on the Mediterranean wild grass Paspalum distichum, which must surely have grown also near Eleusis.

Albert Hofmann writes in his contribution to The Road to Eleusis that this finding may prove to be of the utmost importance in considering Wasson’s question: the main alkaloids isolated from ergot of Paspalum are the same as those found in the ancient Mexican sacred drug ololiuqui, i.e. ergine and lysergic acid hydroxyethylamide. In his opinion the Paspalum-ergot hypothesis is much more probable than the barley-ergot hypothesis, as it is well established that these alkaloids have psychedelic activity. In the psychedelic usage of seeds of Convolvulaceae he sees the convincing proof that the Paspalum-ergot hypothesis is tenable (Hofmann, 1993; 1994).

In the third part C.A.P. Ruck with the assistance of Danny Staples renders detailed explanation of the Hymn to Demeter and cites the information from related Greek texts that pertain to Demeter’s Eleusinian cult. In this and two following writings Ruck (Ruck, 1981; 1983) expounds some historical evidence that ergot was the key ingredient in Demeter’s potion, from the fact that Demeter was often called Erysibe or Erysiphe (darnel and probably ergot in Greek) to the purple colour of her robes, which was supposed to reflect the dark purplish-brown hue of Claviceps.

It would seem that the kykeon containing ergot of Paspalum is not the kykeon according to the Homeric Hymn any more. But in Hofmann’s opinion barley was not believed to be the psychedelic principle, but a nutrient extract and mint as a stomachicum. The admixture of mint fits well into the ergot hypothesis of the kykeon, because it is well known that ergot preparations produce light nausea which can be counteracted by mint (Hofmann, 1994). There is no doubt that principle ergoline alkaloids of C. paspali produce a genuine psychedelic reaction.

The Wasson/Hofmann/Ruck theory, albeit bold, seems to be well argued. But, as the burden of proof is on those who assert, we must ask along with T. McKenna if it has been subjected to the acid test (McKenna, 1992): that means actually brewing the superior psychedelically working kykeon from ergot infested plants. After Hofmann’s and his co-authors’ self-experiments, there seem to be only three more published accounts of similar trials. All were with pure substances: ergonovine maleate (Bigwood & al., 1979) and methylergonovine (Ott & Neely, 1980), but none were with an aqueous solution of ergot. In a recent letter Jonathan Ott (1994) informed me that to his knowledge no one has yet shown by psychonautic assay that the Wasson/Hofmann/Ruck kykeon (a filtered aqueous
The results with the mentioned ingestion of ergovine and methylergonovine, respectively, were not exactly impressive and, in other words, not at all confirmative of the ergot of barley hypothesis considering they were purported to assess it. Jeremy Bigwood, Jonathan Ott, Catherine Thompson and Patricia Neely in August 1978 repeated Hofmann’s experiment with higher doses: from 3.0 to 10.0 mg of ergovine maleate (Bigwood & al., 1979). The intoxication at 3.0 mg produced very mild visual alterations, lassitude and mild leg cramps. The effects tapered off in seven hours. At 5.0 mg, lassitude and cramps were more pronounced. The psychic effects were also more intense, particularly eidetic phenomena, but they were still mild, while the somatic effects were quite strong. Only at 10.0 mg were visual effects comparable to a threshold dose of LSD or psilocybin, but the physical effects (cramping) were already painful and debilitating. The experimenters were also in a kind of dreamy state, as the natural psychoactive ergoline alkaloids, apart from LSD, show a pronounced narcotic component.

The researchers concluded that, although psychedelic effects of ergovine were similar to those of a minimal dose of LSD, its somatic effects so much overshadowed the psychic ones that they had no wish to ingest it at psychedelic doses any more. Two years later J. Ott and P. Neely (Ott & Neely, 1980) attempted a similar experiment with methylergonovine (D-lysergic acid-(+)-2-butanolamide) at 2.0 mg each. Somatic effects included vertigo, salivation, mild cramping, yawning, and psychic effects mostly excited imagination and visualization from auditory cues. The trip was reminiscent of LSD but much milder and more superficial. As with ergovine, a semi-narcotic state was experienced during it. Uncomfortable somatic effects, again this time, were overshadowing bland psychic changes, which were a far cry from what the Homeric Hymn tells about the initiation experience at Eleusis: “Blissful is he among men on Earth who has beheld that,” or what Pindar and Cicero and others reported.

The latest published experiment with the ingestion of an ergoline alkaloid is by Michael Ripinsky-Naxon, who in his book The Nature of Shamanism (1993) mentions that he and his co-workers ingested 6.0 mg of ergovine without giving many details about the setting. They had unimpressive psychic changes, mostly low perceptual alterations, accompanied with leg cramps.

