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Mixing the *Kykeon*

Abstract

Hypotheses advanced in *The Road to Eleusis*¹ concerning the possible composition and method of preparation of the *kykeon* are evaluated in light of published criticism. Objections to the *Eleusis* theory are countered, and based on a largely overlooked aspect of the chemical hydrolysis of ergot alkaloids, a new hypothesis is suggested that reinvigorates the *Eleusis* debate. In part 2 of this essay, organic chemist Daniel M. Perrine provides further considerations that build upon the new idea, and a technical discussion of the practicality and realisability of the “Ergine Hypothesis” paves the way for new chemical and psychopharmacological research. In part 3, co-author of *The Road to Eleusis* Carl A. P. Ruck re-examines the Eleusis mythologies and ritual practises from which appear a much expanded understanding of the entheo-pharmacology of the ancient world.

Part 1

by Peter Webster (vignes@monaco.mc)

Introduction

In *The Road to Eleusis*, R. Gordon Wasson, Albert Hofmann and Carl A. P. Ruck attempted to resolve a long-standing debate concerning the famous Eleusinian Mysteries of ancient Greece. Earlier suggestions attributed variously to Karl Kerényi, R. G. Wasson, or Robert Graves had proposed that the autumnal phase of the rite might have involved the use of a psychoactive drug, and it was the task of *The Road to Eleusis* to propose a testable theory as to the nature of the *kykeon*, the revered sacramental potion that would have been a likely vehicle for such a substance.

The principal hypothesis proposed by the three authors suggests that the ergot species *Claviceps purpurea*, collected by the hierophantic priests from its natural and common parasitisation of barley growing in the Rarian plain adjacent to Eleusis, was the probable source of psychoactive ingredient for the elixir. *C. purpurea* and related parasitic fungi produce lysergic acid alkaloids, among which are several known psychedelic compounds as well as other important pharmaceuticals.

The partaking of the *kykeon* marked the climax of the famous autumnal ceremony at Eleusis, performed for nearly two thousand consecutive years and whose initiates included essentially all the great names of Greek antiquity. Claims for the potency and revelatory effect of the *kykeon* and the profound nature of the secrets revealed at the Eleusinian celebration are widespread in Greek literature and historical writings, so there can be little doubt that the rite

was of major importance to the course of Greek civilisation or that the potion must have been more than a symbolic sacrament like the Christian Eucharist of bread and wine: the *kykeon* surely contained a powerful psychoactive substance similar to one of the major vision-inducing and psychedelic plant alkaloids that Western science has only recently re-discovered.

Albert Hofmann, writing in *The Road to Eleusis*, further suggested that the hierophants might have processed the *C. purpurea* ergot with a simple water extraction, dissolving off the water-soluble alkaloids containing ergonovine and methylergonovine, the principal hypothesised psychoactive compounds. Ergonovine, also known as ergometrine or ergobasine, is a psychoactive lysergic acid amide similar in structure to, but far less potent than lysergide, or LSD. The proposed water-extraction process would also supposedly have prevented the toxic ergopeptine alkaloids of *C. purpurea*, abortifacient and dangerously vasoconstrictive but not at all psychedelic, from entering the potion. Ergopeptine alkaloids such as ergotamine and ergotamine were the agents responsible for the recurring plagues of ergotism known throughout European history, so it may safely be assumed that they were somehow excluded from the *kykeon*.

Hofmann also proposed an alternate hypothesis that the *kykeon* might have been prepared from another species of ergot (*Claviceps paspali*), growing not on barley (or only rarely) but on wild grasses of the region such as *Paspalum distichum*. The hypothesis appeared attractive because *C. paspali* produces a much more psychedelic blend of alkaloids than *C. purpurea*, similar to that contained in the redoubtable Western hemisphere psychedelic plant of the Aztecs, *ololiuhqui*. In addition, the toxic ergopeptine alkaloids are largely if not completely absent in this ergot species.

This paper examines these hypotheses in light of more recently published material, and introduces additional considerations in an attempt to take the Eleusis debate to a level from which further research might lead to a breakthrough. New hypotheses concerning the composition of the *kykeon* and the ways it might have been prepared are advanced. We will attempt to evaluate what is known and suspected about the possible composition of the *kykeon* employing several important clues gleaned from Greek literature and modern research. Such clues need to be kept in mind during the evaluation of *kykeon* hypotheses, for considered apart from these clues, even the proposal that an ergot was the psychoactive ingredient can be doubted, and the way left open for the suggestion of several other possible psychoactive plants as the key ingredient. Indeed, certain authors have done so, in a paper to be discussed below.

The Clues

The fact that the Rite was practised like clockwork for large numbers of communicants (a thousand or more, in later years), and for nearly two millennia must require that the psychedelic entity employed was of constant characteristics and dependability, that sufficient quantities could be easily obtained every year independent of varying conditions, and that the method of preparation was also little subject to the vagaries of error or changing conditions.

Other facts relevant to the *kykeon* and the Rite, and the two hierophant families which controlled and kept secret the recipe for the sacrament for nearly two millennia, are several. Of special importance is the fact that the recipe *was* successfully kept secret for this very long period, when documentation shows that many would probably have desired to discover its particulars. The *kykeon*, or perhaps the secret of its preparation, was apparently stolen on at least one occasion for use at Athens “cocktail parties,” profaning the sacred rite and its potion. If the *kykeon* could have been simply duplicated, if it were obvious which ingredients were

used and how they were prepared, it would presumably have not been necessary to steal it, and its profane use might well have become common. We must assume not only that the recipe was effectively kept secret, but more importantly that some critical feature of the recipe was *easy to keep secret*. Perhaps the true identity of the active ingredient, but more likely the way in which it was processed or prepared was the key secret. Such processes must of course have been simple and reproducible, in line with technical abilities of the time, yet not easily observed by spies nor intuited by outsiders.

Further clues can be gleaned from Greek literature, and pertaining to the characteristics of ergot and the way and frequency with which it infests its hosts, and similar botanical characteristics of other proposed active ingredients such as *Psilocybe* mushrooms. I shall introduce these further clues as necessary during the discussion to follow.

The Objections

Recently, objections have been raised concerning the ergot hypothesis, most notably in an article by Ivan Valencic in *Jahrbuch für Ethomedizin und Bewusstseinsforschung*: “Has the Mystery of the Eleusinian Mysteries Been Solved?”. The main complaints of the author are as follows, in the order in which they appear in the article:

Objection 1. The proposed psychoactive ingredients of *C. purpurea*, ergonovine and methylergonovine, are not exceptionally psychedelic when ingested as synthesised compounds.

Objection 2. Preparations of *C. purpurea* itself have not been made and pharmacologically tested which demonstrate it might have been sufficiently psychoactive to have provided the undoubted powerful psychedelic reaction to the *kykeon*.

Objection 3. These same proposed active ingredients, at the doses necessary to produce the moderate psychoactive effects they are capable of producing, also produce significant discomfort, cramping, and lassitude. Presumably the effect of the *kykeon* was a quite enjoyable experience or it wouldn't have been sought after by rich Athenians to entertain guests, nor would the experience of the sacrament at Eleusis have been written about so glowingly by everyone who partook of the Rite and its potion.

Objection 4. In addition, ergonovine at these dose levels is capable of producing spontaneous abortion, and since women were often initiates in the Rite and no such problems were ever described, we must doubt that the full story has been discovered in the *C. purpurea* hypothesis as advanced in *The Road to Eleusis*.

Objection 5. Concerning the *C. paspali* variant of the hypothesis, it is objected that this fungus is known to produce tremors in cattle grazing on infected grass, and, similarly to *C. purpurea*, that no one has processed the fungus into a preparation shown to be psychedelic to a degree in agreement with the properties of the *kykeon*.

Objection 6. The reference to the composition of the *kykeon* in the Homeric *Hymn to Demeter* is obviously incomplete, or even false, the recipe given there containing only water, barley, and a type of mint known to be at most only slightly psychoactive. It is thus proposed that this formula was merely a red

herring, a way to deceive and disguise the true recipe. Barley may have had nothing to do with the true ingredients. Thus other psychedelic entities such as *Psilocybe* mushrooms or even opium must be considered as possibilities.

These would appear to be important reservations. And as the author points out, both the *C. purpurea* and *C. paspali* hypotheses are conspicuously testable, yet the only testing that has been accomplished has not produced very promising results. (An overview of several self-experiments with the proposed ergot alkaloids is given in Valencic's article, as well as in part 2 of this essay.) Let me work backwards through these objections, and bring to bear the clues I have mentioned.

Analysis

It is only possible to entertain objection 6 if we believe that the lack of positive results of testing the two ergot hypotheses precludes further experimental developments. Indeed, this appears to be Valencic's position as he concludes that the ergot hypotheses are "not very likely," and he "agree[s] 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..." Given that the references to barley and mint in the *Hymn to Demeter* fit well in several respects with the *C. purpurea* hypothesis, and that further evidence from Greek literature as discussed by Carl Ruck in *The Road to Eleusis* also implicates barley and mint, more than mere "doubts" should be required before insinuating that the recipe of the *Hymn to Demeter* was mere fabrication. The best and most believable lies or deceptions are ones closest to the truth, and even better are deceptions which actually are the truth disguised by the way of telling, or by leaving out some critical detail. If the *Hymn to Demeter* specifies barley, it is very likely that the *kykeon* has *something to do* with barley.² *Psilocybe* mushrooms have no relationship with barley whatsoever. And the mint specified in the recipe also would support the ergot hypothesis, since mint is a known remedy for the slight nausea often encountered with various lysergic acid compounds including the psychedelic ones as well as ergotamine taken as a remedy for migraine. The preponderance of evidence indicates we must further explore the ergot hypothesis, rather than abandon it for other possible psychedelic plants.