As I have already mentioned, there are no reports on experiments with water soaked ergot rust, which is completely understandable keeping in mind the historical evidence about the ingestion of ergot infested grain. Ergotism killed thousands of people, and very unpleasant experiences can be logically expected by those who set out to prove the ergot of barley hypothesis. Reservations about this part of Wasson/Hofmann/Ruck theory are best summarized by T. McKenna (1992): how could an ergotized beverage have been taken for so many centuries without unpleasant side effects, becoming a part of the legend? As it was clearly shown, even water soluble alkaloids exert painful somatic effects. How come that no ancient writer who wrote about the Eleusinian initiation mentioned the similarities between it and ergot poisoning? They were all deeply impressed by the experience in a positive way, and reports exist only on truly psychedelic and even transcendental experiences. There are no reports on bad trips accompanied with somatic tormentation and pain that always result from ergot ingestion.

Despite the fact that certain ergoline alkaloid containing fungi are used in psychedelic preparations in some parts of the world (Ott, 1993), it is clear that they are used only as additives to another component that has the central psychedelic role in a preparation, and that they tend to produce much more deliriant than entheogenic experience, especially when used alone.

Is there any possibility that the kykeon might have contained other ingredients besides those mentioned in the Hymn to Demeter that alleviated the unpleasant effects of ergoline alkaloids? Some researchers (Rätsch, 1992; Ripinsky-Naxon, 1993) suppose that opium was an additive to the kykeon. Demeter as well as Persephone were associated with poppy and many iconographic motifs of the two goddesses with poppy pods have been found. It is well known that more or less all depressants (e.g. neuroleptics, barbiturates, benzodiazepines) suppress an LSD induced psychedelic reaction, and among some LSD consumers the easiest way to abort the trip is by smoking some heroin.

I asked some researchers about the possible interaction of ergoline and opium alkaloids. J. Ott (1994) is sceptical of presumed anti-LSD activity of heroin and other opiates, whereas A. Hofmann (1994) and Alexander Shulgin (1994) believe that opiates must have, like other downers, a diminishing effect on a lysergic acid derivative induced trip. Since no controlled human studies seem to exist about that interaction, there is only some animal work to refer to (experiments cited by Sankar, 1975). It showed a clear antagonism between LSD and morphine in mice, rabbits and dogs, but Shulgin says that he would look at Sankar’s review with some care. As we know that the psychedelic reaction is almost impossible to observe in experimental animals, the definitive solution of this problem cannot be expected until human trials are conducted in accordance with relevant statistical criteria. Yet, I think, it is plausible to conjecture that a possible opium addition to an ergotized preparation could only diminish its psychedelic strength and not enhance it.

And so, is there a reasonable probability that ergot of barley or some of its alkaloids played the central psychedelic role in the kykeon? In the opinion of some researchers (e.g. Rätsch, 1995), including me, it is not very likely. Only by the ingestion of the kykeon, mixed according to the first part of the Wasson/Hofmann/Ruck theory in a sufficient dose to produce a genuine psychedelic experience without some dire consequences, can this hypothesis be irrevocably proved or disproved. It is unfortunate for research but, I believe, by all means fortunate for researchers, that no one has attempted to do so. In one of his letters, Jonathan Ott (1994) informed me that he intended to test the ergot (of barley) hypothesis one day soon. I think that we all should eagerly, but of course not too eagerly, expect the results of his ergot-self-experimentation.
I am indebted to Albert Hofmann, Jonathan Ott, Christian Rätsch and Alexander Shulgin for their help and critical comments.

The Paspalum-ergot hypothesis is much less publicized and sometimes even omitted in many a work that deals with the Eleusinian mysteries as well as in letters I have exchanged with some of their authors recently. In practically all writings after The Road to Eleusis about this topic I have come across the emphasis on and sometimes even the preoccupation with ergot of barley (C. purpureum) as the central ingredient of the kykeon and ergonovine as its most important psychedelic alkaloid (cf. just the most recent work: Rätsch, 1992; Ott, 1993; Ripinsky-Naxon, 1993). This is no doubts the consequence of literally sticking to the words of the Hymn to Demeter, which I firmly believe do not contain the truth, or at least not the whole truth about the composition of the kykeon.

As to the Paspalum-ergot hypothesis, I must say at first that I have not come across any reference about the ingestion of C. paspali by man, either accidentally or on purpose. It is only known that a neurological disorder, Dalligrass poisoning, also called "paspalum staggers", occurs when cattle graze Paspalum dilatatum infected with the fungus Claviceps paspali (Cole & al., 1977; Springer & Clardy, 1980; Gallagher, Leutwiler & al., 1980). Clinical signs of paspalum staggers are tremors, which are exaggerated by enforced movement, hyperexcitability and ataxia. Mortalities from the disease are generally caused by accident or inability of affected animals to obtain water. Affected animals generally recover from the disease if removed from the toxic pasture.