The proposal that the barley-mint recipe was a total fabrication designed to conceal the true secret also begs the question of why barley and mint would have been chosen as the fictitious ingredients. Why not other herbs, or plants, or even rare substances that were generally unavailable? Why implicate a principal foodstuff if in reality there were not the least connection? The barley-mint recipe cannot be abandoned so easily. In addition, some facts relevant to *Psilocybe* mushrooms, discussed below, make this alternate hypothesis rather far-fetched.

Objection 5 has recently become a moot point, as it has been convincingly shown that *C. paspali* was almost certainly not present in ancient Greece, neither its host *paspalum* grass.³ *C. paspali* might well have made a suitably psychoactive potion due to its alkaloidal content, very similar to the Aztec psychedelic, *ololiuqui*. Although several self-experiments with *ololiuqui* (seeds of two species of morning glory) or with its purified alkaloids ergine and isoergine have been inconclusive (see the mentioned examples in part II of this paper), I can personally assure readers that the alkaloids of *ololiuqui* are, when prepared correctly, quite capable of producing the entire range of powerful psychedelic effects. Ergine and its stereoisomer isoergine are the two principal psychoactive compounds of *ololiuqui*, and also the major alkaloids found in *C. paspali*, yet they are not found in *C. purpurea*. But the story of ergine and isoergine might be more important than has previously been suspected, as will be evident from what follows here.

Objections 1 through 4 all depend on the assumption that ergonovine and methylergonovine are the active principles resulting from the processing that was required to make the *kykeon* from *C. purpurea*. But self-experiments with these compounds, and the lack of other suitably psychoactive chemical candidates in *C. purpurea*, seem nearly to disqualify the ergot hypothesis from serious consideration. We seem to be at an impasse, with the best hypothesis marred by experimental weaknesses, and alternate hypotheses rapidly diverging from our most solid clues.

Although one might imagine that *C. purpurea* naturally parasitising barley in ancient Greece contained a more psychoactive blend of alkaloids than has been found in *C. purpurea* grown and tested in recent times, the fact that the psychedelic *kykeon* was so reliable for so long would indicate a corresponding long term reliability of content of the fungus which should thus have continued into the present, *i.e.*, today's *C. purpurea* is very probably quite similar in its alkaloidal spectrum to that of the same fungus parasitising barley in ancient Greece. Thus some suggestions that the known variability of ergot with varying hosts and growth conditions might resolve the question is unconvincing. Similarly unconvincing are proposals that the Eleusinian priests had discovered and cultivated some other species of ergot.

Further Considerations

Following are some further observations which should guide hypothesis formation: facts and probabilities drawn from what we know about ancient Greece, the Rite, the biology and chemistry of ergot and other proposed psychedelic plants, and other sources.

Relatively large amounts of the ingredient were needed,⁴ at a certain time of year, on demand. This fact argues against wild mushrooms or wild ergots such as *C. paspali*, and in favour of the hypothesis that the priests harvested the item from a plentiful, known, reliable, naturally-occurring and nearby supply. It is possible, however, that they had discovered how to augment supplies by simple procedures.⁵ Even with modern agricultural techniques, *C. purpurea* remains a common infestation of cereal grains, thus we may assume that this ergot was also common in the barley of the Rarian harvest, no doubt a large one. Thus even with a mild ergot infestation, sufficient quantities should have been obtainable. The grain harvest, and consequently the possibility to select out the ergot therein, occurs in late spring or summer, just in time for the September Eleusis celebration. The separation of ergot from the grain might also have been easy for the priests to do without undue observation, or without raising suspicions of what it was to be used for. A “purification” of the harvest in which “malformed grains” (see again footnote 1) as well as other contaminating material were removed might have been a cover-story.

However, as discussed above, *C. purpurea*, in its natural state, contains an alkaloidal content that is at best only moderately psychoactive, and with unfavourable toxic side-effects. *C. paspali* would have been a far more likely candidate on the basis of its alkaloid content, but is now ruled out. In fact, we might have ruled out naturally-occurring *C. paspali* on the basis of availability: Growing wild, it probably wouldn't have been reliable or copious enough to produce the quantities necessary, and collecting large amounts would have entailed scouting the countryside at great length, an activity easily observed by spies, and thus the recipe become easily known. Similarly, if *C. purpurea* were the active ingredient, and easy to process with a simple water extraction as suggested by Hofmann, could the secret so easily have been kept for so long?

Psilocybe mushrooms are ruled out, however. Several aspects of the Rite and what we know about wild mushrooms make the *Psilocybe* hypothesis unlikely. The rite was held every

year and at a precisely defined time in the month of September. Thousands of specimens of even the strongest *Psilocybe* mushrooms would have been needed, at a time of year when the climate of Greece was just barely subsiding from the summer heat and dryness. Although cooler mountainous areas of 1000 meters in altitude are within ten or twenty kilometres of Eleusis, it is very unlikely that such vast quantities of an uncommon wild mushroom could have been located so early in the year, like clockwork and in advance of the autumn rains, or that the hierophants could have collected such quantities every year and transported them back to Eleusis without the secret of their activity escaping. And as anyone who has collected wild mushrooms knows, they seldom appear on-schedule, in such dependable quantities, even when an area known to produce a certain variety has been identified.

If it is proposed that a *Psilocybe* species growing on the dung of domesticated herbivores might have been the *kykeon*'s secret, again we run into trouble. In the typical summer climate of Greece, herbivores' excretions would have dried so quickly in the heat that the hierophants would have had to irrigate them to even hope that mushrooms would appear, and they would have been lucky to produce even a handful under those conditions. And once again, it would have been a difficult operation to keep secret. After autumn rains, in November and December, animal dungs might well have produced their fungal consequences, too late for the rite unless we hypothesise that December's *Psilocybe* was stored for the following year: Again, a highly unlikely hypothesis for reasons too obvious to mention. But this observation does indicate another argument for ergot: the easily-dried sclerotia of ergot *are* quite capable of being stored, retaining their alkaloids for considerable periods, and certainly *could* have been stored for at least a year without preservatives, in containers of minimal size easily secreted in the confines of the temple. Thus stored ergot might have augmented supplies in lean years.

And of course the idea that the hierophants had perfected the cultivation of *Psilocybe* mushrooms is even more fantastic. I doubt that such a hypothesis even needs to be criticised. But one final argument might indicate that there weren't even any *Psilocybe* of note growing in Greece at the time. As noted in *The Road to Eleusis*, (p. 42) the Greeks were well acquainted with a wide range of inebriants and herbs, and how to prepare "wines" suitable for many purposes. If *Psilocybe* mushrooms had been common enough to use for the *kykeon*, they would no doubt have long been known and written about, and their secret impossible to keep. Neither the *Psilocybe* hypothesis, nor the hypotheses of naturally-occurring alkaloids of *Claviceps purpurea*, nor naturally-occurring *Claviceps paspali*, nor of course any of the other hypotheses that the *kykeon* was some kind of alcoholic beer made from barley, or that it was merely symbolic, etc. etc., will suffice.

We seem to have shown that *C. purpurea* is the most likely *kykeon* candidate while simultaneously proving its insufficiency to deliver a safe dose of alkaloids powerful enough to produce the full range of psychedelic effects. What is amiss? The most straightforward hypothesis is that the Greek priests had discovered some way to *transform* naturally-occurring supplies of *C. purpurea*: they must have found a technologically-simple process to alter the alkaloidal spectrum of ergot. At first this surely sounds like an impossible idea, yet some ergot alkaloid research of the 1930s, recently confirmed and until now overlooked by the various participants in the Eleusis debate, provides the key.

Ergine and Isoergine

Years ago, with the threat of my impending draft into the U.S. Army for an extended tour of Southeast Asia, I decided instead to "go on the lam," and departed for Mexico with the intention of researching the distribution and chemistry of some of the famous Central American psychoactive plants such as *ololiuqui*. It was during the course of these

investigations that I prepared astonishingly powerful extracts of *ololiuqui*, alluded to above. I had also been interested in the possibility of hydrolysing the alkaloids of *ololiuqui* in an attempt to prepare pure lysergic acid. This is a simple process, requiring only that the extracted ergine / isoergine content of the seeds be boiled for some time with a strong base such as potassium hydroxide. Although my researches were ended prematurely by unfortunate events, an important result for the present question was that I became well-acquainted with the chemical literature concerning lysergic acid, its production via hydrolysis, and the various conversions possible when treating ergot alkaloids in differing conditions.

I learned from the early chemical literature that the base-catalysed hydrolysis of ergopeptine alkaloids typical of *C. purpurea* apparently proceeded via a two-step process, the first and most rapid step resulting in ergine⁶ which was then more slowly hydrolysed to lysergic acid. The discovery of ergine was in fact accomplished in such a manner: Early work in the 1930s had found that treating ergotoxine (a mixture of three ergot alkaloids from *C. purpurea* extracts) with a base such as potassium hydroxide, yielded both lysergic acid and ergine.⁷ The details of the various experiments indicated that longer reaction times and higher temperatures favoured the complete transformation to lysergic acid, while short reaction times and lower temperatures resulted in significant amounts of ergine. Subsequent unpublished work by myself indicated the strong dependence of the hydrolysis on temperature, but weak dependence on base concentration.

Over the years I gradually forgot about these results until recently, musing over the objections to the theory of *The Road to Eleusis*, the “Ergine Hypothesis” suddenly appeared to me as a possible key to countering the objections. The hierophantic priests might well have discovered how to achieve a *partial hydrolysis* of the mostly toxic alkaloids of *C. purpurea*, resulting in an extract of ergot containing a blend of psychedelic compounds closely similar to the Aztec’s *ololiuqui*. The partial hydrolysis might thus also eliminate the toxic ergopeptine alkaloids, converting them to psychoactive ergine and isoergine.

But how were the hierophants to accomplish this feat, seemingly not duplicated until the 20th Century? It must have been a technologically simple procedure, and employed common ingredients, yet been easy to keep secret. Although potassium hydroxide was surely not available to the Greeks, the ashes of wood fires certainly were, and in fact a mixture of wood ash in water results in a solution of potassium of reasonably strong basicity. Is it possible that merely digesting powdered ergot with wood ash and water (and possibly wine containing 10% or so of ethanol to improve the solubility of the alkaloids), heating the mixture for a short period and then filtering off the liquid might have been the method of mixing the *kykeon*? I decided to ask the opinion of a colleague, an associate professor of chemistry at Loyola College in Maryland, and author of *The Chemistry of Mind-Altering Drugs*.

Footnotes to part 1:

1. *The Road to Eleusis: Unveiling the Secret of the Mysteries*, R. Gordon Wasson, Carl A.P. Ruck, Albert Hofmann. Harcourt Brace Jovanovich 1978. Republished in a Twentieth Anniversary Edition with additional material, Hermes Press, 1998.

2. It should be remembered that the appearance of ergot on its host has all through history led to the conclusion that ergot was merely malformed or sun-burned or “rusted” grains of the cereal host in question. It wasn’t until the 20th Century that ergot was generally recognised as another species altogether, a fungal parasite of the grain on which it appeared. Thus the Greeks very probably also made this error.

3. See Francesco Festi & Giorgio Samorini, "*Claviceps paspali* and the Eleusinian *Kykeon*: A Correction." *The Entheogen Review*, Volume VIII, Number 3, Autumn 1999.

4. A quick calculation of quantities necessary: Total alkaloid yield of *C. purpurea* may be about 1%, most of it ergopeptines with only a few percent ergonovine. The dose of ergine / isoergine (the active ingredients according to the arguments to follow concerning the method of preparation) should be between 1 and 5 mg as it has been recorded that its potency is about 1/10 that of LSD. Thus, per 1000 Eleusis participants we require up to 5 gm total alkaloids, corresponding to 0.5 kg of ergot. Modern yields of ergot from cultivation on rye can yield hundreds of kilograms per hectare. Thus it seems reasonable that the Greek priests could easily have harvested enough ergot from the nearby barley fields. Ripe ergots can easily be collected from the grain in the field, as they fall off the grain head even with strong wind. By contrast, the ergonovine hypothesis of *The Road to Eleusis* would require far greater quantities of *C. purpurea* since ergonovine only represents a small fraction of the alkaloid content of the fungus.

5. A likely possibility is that the priests had discovered how to spread an ergot infection using a water solution of the *honeydew* produced. Early in the growth of ergot on grain, the fungus causes the production of droplets of a sticky syrup on the grain heads, and insects attracted to this exudation transmit the ergot mycelium therein to other developing heads of grain. A solution of a few drops of honeydew in a litre of water produces a mixture that when shaken or sprayed onto other developing grain heads readily spreads the infection.

6. The process also produces isoergine, for in basic solution all such amides of lysergic acid rapidly approach an equilibrium mixture of the two associated stereoisomers.

7. References for the technical articles mentioned are to be found in the second section of this paper.

Mixing the *Kykeon*

Part 2

by Daniel M. Perrine, Ph.D.

Entheo-pharmacological Considerations

In agreement with what Peter Webster has discussed in the preceding portion of this article, it seems to me that it is quite possible that a “potion” containing as its main active ingredient lysergamide (ergine, the active entheogen in *ololiuqui*) and free from any more toxic alkaloids, could be reliably produced from ergot harvested from *Claviceps purpurea* infected barley using materials and processes available to the ancient Greeks. That is, such a procedure seems chemically possible for reasons which will shortly be presented in detail — although, of course, this possibility cannot be truly proved without actually carrying out a series of experiments in which ergot would be processed as hypothesized. Chemical possibility is, of course, not historical fact or even historical plausibility, but it can at least establish historical possibility.

A first objection to the suggestion that the Eleusinian mysteries owed some of their powerful effects and passionate loyalty to the entheogenic action of lysergamide in the *kykeon* is that lysergamide is not really a very good entheogen, certainly not when compared to the psilocybin in *nanacatl* or the mescaline in peyote. Indeed, the few documented descriptions of *ololiuqui* intoxication are far less dramatic than those employing LSD, mescaline, or psilocybin. Here is the full record, as far as I have been able to ascertain:

1. In 1955, Humphrey Osmond¹ took 60 to 100 seeds and experienced, according to Schultes and Hofmann, “a state of apathy and listlessness, accompanied by increased visual sensitivity. After about four hours, there followed a period in which he had a relaxed feeling of well-being that lasted for a longer time.”²
2. Hofmann compares the effects of *ololiuqui* rather unfavorably with those of LSD in his book, *LSD: My Problem Child*³ His description is as follows: “After the discovery of the psychic effects of LSD, I had also tested lysergic acid amide [lysergamide] in a self-experiment and established that it likewise evoked a dreamlike condition, but only with about a tenfold to twentyfold greater dose than LSD. This effect was characterized by a sensation of mental emptiness and the unreality and meaninglessness of the outer world, by enhanced sensitivity of hearing, and by a not unpleasant physical lassitude, which ultimately led to sleep.” As for the effects of the Mexican morning-glory seeds, he continues: “The psychic effects of *ololiuqui*, in fact, differ from those of LSD in that the euphoric and the hallucinogenic components are less pronounced, while a sensation of mental emptiness, often anxiety and depression, predominates. [Such]...weariness and lassitude are hardly desirable effects...in an inebriant.”
3. Solms, in a systematic comparative study of the psychopharmacology of lysergamide, confirmed Hofmann’s impressions, concluding that it “induces indifference, a decrease in psychomotor activity, the feeling of sinking into nothingness and a desire to sleep... until finally an increased clouding of consciousness does produce sleep.”⁴

4. Hofmann also tested the effects of isoergine (which is formed in much smaller amounts with ergine in the basic hydrolysis of ergot shortly to be described) and found that 2.0 mg orally produced a syndrome not very different from ergine, characterized by sensations of “tiredness, apathy, a feeling of mental emptiness and the unreality and complete meaninglessness of the outside world.”⁵

These seem to be the effects of ergine and/or isoergine when taken in the context of a scientific, clinical effort to disclose their psychopharmacology; and we can therefore presume that these would also be the effects of our hypothesized *κυκεών* under the same conditions. For the process we will describe would transform all the ergot alkaloids into ergine or isoergine. Even ergobasine (lysergic acid hydroxyethylamide, found in small amounts in *ololiuqui* and in some samples of ergot from Central Europe) would be converted to ergine. The only other likely psychoactive ingredient in the *κυκεών* would be wine.⁶

But these rather humdrum effects of ergine taken in the context of a dispassionate clinical experiment by volunteers already well-acquainted with the overwhelming visual and psychological effects of LSD and psilocybin by no means preclude the possibility, even the likelihood, that a potion containing ergine could powerfully catalyze and amplify the religious experience of the Eleusinian communicants of ancient Greece. Among the most important reasons for affirming this are the following:

Clinical versus Ritual Setting

There is no doubt that *ololiuqui* has been valued for centuries as a sacred entheogen in Oaxaca by *curanderos* of the Zapotec, Chinantec, Mazatec, and Mixtec tribes. And the principle psychoactive agent in *ololiuqui* (*Rivea corymbosa*, *Ipomoea violacea*) is just what we propose to have been the active agent in the *kykeon*: ergine (with smaller amounts of isoergine).⁷ If, to the vague and directionless alteration of mental state provided by ergine in the jejune setting of the research clinic, there is added the governing mind-set of religious belief coupled to the external setting of a centuries-old ritual, participants can and do experience a many-fold entheogenic intensification of the awe and dread felt before an ecstatic theophany of the *mysterium tremendum et fascinans*.

Indeed, other *pharmaka* with far less likely a priori plausibility if judged solely by their clinical psychopharmacology have been exploited for millennia in various cultures for their entheogenic effects: I am thinking particularly of *Amanita muscaria* (which despite its likely identity with the archetypal Vedic entheogen, *soma*, produces in secular settings only a bizarre state of incoherent delirium) and the presently much-despised *Nicotiana*, which “is not generally considered to be a hallucinogen. Yet, like the sacred mushrooms, peyote, morning-glories, *Datura*, ayahuasca, the psychotomimetic snuffs, . . . tobacco has long been known to play a central role in North and South American shamanism, both in the achievement of shamanistic trance states and in purification and supernatural curing. Even if it is not one of the “true” hallucinogens . . . tobacco is often conceptually and functionally indistinguishable from them. We know that Indians from Canada to Patagonia esteemed tobacco as one of their most important medicinal and magical plants and that some employed it as a vehicle of ecstasy.”⁸ Of course, many of these groups used tobacco or tobacco extracts in massive dosages in order to deliberately provoke a near-death experience. Yet, even in moderate amounts, and despite endless condemnation from Christian missionaries and Surgeons General, tobacco continues to be revered to this day as an integral part of the peyote ceremony by many adherents of the Native American Church.