At least five tremorgenic substances were isolated from Claviceps paspali, three of them were named as paspine, paspalicine and paspalinine.

With the Paspalum-ergot hypothesis there are two possibilities:

1) The paspali metabolites, which are soluble in most of organic solvents (Cole & al., 1977), are not water soluble, or at least not in a sufficient grade to have been extracted in the kykeon. If these alkaloids accumulate mostly intracellularly in oleosomes as do ergopeptides in Claviceps purpurea, then it is reasonable to conclude that they were not in the kykeon in toxic quantities.

2) If the paspali metabolites are water soluble and accumulate mostly extracellularly like simple lysergic acid derivatives and clavines, it would mean that the kykeon must have been tremorgenic at least. There is, of course, some possibility that the paspali alkaloids produce toxic symptoms only in cattle and mice, but this is in may opinion extremely low possibility. Werner Acklin of ETH in Zurich informed me recently (1995) that alkaloids of Claviceps paspali are, for an organic chemist's practical purposes, insoluble in water.

I would not consider the conclusion made by Hofmann by analogy with Mexican preparations of seeds of Convolvulaceae as a convincing proof, which, I think, can come only through the ingestion of the ergot of Paspalum infusion. Until either barley-ergot or Paspalum-ergot part of the Wasson/Hofmann/Ruck theory, or for that matter any theory or hypothesis that tries to explain a phenomenon and can be experimentally proved, is rendered proven in this way, it is equally legitimate, though not equally plausible, to hold any explanation as convincing (Casti, 1990). To my knowledge there has been not a single attempt to ingest water soaked ergot with other putative ingredients that would simulate the kykeon in a controlled environment. What one can found aplenty in some writings are explanations of ways, more or less very complicated, how ergot could be ingested safely. It is this discrepancy between theoretical discourse and the lack of experimental evidence that my criticism is aimed at in the first place. No wonder then that due to the lack of hard data some recent work on the Eleusinian mysteries denies any psychoactivity of the kykeon (Foley, 1994), or does not mention the kykeon at all (Goldhill, 1993).

In both hypotheses of the Wasson/Hofmann/Ruck Eleusinian theory we have a verifiable scientific hypothesis, but which seems that it cannot be verified at no costs and dangers for experimental human subjects. It would be difficult to comply with all moral as well as methodological requirements that are required by a scientific experiment with human subjects (cf. Sheridan, 1976; Craig & Metze, 1979; Shulgin & Shulgin, 1993), which means among other things that one self-experiment (although better than none) cannot have the methodological requirements that are required by a scientific experiment with human subjects (cf. Sheridan, 1976; Craig & Metze, 1979; Shulgin & Shulgin, 1993), which means among other things that one self-experiment (although better than none) cannot have any explanation as convincing (Casti, 1990). To my knowledge there has been not a single attempt to ingest water soaked ergot with other putative ingredients that would simulate the kykeon in a controlled environment. What one can found aplenty in some writings are explanations of ways, more or less very complicated, how ergot could be ingested safely. It is this discrepancy between theoretical discourse and the lack of experimental evidence that my criticism is aimed at in the first place. No wonder then that due to the lack of hard data some recent work on the Eleusinian mysteries denies any psychoactivity of the kykeon (Foley, 1994), or does not mention the kykeon at all (Goldhill, 1993).

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But if the future research shows that ergot could hardly be the mystical ingredient of the Eleusinian mysterious mixture, some other psychoactive plants must be supposed to substitute it. Although some researchers believe that only ergot could have provided enough material to make the kykeon in sufficient quantities to be shared among about 2,000 initiates that are believed to have convened at Eleusis in an average autumn (Camilla, 1996), they also expressed the belief that psychedelic mushrooms played more than a marginal role in ancient Greek culture (Samorini & Camilla, 1995). I agree with Robert Graves and Terence McKenna that there exists also reasonable possibility that psilocybian mushrooms might have helped to produce the astonishment and ecstasy in ancient initiates, who ascribed to the Eleusinian mysteries a veritable transcendental quality. Of course, there may exist other interactions among psychoactive plants that we are not aware of today, but the information about them was no secret to a priest clan in ancient Greece. Will we know one day once and for all what was the essence of the sacred drink at Eleusis? Maybe, if there is a sealed vessel, buried deep under the ruins of telesterion near today’s Elefsina, waiting still to be unearthed.
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