Fasting

The *kykeon* was drunk *after a nine-day fast*. It was perhaps the sole beverage/food which broke that nine-day fast, and the drinking of the *kykeon* took place at the peak of a most solemn religious ritual.⁹ Probably few or none of the readers of this article have carried out a strict fast for nine days in the integral context of a life-transforming religious observation, and still less likely have any of them followed this by consuming, at the approach to the Holy of Holies, a dreaded sacrament with potent mind-altering effects. Peter Webster has given testimony to being himself deeply affected by *ololiuqui*. Let me add my own testimony to the effects of set, setting, and fasting:

About a quarter of a century ago, in the company of a dozen or so other recently-ordained Jesuits my age, I entered upon the consummatory event of the Jesuit spiritual training, the second and final 30-day Ignatian retreat. During the first part of Ignatius's *Spiritual Exercises*, which are the guide for this retreat, the "exercitant" is expected to unceasingly consider his utter unworthiness before God of aught but damnation, all the while living in total silence and solitude except for attendance at Mass and brief colloquies with one's director. Following these directives to excess, I soon fell prey to the Moloch of Christianity's most negative doctrines. By the third day, I had ceased eating, attending services, or talking with my director, walking alone instead for miles each day lashing myself with doubts and despair. After more than three days of eating nothing, I reached a rather grim metastable state at the nadir of resigned desperation: if I could never attain the love of/for God, I would simply go through the dead motions of devotion during the rest of the retreat. It was dawn. For the first time in four days, I ate, with total absence of any appetite: one slice of toast and a cup of sugarless black coffee. As I stared then blankly at the blank pages of my retreat journal, I was suddenly and overwhelmingly "transported." In some indescribable way and for what seemed like only a few seconds, I was suspended from the world of space and time and experienced myself in the immediate presence of "God." I say "God" because It was nothing at all like anything my imagination had ever before constructed. But it was *true* with an ineluctable certitude I have never been able to doubt. And it was probably the most pivotal moment of my life: whatever I have done since (including leaving the priesthood many years later) can be traced in some sense back to this experience; everything I have thought since of myself or "God" has been radically different. Was it the set and setting? Of course. Was it the fasting? I doubt that it would have occurred had I not fasted those four days — but then, I would never have fasted those four days (it was a completely spontaneous lack of interest in eating, not a planned exercise) had I not been gripped by an overpowering mind set which was completely reinforced by the setting.

Perhaps the experience was even to some extent the "entheogenic" effects of black coffee and toast. In the early part of the last century, week-long fevers could leave a sick person delirious and emaciated, and Thomas De Quincey writes in 1822, by way of comment on his own opium habit, that "Some people have maintained, in my hearing, that they had been drunk upon green tea; and a medical student in London, for whose knowledge in his profession I have reason to feel great respect, assured me, the other day, that a patient, in recovering from an illness, had got drunk on a beef-steak."¹⁰ I purchased a few seconds of Eternity with four days of fasting and a cup of black coffee; had I paid with nine days, ergine, and Pramnian wine, might I not have bought an hour?

I am certain that the duration and perhaps even the depth of this experience (although the second aspect seems much less quantifiable than the first) would have been greatly intensified if, say, I had drunk a cup of peyote tea instead of black coffee. Indeed, when I try to imagine what would have been the likely outcome of such a switch in beverages I am terrified and find myself quite grateful that only coffee was available. As Huston Smith says, "awe is not fun,"¹¹ and the experience was sufficiently awesome as it was.

Two reasons convince me that an entheogen would have powerfully intensified the duration and particularly the likelihood of such an experience (for in-depth experiences of this

sort are not that common, even among the many earnest Jesuits who have made this final retreat — at least not among the Jesuits I knew and know from my generation). The first is that I am now able to extrapolate backwards in time from a number of quite beautiful, awesome — even occasionally terrifying — religious theophanies which I experienced years later under the influence of entheogens.¹² The psychological and spiritual set and setting of these later experiences could not approach the once-in-a-lifetime situation of the retreat experience described above (although it was intentionally and earnestly religious), and so I was all the more impressed that the simple ingestion of a plant or chemical could invoke in such ordinary circumstances so profound an emotional and religious response.

The second reason is of course the famous “Good Friday Experiment” of Walter Pahnke, the “Miracle at Marsh Chapel,” where a group of seminary professors and students, under double-blind conditions, were given either psilocybin or an active placebo¹³ immediately before a three-hour Good Friday service. Those receiving the true entheogen experienced an intensity of religious emotion and exaltation greatly exceeding in statistical significance the experience of the controls, and they evaluated their experience just as highly when they were interviewed in a long-term follow up by Rick Doblin some 25 years later.¹⁴ This is as close to a scientific demonstration of the efficacy of entheogens in intensifying and facilitating religious experience as has yet been conducted. And yet, one can only guess how much even this profound entheogenic catalysis of a religious setting might have been still more amplified had it been experienced following a multi-day fast!

Sacred versus Profane Setting

No one disputes that ergine unmistakably and profoundly alters everyday consciousness — the only dispute concerns whether this alteration has, considered in isolation, properly “entheogenic” qualities. But as a matter of fact, even those psychoactive agents which by general consensus produce an alteration of consciousness most closely resembling and most likely productive of religious ecstasy (mescaline, psilocybin, LSD) *fail*, in the vast majority of cases, to produce anything like a religious experience when taken in a totally profane context. I am thinking of the hundreds of first-hand written accounts the college students I teach have given me over the years describing their use of psilocybe mushrooms or LSD. I would characterize fewer than 20% as empathogenic, and fewer than 10% as entheogenic. Doubtless the common use of large amounts of alcohol at the same time has much to do with this, but I suspect the usually banal intra- and interpersonal context, a context augmented by a nearly total absence of prior religious experience in any depth, is what succeeds in quenching so utterly the sacred flame. All of which is to say that entheogens, even the best of them, cannot create the “divine within” in and of themselves (to this extent, “entheogen” is a misnomer or an overstatement) absent anything at all numinous in set or setting. *Odi profanum vulgus, et arceo* admonishes Horace.

Synergine

It may seem to the reader that the arguments I have been making here could be turned on their head: if set and setting are so important to religious experience, why is there any need to hypothesize the presence of an entheogenic drug in the *kykeon* at all? Why? Because herbs, drugs, and potions *were* widely investigated in the ancient Greco-Roman world; because the *kykeon* was regarded with awe and dread as having an intrinsic psycho-spiritual potency (in a culture in which the distinction between divine or demonic possession and psychopharmacological alterations of consciousness barely existed: for most people, there was only the former, even with regard to Dionysian alcohol); and, consequently, because in such a cultural context the hierophants of a so deeply a revered and successful initiatory rite as that of Eleusis *must* have devoted their best efforts over the millennia of its existence to endow the *kykeon* with the most powerful and appropriate *pharmaka* they could find. Reflecting again on the

results of Walter Pahnke's study, it is clear that when an appropriately intense set and setting are present, nearly every participant who receives an entheogen experiences an unforgettably transformative theophany. On the other hand, those who experience only set and setting have such intense experiences relatively rarely. The stories and testimony from the Eleusinian participants, filtered through the darkening lens of history, seem to suggest that mystical and near-mystical experiences were so usual that we must postulate the synergetic and catalytic effects of an entheogen.

For all the numerous descriptions of entheogenically catalyzed religious experience suggest that the triad of *set*, *setting*, and *drug* (which last of course becomes an "entheogen" only in virtue of a particular context of set and setting) operate as independent variables, since each is indispensable. Yet despite this independence, they act in consort to *affect* and *effect* the final outcome not merely as their arithmetic sum but (particularly in the case of entheogenic drugs) in a deeply interpenetrating *synergisis*. Participants at Eleusis came away convinced that they had *seen* and *experienced* ("hierophant" means one who makes the Holy itself *manifest, to be seen*),¹⁵ in a numinous revelation, that they were individually destined for happiness after death. This is extraordinary in Greco-Roman religiosity, otherwise striking for its near hopelessness regarding the fate of the individual after death: *Immortalia ne speres*, admonishes Horace again; and yet "the Mysteries of Eleusis, . . . both to the community and to the individual, . . . supplied confidence in the face of all-devouring death."¹⁶ And the experience commanded immense loyalty: quite astonishingly, the secrets of the Eleusinian mysteries were never divulged. It seems to me that Something, something well beyond the sacrifice of a few animals and the attendance at a solemn ritual, must be invoked to account for this: what better Something than that central feature of so many primordial religions throughout the world — an entheogenic sacrament? And hence, abandoning all semblance of etymological propriety, and employing the argot of the pharmaceutical corporations, we might christen the generic drug ergine, when employed exclusively as an entheogen, as *Synergine*.

Chemistry

Due credit should be given to Peter Webster for his laudably tenacious and accurate memory. When he first suggested to me that ergine could be isolated by alkaline hydrolysis of ergot alkaloidal material, I was somewhat skeptical — why, if the other peptide bonds of ergot had been hydrolyzed, would not the amide linkage of ergine itself be hydrolyzed and the product be lysergic acid itself? Other organic chemists I proposed this to felt likewise. But Peter was right: ergine, not lysergic acid, was in fact the first characteristic ergot compound to be isolated in pure form. In 1932, Sidney Smith and Geoffrey Willward Timmis of the Wellcome Chemical Works in Dartford, UK, were the first workers to report a non-trivial product from the degradation of ergot alkaloids.¹⁷ The crystalline compound resembled the ergotinine or ergotoxine from which it was isolated in that it was an alkaloid which displayed all the characteristic color tests for the presence of an indole ring system. However, when its effect on rabbit uterine contractions were tested it was disappointingly found to be over 400 times less potent than ergotoxine. They named the compound *ergine*; later, it would be shown to be the simple amide of lysergic acid.

Two years later, Jacobs and Craig at the Rockefeller Institute in New York confirmed the results of Smith and Timmis and found that by using aqueous instead of methanolic alkali they could get a better yield of a new substance, lysergic acid.¹⁸ Later communications between these groups in England and the U.S. allowed a determination that ergine was indeed the simple amide of lysergic acid.¹⁹ Since the yield was greater and since lysergic acid proved to be a far more useful starting-point for further studies either of ergot itself or of any new derivatives with its properties, little further attention was given to the procedure of Smith and Timmis; instead, all efforts were directed to improved methods of isolating the commercially

important lysergic acid. (Indeed, these efforts continue to this day, and in the course of writing this article, Peter Webster put me in touch with Vladimír Kren, a highly regarded ergot researcher from the Czech Institute of Microbiology, who sent us a preprint of an article disclosing a procedure for maximizing the yield of lysergic acid from ergot.²⁰) It appears that preoccupation with the production of lysergic acid has led to some chemists to forget that simpler and milder versions of these same procedures will result in the production of ergine — *and it is precisely these simpler and milder conditions which would be accessible to the hierophants of Eleusis.*

How did the experimental conditions of Smith and Timmis (ST), in which ergine was produced from ergotinine, differ from those of Jacobs and Craig (JC), in which lysergic acid was produced from ergotinine? Fundamentally, the difference was a matter of concentration and temperature. ST refluxed ergotinine for one hour in a 1.0 M solution of potassium hydroxide (KOH) in methanol, which boils at 65° C, while JC refluxed ergotinine for an hour in a 1.4 M solution of KOH in water, which of course boils at 100° C. The reason that ST used methanol is that pure crystalline ergotinine²¹ is insoluble in water and unreactive even in boiling aqueous KOH. JC found that the resinous material remaining after ergotinine was rapidly dissolved in methanolic KOH and then evaporated would slowly dissolve with liberation of ammonia in boiling aqueous 1.4 M KOH. Martinková, Kren, *et al.* have been able to maximize the production of ergine/isoergine from ergotamine by using a less concentrated solution of KOH. They produce a mixture consisting principally of ergine and isoergine (total: 10.3 g) with relatively small amounts of lysergic acid/isolysergic acids (total: 1.65 g) from 30 g of ergotamine by refluxing for two hours in a 0.60 M solution of KOH, the solvent being a 1:3 mixture of water:ethyl alcohol.²² These results can be compared to a standard procedure for producing lysergic acid from ergotamine as given in Shulgin's *TIHKAL*, where 3.5 g lysergic acid is obtained by stirring 10 g ergotamine in a 1.2 M aqueous KOH at 70° C for 3 hours.²³

We suggest that conditions of solubility, pH, and temperature which would be equivalent in effect to ST's process, and result in the conversion of ergot to ergine, could be readily obtained by boiling crude ergot for several hours in water to which the ashes of wood or other plant material, perhaps barley, had been added. These are, of course, conditions easily achieved by the hierophants of Eleusis. Why would these conditions produce ergine? Wood ash contains potassium carbonate (pearlash), a strong base which for millennia was the usual material used to produce soap from animal or vegetable fats — an hydrolysis process (saponification) almost identical to the hydrolysis of the amide bonds of ergot. Wood ash has a pH of about 12, while the 0.60 M KOH used by MK has a pH of almost 14. But the Greek priests would have employed water as a solvent, since distilled methanol or ethanol was then unknown, and the resulting higher temperatures (and quite likely longer cooking times, which would tend to concentrate both product and alkali reagent) would compensate for the less concentrated base. As for the solubility problem encountered by ST and JC, we suggest that it would not obtain when crude ergot was used instead of crystalline ergotinine. This is because crude ergot contains from 30-35% fatty acids²⁴ which would both solubilize the ergot alkaloids of their own accord and even more so by virtue of the micelles formed when these fats were saponified by the hot pearlash.²⁵

Why would the hierophants consider ashes as a suitable ingredient in a sacred potion? We suggest the possibility that some sort of symbolism involving the resurgence of life from inanimate ashes may be involved. Kerényi points to a symbolic cluster of images surrounding birth in death, birth in fire, the ashes of the cremated votaries — all linked to the hope of life after death.²⁶ Persephone herself was looked upon as the goddess of fire, for “through her power the evil element was transformed into a kindly one.”²⁷ Perhaps also the ashes symbolized the immortality which Demeter wished to bestow on the little prince Demophoön, who was able to thrive and grow without food as long as she secretly placed him each night in the fire like a log. When Demophoön's mother, Metaneira, observes Demeter's strange action

and protests it, Demeter takes the boy from the fire — but now he is doomed with the rest of mankind to death. “Unknowing are ye mortals and thoughtless: ye know not whether good or evil approaches.”²⁸ An augmenting motive to any of the preceding is simply the reverence naturally felt towards the ashes remaining after a whole-burnt offering to the gods on a sacred altar. These are not ashes to be simply disposed of as one would ordinary hearth ashes; they partake of the sacral nature of the offering, and it is natural to attempt to incorporate them in some further sacral function. The same instinct can be seen at work in the custom, observed to this day in the Roman Catholic tradition, of reserving the ashes of the palms blessed on Palm Sunday to be used on Ash Wednesday of the following liturgical season.

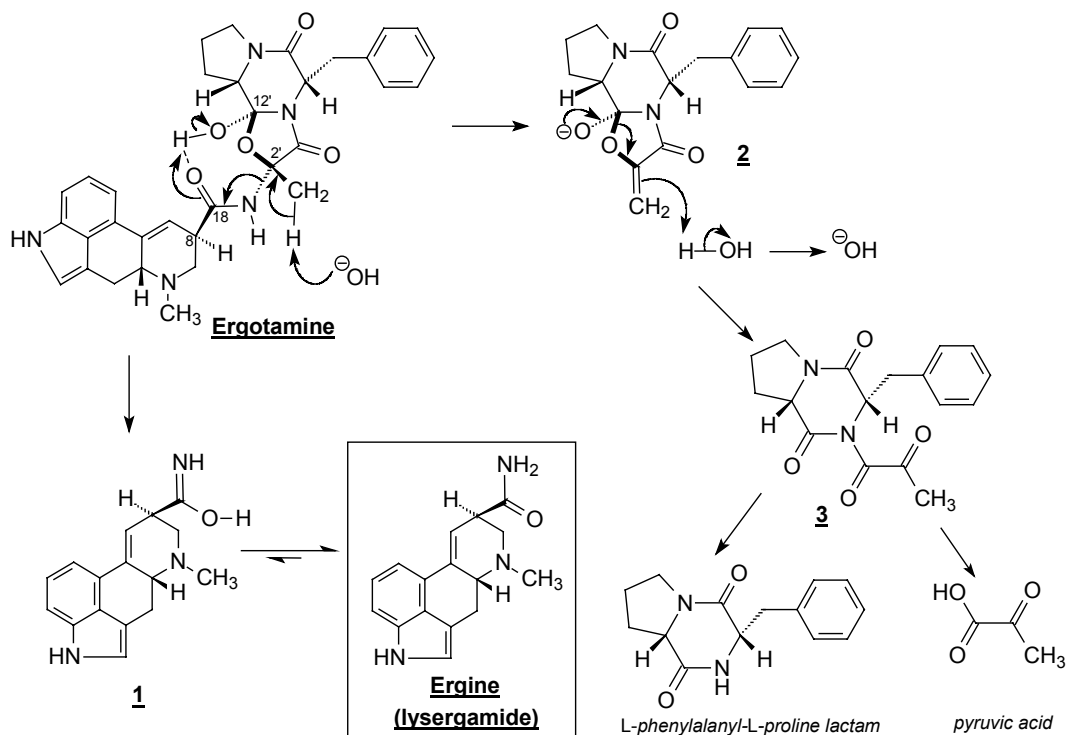
Would a potion containing enough ashes to hydrolyze ergot alkaloids be too basic and caustic to drink? We suggest several possibilities: most simply, a solution of potassium carbonate, if allowed to stand exposed to the air for a few days, would absorb enough carbon dioxide from the air to be turned into the relatively harmless potassium bicarbonate. Alternatively, as we have suggested earlier, a final addition of wine to the *kykeon* would neutralize the ashes, and this seems reasonable since in Homer the *kykeon* always contains wine. But in the Eleusinian myth, Demeter pointedly refuses to accept any wine to assuage her grief, since it would be “contrary to *themis*,” against nature. This is thought to be more than just an expression of her unwillingness to drink a beverage of joy while still in grief for her daughter; rather, she declines because wine comes from Dionysus, and the rape of Demeter’s daughter occurred on the Nysan Plain, where the Dionysian ground opened.²⁹ Indeed, the *kykeon* is possibly the Eleusinian drink in part because it stood as an alternative in opposition to Dionysian wine. A third possibility, then, is that the final mixture was neutralized (more effectively in any case since it is more acidic) by the addition of vinegar, which as spoiled wine, might not offend Demeter and/or might even be symbolic of participation in her grief.

We finally come to the most technical part of this discussion, which is a mechanism justifying the chemical transformation of ergot peptide alkaloids into ergine/isoergine and non-toxic secondary products. For this I owe much to discussions with Professor David Nichols of Purdue University, whose numerous discoveries and internationally acknowledged expertise in the realm of psychedelic chemistry, and whose much greater familiarity with the chemistry of lysergic acid, make him far more qualified to address this issue than I.

We feel that the mechanism shown in **Scheme 1** accounts adequately for the known experimental facts. We show ergotamine with a hydrogen bond forming an eight-membered ring from the carbonyl at C-18 to the hydroxyl group at C-12' since Ott, Hofmann, and Frey have given persuasive evidence that this corresponds to the internal structure of the natural alkaloids.³⁰ There are three mechanisms which could be invoked to account for the partial hydrolysis of ergotamine to ergine. The first and simplest would be an attack by hydroxide at the amide N of lysergic acid (the N bonded to C-18), which would cleave off ergine in one step. However, as Dr. Nichols points out, this would involve an S_N2 attack at a quite hindered center. A more accessible point of attack would be the removal by base of the proton of the C-12' hydroxyl, which would induce a cascade effect essentially similar to what we have pictured in **Scheme 1**. However, part of the data provided by Ott *et al.* supporting the existence of an intramolecular hydrogen bonding at this center is the reduced acidity of this hydroxyl group at C-12' relative to the unnatural *aci* isomers, where epimerization at the C-2' center excludes the possibility of hydrogen bonding to the lysergic acid carbonyl for steric reasons. (Nonetheless, the OH in question is still considerably more acidic than an ordinary alcohol due to the cumulative electron withdrawal of a nitrogen and an oxygen on C-12'.) In any case, a third point of attack is possible that obviates both of these difficulties, and that is what we have drawn in **Scheme 1**, where solvent hydroxide removes a proton from the methyl group attached to C-2', thereby initiating a cascade of reactions (probably more or less simultaneous) involving the intramolecular hydrogen bond and leading to the enol tautomer of ergine, **1**, which rapidly rearranges to **ergine**. The other product of this cleavage is **2**, which

should rapidly form **3** by extracting a proton from the solvent to regenerate hydroxide ion. **3** should itself be quite easily hydrolyzed in mild base to pyruvic acid and L-phenylalanyl-L-proline lactam, a harmless dipeptide formed from two essential amino acids. Under the mild conditions we envisage it is unlikely that any significant quantities of lysergic acid itself would be formed, since the amide bond of ergine would be hydrolyzed only very slowly by potassium carbonate. In any case, lysergic acid itself has almost no psychotropic effects.

Scheme 1



Footnotes to part 2

1. Osmond, H., Ololiuqui: The ancient Aztec narcotic. Remarks on the effects of *Rivea corymbosa* (ololiuqui). *J. Ment. Sci.*, 101:526-537.
2. Schultes, R. E.; Hofmann, A., *The Botany and Chemistry of Hallucinogens*. Springfield, IL, Charles C. Thomas Publisher, 1973 [Henceforward *BCH*], p.147.
3. Hofmann, A., *LSD, My Problem Child: Reflections on Sacred Drugs, Mysticism, and Science*, trans. J. Ott, Los Angeles: Jeremy P. Tarcher, 1983, pp. 124-126.
4. Solms, H., Relationships between chemical structure and psychoses with the use of psychotoxic substances," *J. Clin. Exp. Psychopath. Quart. Rev. Psychiat. Neurol.*, 17:429-433, 1956; quoted in *BCH*, p. 153.]
5. Hofmann, A., The active principles of the seeds of *Rivea corymbosa* and *Ipomoea violacea*. *Bot. Mus. Leafl., Harvard U.*, 20:194-212, 1963]; quoted in *BCH*, p. 153.

6. The κικεών which “fair-tressed Hecamede” mixes for Nestor and his comrades in the *Iliad* (xi. 624-641) contains barley-groats, grated goat cheese, and Pramnian wine. In the *Odyssey*, the κικεών which Circe mixes to transform Odysseus’s companions into swine (*Odyssey*, x. 234-235) similarly consists of “cheese, barley-meal, and Pramnian wine” — but she has added a drug (φαρμακον) to bewitch them. Later, Odysseus is able to rescue them by first taking the antidote “moly” provided him by Hermes (*Odyssey*, x. 290, 316-320). Interestingly, the unusual word “moly” (μόλυ) is probably related to the Sanskrit *mulam*, a root, with the compound *mula-karma*, meaning the “magical use of roots.” As well as making likely the presence of wine (or vinegar) in the Eleusinian sacrament, these citations show that an interest in drugs and potions added to a κικεών is as old as the earliest Greek literature.
7. Schultes, R. E., “An Overview of Hallucinogens in the Western Hemisphere.” In: *Flesh of the Gods: The Ritual Use of Hallucinogens*, Furst, P. T., ed., Prospect Heights, IL: Waveland Press, 1972, p. 20.
8. Wilbert, J., “Tobacco and Shamanistic Ecstasy among the Warao Indians of Venezuela.” In: *Flesh of the Gods: The Ritual Use of Hallucinogens*, Furst, P. T., ed., Prospect Heights, IL: Waveland Press, 1972, p. 55.
9. Kerényi, C., *Eleusis: Archetypal Image of Mother and Daughter*, trans. Manheim, R., Princeton, NJ: Princeton University Press, 1967, p. 177.
10. De Quincey, T., *Confessions of an English Opium-Eater*, Ticknor, Reed, & Fields: Boston, 1853 [reprint of the 1822 edition], p. 73.
11. Quoted in: O’Reilly, D., “Drugs were his door to the sacred,” *The Philadelphia Inquirer*, Sunday, June 18, 2000. Huston Smith, a widely-respected historian of religions who himself experienced a profound mescaline-catalyzed theophany at Harvard in the 1960s, was being interviewed about his recent book, which provides perhaps the best and most balanced evaluation of the phenomena of entheogen-altered or entheogen-induced religious states: Smith, Huston, *Cleansing the Doors of Perception: The Religious Significance of Entheogenic Plants and Chemicals*, New York: Tarcher/Putnam, 2000.
12. I wish I could say this with the same aplomb with which William James discusses his use of nitrous oxide and ether. But unfortunately, the present legal and emotional climate is not as open-minded as it was in his day. And so I feel compelled to add by way of legal exculpation, and while emphasizing that the United States Constitution still grants the presumption of innocence, that entheogenic experiences do not necessarily involve the violation of any law, even laws which are arguably adjudged as excessive and immoral. (Cf. Husak, D., *Drugs and Rights*, [Cambridge Studies in Philosophy and Public Policy, D. MacLean, Ed.], New York: Cambridge University Press, 1992.) This is because 1) in some countries some entheogens are legal which are illegal in the United States; 2) some entheogens which are generally illegal in the United States are not necessarily illegal in all circumstances; and that 3) a number of quite effective entheogenic chemicals have never been declared illegal in any country — some of these are easily synthesized and others can be ordered from most of the major chemical supply houses.

13. Pahnke, W., "Drugs and mysticism: An analysis of the relationship between psychedelic drugs and the mystical consciousness." Ph.D. dissertation, Harvard University, 1963. The experiment is also described in: Pahnke, W., "Drugs and mysticism," *The International Journal of Parapsychology*, **viii**, (1966), pp. 295-313; reprinted in: *Psychedelics: The Uses and Implications of Hallucinogenic Drugs*, Aaronson, B.; Osmond, H., Eds., Garden City, NY: Anchor Doubleday, pp. 145-165. The "active placebo" was nicotinic acid, which provokes a harmless flushing of the skin, tachycardia, and a rush of pounding blood to the head — symptoms which, although not very different from those caused by a cup of black coffee on an empty stomach — might suggest to the suggestible that they had taken a psychoactive drug. Using an active placebo was Pahnke's supererogatory effort to completely level the playing field between placebo and psychedelic. (Such probative integrity is rarely employed today: when, for example, a new drug with purported antidepressant effects is first tested on depressed subjects it is thrown into competition against a look-alike sugar pill which can have no psychic effect except through the subject's imagination. Nonetheless, those given placebo always show significant improvement over baseline, though not as much improvement as those given the genuine antidepressant. Such is the power of that most addictive of placebos, Hope.) However, in Pahnke's experiment, so intense and unique were the effects of high-dose (30 mg) psilocybin that within an hour it became apparent who had received the entheogen to both the controls and to the recipients of the active drug. See the discussion and evaluation by Rick Doblin cited below.
14. Doblin, R., "Pahnke's 'Good Friday experiment': A long-term follow-up and methodological critique," *Journal of Transpersonal Psychology*, **1991**, 23, 1-28.
15. Kerényi, C., *Eleusis*, p. 90-91.
16. Kerényi, C., *Eleusis*, p. 16.
17. Smith, S.; Timmis, G. M., "The Alkaloids of Ergot. Part III. Ergine, a New Base obtained by the Degradation of Ergotoxine and Ergotinine," *J. Chem. Soc.*, **1932**, 763-766.
18. Jacobs, W. A.; Craig, L. C., "The Ergot Alkaloids: II. The Degradation of Ergotinine with Alkali. Lysergic Acid," *J. Biol. Chem.*, **104** (1934), 547-551.
19. Jacobs, W. A.; Craig, L. C., "The Ergot Alkaloids: III. On Lysergic Acid," *J. Biol. Chem.*, **106** (1934), 393-399.
20. Martínková, L.; Kren, V.; Cvak, L.; Ovesná, M; Prepechalová, I., "Hydrolysis of lysergamide to lysergic acid by *Rhodococcus equi*," *J. Biotechnol.* In press.
21. Ergotinine is actually an equimolar eutectic mixture of ergocornine, ergocristinine, and ergocryptinine isolated by Tanret from ergot in 1875 (*Compt. Rend.* **81**, 891), but this was only discovered a decade later by Stoll and Hofmann (*Helv. Chim. Acta*, **26** [1943], 1570).
22. Martínková, L.; Kren, V.; *et al.*, *ut supra*. These workers intentionally maximize the production of an ergine/isoergine mixture because they have developed a

high-yield enzymatic procedure for converting this mixture into d-lysergic acid.

23. Shulgin, A.; Shulgin, A, *TIHKAL: The Continuation*, Berkeley, CA: Transform Press, 1997, pp. 490-491.
24. Buchta, M.; Cvak, L., "Ergot Alkaloids and other metabolites of the genus *Claviceps*." In: *Ergot: The Genus Claviceps*, Kren, V.; Cvak, L., Eds., Amsterdam: Harwood Academic, 1999, pp. 173-200. Cf. p. 194.
25. In modern times soap is made by treating fats with sodium hydroxide, NaOH, a base essentially as strong as KOH. But this process was developed by Leblanc and Chevreul only around 1790. Soap has been known since at least 300 BC, but had always been made by the much slower process of employing the potassium carbonate in wood ash, commonly called *pearlash*. After the Leblanc's work it became evident that soap could also be made from "lixivated pearlash" or *potash*, which was made by adding calcined limestone (lime, calcium hydroxide, CaOH) to the pearlash and precipitating out calcium carbonate. Lime was well-known to the Romans, who used it extensively in mortar for construction purposes, and oddly enough, the process of lixiviation was also known — it is mentioned by Pliny, who also discusses soap. But lixiviated pearlash appears not to have been applied to the production of soap until modern times. Indeed, the ancients did not use soap for cleansing; the usual process was to rub olive oil onto the skin after a bath, and then to scrape off the excess oil and dirt. Soap was used to some extent medicinally as a laxative, but primarily as an ointment for giving a bright hue to the hair — "rutilandis capillis." Pliny, *Historia naturalis*, xxviii. 51. There are numerous studies which have confirmed that micelles can greatly augment the rate of chemical reactions, particularly those which involve two phases as would be the case with our relatively insoluble material.
26. Kerényi, C., *Eleusis*, p. 92-93.
27. Kerényi, C., *Eleusis*, p. 101.
28. Kerényi, C., *Eleusis*, pp. 40-41.
29. Kerényi, C., *Eleusis*, p. 40.
30. Ott, H.; Hofmann, A.; Frey, A. J., "Acid-catalyzed isomerization in the peptide part of ergot alkaloids," *J. Am. Chem. Soc.*, **88**, (1966), 1251-1256.

Mixing the *Kykeon*

Part 3

by Carl A. P. Ruck

Barley-groats, water, and fresh mint. *Alphi* (or more fully, *alphiton*), *hydor*, and *glechon* (also called *blechon*). These are the known ingredients for the Eleusinian potion, the mixed drink or *kykeon*; these were the elements publicly announced and not part of the secret. Symbolically, the two plants represent various dichotomous antitheses that the aqueous *kykeon* mediates. First, the botanical, with the cultivated agricultural foodstuff as opposed to the wild gathered herb, the former the staff of life, the latter supposedly soporific. And the socio-political, with the sanctioned nuptial rite replacing illicit abduction and concubinage. And the religious, with the incorporation of the older chthonic deities into the Hellenized family of celestial Olympians. And both plants, in the pharmacopoeia of the midwife, the latter an abortifacient, the former an aid in parturition, inducing uterine contractions.

Cultivars, it was thought, are the product of human scientific intervention, without which they will revert to their poisonous inedible avatars. Sometimes, this is actually true. Thus the olive requires repeated pruning to prevent it from sending up a thicket of sprouts from its rootlets and returning to its fruitless natural state. The vine, too, needs pruning since it fruits only on new growth; and in ancient lore, its avatar was seen in the ivy, its sinister mimic, whose leaves and diminutive berries supposedly deranged the mind in their natural state, unlike the sophisticated intoxicant manufactured from the crushed grapes of the cultivar. An example from the New World is Indian corn, which if left unattended, drops its cobs of kernels to sprout all in the same spot, too close to grow without crowding each other out and becoming increasingly stunted like the original grasses from which it is hybridized. More to the point is the barley of the Eleusinian potion whose avatar was seen in the grassy weed that invades the tended plowland, the grain called tares, cockle, or darnel, *Lolium*, with the botanical epithet *temulentum*, 'drunken *Lolium*,' whose drunken toxicity derives from the ergot *Claviceps purpurea*, 'purple club-head,' descriptive of the enlarged deformed kernels formed by the dried sclerotia of the fungus, which spreads its poisonous contamination to the barley. In Greek, the weedy grass is named solely for these deformed kernels as *aira* or 'hammer.' The ergot itself was called 'rust' or *erysibe*, a metaphor that occurs also in English. As such, the botanic rust had its analogue in the destructive oxidization of iron that corrupts the metal utensils, returning them to the original ore. Demeter, the goddess of grains, could have the epithet *Erysibe*, for Greek deities often bear apotropaic names of their more sinister personae, just as Persephone is called the 'killer of Deadly Perse,' as the goddess who has displaced her more fearsome aspect as Perse.

It is only when we distance ourselves from the Eleusinian Mystery that we can expect to find mention of the ergot potion. Melampous, called 'black-foot' and the founder of a family of shamans, was a medicine-man, expert in understanding the speech of animals, birds, and insects, a gift he had received when two serpents licked his ears as he lay asleep. While attempting to win a herd of estrual cows as the bride price for the maiden Pero, named as the 'leathern food-pouch' like the *pera* in which was hidden some secret of the Eleusinian Mystery, Melampous was held prisoner by the 'Jailer' Phylakos, but he was able to gain his release by curing his captor's son of impotence. He learned from an old vulture, who had witnessed the event years ago, that Phylakos had inadvertently frightened his son when he approached him while gelding rams, bloody knife in hand. Phylakos had plunged the knife into an oak tree and gone to comfort the terrified child. It had lain there forgotten, rusting. Melampous scraped off the rust and administered it as a potion.

The symbolism of the rust is its mediation between primitivism and culture. From it can be extracted via alkaline hydrolysis, as we have seen, the visionary agent for the Eleusinian initiation. Pearlash or potash, called *tephra* and *spodos* in Greek, was known as an eye salve at least as early as Aristotle; and a century earlier, we know that the alkaline fluid called *konia* ('ash-water') was used for washing. There was also a *konia* derived from holy water and the ashes from sacrificial burnings that was used as a medicine. Hence, the procedure was within the expertise of the ancient pharmacologist, an art whose divine patroness was the third of the Eleusinian deities, Hekate. The Melampous myth also indicates a transition from human offerings to animal substitutes, for Iphiklos, the son of the Jailer, was probably not mistaken that the knife was originally intended for him and not the ram. Fiery immolation of human so-called volunteers and funeral pyres are frequent in the traditions of Eleusis. And in particular, Demeter, before teaching the Mystery, had laid the Queen's son Demophoön, lulled to sleep with poppy juice, nightly in the hearth like a log to burn off his mortality, intending to make him celestial, like the daughter Persephone, whose contamination with flesh she had not yet come to accept. This event of the myth was commemorated each year at the Eleusinian rite by the 'boy from the hearth,' a child from a noble Athenian family whose initiation was funded at public expense. The secret agency of the potash would, therefore, not be without significance, as the mediation between body and soul, the reconciliation of chthonic and celestial realms.

As to when the potion was drunk, there are those who would imagine it prepared well in advance and perhaps sipped sometime while on route to the sanctuary on the day of the initiation; this view is intended to allow time for the barley-groats to ferment slightly, producing some kind of weak beer. If, however, it were prepared in advance and in the possession of the initiates, it could hardly be a secret; nor were the Greeks, who were never interested in beer, although they knew of it, likely to interpret a mild alcoholic intoxication as an entheogenic experience, especially since wine, in other circumstances, or more exactly, strong ancient Greek wine fortified with herbal inebriants, offered precisely that in the rites of the god Dionysos. The only supposed evidence for the mixing of the *kykeon* in advance is a papyrus fragment of a comedy of Eupolis where a foreigner is seen with barley-groats (*krimnon*) on his upper lip while still in Athens; the circumstances, however, are probably the affair of the Profanation of the Mysteries, which involved exactly this, the drinking of the *kykeon* illegally at home as a recreational inebriant, since certain well-placed Athenians with connections to the Eleusinian priesthood had apparently learned the secret of the potion. And indeed, Eupolis's foreigner is described as being overtaken by a hallucinatory fever (*epialos*, like a nightmare) while on the way to the marketplace because of the *kykeon* he had drunk.

The ten-day fast imposed upon the candidates for the initiation has also been called into evidence to help explain how some mild inebriant could have induced the visionary experience that by all testimony occurred at the Eleusinian sanctuary. This fasting, however, could hardly have been total, but just the avoidance of certain foods; and the offering of the mystic sacrificial pigs, washed in the sea, would certainly imply a day of feasting during this period of the fast. The vessel for mixing the *kykeon* was emblematic of the initiation ritual; both metal and ceramic exemplars still exist, the latter imitating in clay the style of the former. Ninnion's tablet depicts the procession that left Athens in the morning of the final day to walk the Sacred Road to the village of Eleusis. The women carry the vessel on their heads, with boughs of myrtle inserted in its handles: the symbolism of the myrtle indicates that the potion is a mediation, both as the rite of marriage, which will supplant the abduction of Persephone and unite the chthonic realm with the celestial and also as the redemption of Semele, since this is the plant with which Dionysos paid for his dead mother's resurrection. Appropriately, therefore, the initiates are led by Iakchos, who is Dionysos personified as the call that leads them into the netherworld. The potion, however, was not drunk from the *kykeon* vessel (nor is its style suitable for this purpose), but from cup-sized jugs, which the men in the procession carry in their hands. Each of the events along the way suggests that the Mystery procession was a mimesis of a journey to the otherworld, whose gateway awaited them in the Cave of Plouto beside the great Hall of Initiation at Eleusis. As they left the plain of Attica, the bridge over the River Kephisos and the ritual of the *gephyrismos* (or 'bridging') was

practice for the narrow and dangerous passageway whose final locale would be the deep subterranean channel at the back of the Cave. Similarly, at the shallow saline lake called the Rheitoi or 'Streams' that marked the boundary of the Rarian plain in which lay the Eleusinian acropolis, the narrow bridge required that their carts be left behind and everything for the ceremony now be carried by hand. Here they were met by the hereditary priesthood of the Krokonidai, whose name suggests they are descended from the Athenian King Ion, Apollo's son via the *krokos* flower (supposedly the 'crocus') and after whom this month of Boëdromion ('Aid,' our September) was named for the alliance he made with Eleusis. The Krokonidai tied a 'string' or *kroke* to the right hand and left foot of each initiate, for such bows are emblematic of the joining between the realms. Their journey would be reversible, replacing earlier rites of human immolation. Hence, they had rested in Apollo's grove of laurel trees or *daphne* at the crest of Mount Aigeleos, before descending to the Rheitoi; and Artemis's temple lay still ahead of them at the entrance to the Eleusinian enclosure, beside the Well, the 'Well of Flowers,' the 'Virgin's Well,' where Demeter had rested when she first arrived at Eleusis, beyond whose watery surface at the base of the narrow shaft now resided her abducted daughter. (The grove of Apollo's entheogen, the temple of Artemis: because these were the two deities most implicated in the older rites of human sacrificial offerings.) There the initiates danced until nightfall, then passed with torches into the forbidden sanctuary, each accompanied by a sponsor, the mystagogue, up the incline, past the 'Laughless Rock,' which none would dare sit upon for fear of becoming stuck, like Theseus when he visited Persephone, and on into the Hall or Telesterion of 'Completion,' such being the metaphor in Greek for what we call by the Latin of initiation or beginning.

Inside, but certainly not the exaggerated thirty thousand of them as has been claimed, for the Hall could accommodate perhaps only a thirtieth of that, they ranged themselves along the peripheral steps, sitting probably, not standing all packed together, and watched as the priestesses danced in the darkness with lanterns and incense burners on their heads. The Mystery Baskets or Cista Mystica were opened, whatever they contained hidden until now from profane view. Then the *kykeon* was mixed. Barley. Mint. Water. One of the Eleusinian priests called the Hydranos was specifically responsible for the water, for this would have to be prepared in advance, with its hydrolyzed visionary agent from the ergots that, we may surmise, had been specifically encouraged to grow by contaminating some portion of the crop with the 'honey dew' of *Claviceps purpurea*, the sweet exudation of its ascospores. "I have opened the basket; I have drunk the potion," was the final password. The unused portion of this special water figured in the rite, probably now just as the initiates prepared for their spiritual descent into the netherworld to encounter the Goddess. Two round urns on unstable bases were emptied, with the chant, no doubt repeated again and again by the whole congregation, *Hye kye*, "Rain conceive." After their descent, she would surface back up with them all, amidst a brilliant light, a fire that supposedly (although it may be just a metaphor) could be seen from miles away, as the Hierophant opened the door on the antique temple within the great Hall, at the moment of her giving birth to the Mystery child Brimos, who is otherwise known in the Eleusinian myth as Triptolemos, the prince to whom Demeter entrusted the Mystery and the sacrament of cultivating barley. Brimo, as Persephone now was called, had given birth to Brimos, a son named after her in the older matrilineal fashion: the 'Terrible Queen with her Terrible son.' This Queen is ultimately the reunion of the three phases of the goddess, as maiden, mother and crone, represented as Hekate, three women in one, and the patroness of witchcraft and herbalism; and the son similarly triform as the 'Triple Warrior' Triptolemos. With the conclusion of the Initiation, the winter rain would begin and the seed of Persephone would be hidden in the plowland to fruit again six months hence.

The mint in the potion, *Mentha pulegium* or pennyroyal, in addition to its symbolism as the wild antithesis to the cultivated barley, may have functioned merely to scent the drink, for without infusion in boiling water it would not be likely to release enough of its toxins -- and it is specifically denoted as fresh mint; hence the potential abortifacient was surpassed by the superior magic of the ergot's birthing drug. It is possible, however, that the pennyroyal functioned in some way either to calm nausea (which is one of its uses in herbal

pharmacology) or to potentiate or catalyze in some way the psychoactive toxins of the hydrolyzed ergot. This would require further experimentation to determine. Pennyroyal, commonly called fleabane and fleawort, also would have been noted for its apotropaic effect on flies; hence its botanic name of *pulegium*, from *pulex*, 'flea.' In concentration, the terpenoid ketone pulegone from pennyroyal is lethal for humans.

This greater Initiation was called the 'Vision,' the *epopteia*, something that even a blind man could see, as is testified by the votive of Eukrates, found in the excavation of the sanctuary, who without eyes saw, like everyone else, the Resurrection of Persephone. It was the culmination of the rite that had begun six months earlier in February, in the month of 'Flowering' called Anthesterion. That was the Lesser Mystery, so-called, the *myesis* or 'Closing of the Eyes' and being lulled to rest. It was the time to plant the other crop¹ that would fruit at the end of summer. If one observed the ground carefully at that time, the ergots from the winter crop, which readily detach from the ears of barley and which for centuries would be thought to be nothing more than sun-baked kernels amongst the healthy grains, display their other mode of propagation, as the mycelia of the sclerotia, like any other fungus, send up their fruiting bodies, the mushroom caps with their spore-bearing gills. It is as if these special kernels of barley had become the seed of the wild and seedless mushroom. This Mystery was the rite of death that was prelude to the resurrection. In myth, it was the Abduction of Persephone as she plucked a special flower that was called the *narkissos*, a word from the Minoan language that was assimilated into Greek and which is the root for our word 'narcotic.' Similarly, the place where she found the *narkissos* was called Nysa in the myth, a word that persists into modern Greek as *nystazo*, to 'get drowsy.'

It is unlikely that every initiate could attend the public part of this rite since the dangerous winter seas would not be navigable until at least a month later, although on occasion the rite was performed out of season to accommodate personages of importance. It is probable that versions of the ceremony were enacted in locale Eleusinian sanctuaries. Nor is it likely that the *narkissos* aspect of the fearsome rite was enacted by anyone more than just the titular Sacred Queen of the city of Athens, who experienced a *hierogamos* or 'Sacred Wedding' with the god Dionysos as some kind of maenadic ritual with her female attendants in the temple in the Swamps, also considered as a part of her house called the 'bull stall.' This was the transmutation of a ritual that went back to Minoan religion and had once required the offering of human victims. In Athens, some aspect of the rite was enacted at the so-called 'Hunting Preserve,' the mystery sanctuary of Agrai, on the banks of the River Ilissos, where as late as the mid-eighteenth century there still stood a temple of Artemis. In myth, it was remembered as the place where the nymph Oreithyia (or 'mountain ecstatic female') was abducted from her sisterhood of maidens called the 'drug-ladies' or Pharmakidai to establish Athens' own special family relationship with the world beneath the earth. These maidens were also known as the Hyakinthidai or 'hyacinth ladies,' in commemoration of the Hyakinthos whom Apollo 'unwillingly' (for such is always the ruse in human immolation) escorted to Paradise. Both the *narkissos* and the *hyakinthos* are flowers from the pre-Greek language, as is also the name of the river. In this essay, I summarize for the purpose of clarity and directness ethobotanical and metaphoric items that are documented in other writings (most recently, RUCK & STAPLES & HEINRICH 2000).

The *narkissos* flower figures prominently in Minoan art, on a sacrificial knife and wall paintings and a golden ring, probably the emblem of a shamanic priestess, depicting women as 'bee ladies' experiencing a vision, and even a ceramic plate showing a Persephone snake-goddess with her flower. We can identify it as *Pancratium maritimum*, the sea daffodil, of the amaryllis family. Its ethnopharmacological traditions (as well as its botanical family, which includes the toxic daffodil, whose poisons from the bulb can be absorbed through the skin, and the autumn crocus (*Colchicum* spp.), the latter associated with Medea and Prometheus) suggest psychotoxicity. Some fifteen species of amaryllis are toxic. *Pancratium trianthum*, because of its entheogenic properties is reputedly often found growing around shrines and sacred areas (EMBODEN 1979: 79, fig 44). It bears lily-like flowers of pink and white stripes

on a naked scape. The bushmen of Dobe, Botswana, know this bulbous perennial as *kwashi*, a powerful sacred hallucinogen, capable of producing vivid and colorful visions. The bulb is not eaten, but rather it is slashed open and pressed onto self-inflicted wounds on the foreheads of participants. (One might compare the ritual flagellation of Spartan youths with squills.) The intoxicating principle is transported directly into the circulatory system, creating an immediate reaction. A related species is *Panocratium speciosum*, used by the Caribs of the West Indies under the name of *ognon* or *gli* as a powerful emetic. Some species are quite narcotic and are purported to have caused death by paralysis of the central nervous system; still others are classified as cardiac poisons. As always, ethnopharmacological expertise is essential for the ritual use of toxins.

The botanical name of *Panocratium* means the 'all-powerful,' like Christ as the Pankrator in Byzantine art, for its numinosity was assimilated in Christian mystery rites as the plant called *chreston*, an ancient corruption of Christ's name as the 'good' instead of the 'anointed' in Greek. It still goes by the name of the Virgin *Panaghia* in modern Greek. But somewhere along the way it also assumed the sanctity of the hoama or Soma which the Iranian Magoi used in their shamanic initiations, which is to say that it was assimilated to *Amanita muscaria*, the fly-agaric mushroom. This fungal sacrament persisted in Gnostic Christian sects, often labeled as heretical, most notably amongst the Manichaeans, whose rites, which thrived in the orient, were repeatedly reintroduced into western Europe by the Crusades. The role of fly-agaric in Eleusinian lore can no longer be denied now that the plant elevated between the two goddesses, and apparently extracted from the Mystery wallet or *pera*, on the bas-relief from Pharsalia, Thessaly, in northern Greece, has been definitively identified as a large mushroom.

Fly-agaric in Greek mythopoeia is involved with the Gorgon Medusa and the hero Perseus, as well as the mooing of estrual cows and the purple-red heifer maiden Io, who is herself a female version of the same name as the Athenian king Ion, both with names that are cognate with 'violet,' a holy plant in Greek ethnobotany and involved with the linguistic root for 'drug,' as in the word for drug-man, *iatros*. This entheogen of the primordial times was hidden away from profane view, hidden until it was revealed on the night of the Great Initiation, within the rockrose, *kisthos*, after which the Cista Mystica or mystery hamper of the Eleusinian rite is named, a wild rose with single petals. Hence the prominence of rose motifs in the decoration of the sanctuary. Some claimed that it was the phallus of Dionysos that lay hidden within; others that it was a *kteis*; with either, it was emblematic of fly-agaric, a hermaphroditic phallus that penetrates its own vulva as it grows, like the Baubo creature who first served the potion to Demeter. The rose, itself, resembles the opium poppy flower, for that entheogen is well attested in Minoan religion; and after its assimilation to the Hellenized rite, it, too, enclosed the secret. The opium capsules, moreover, resemble little pomegranate fruits, another Eleusinian motif; one common weed in fields of grain is called the pomegranate poppy because of the likeness of its capsules. The pomegranate itself as it fruits on its tree resembles apples, like the golden apples of the Hesperides, which one ancient vase painting identifies explicitly as mushrooms, for as the pomegranate hangs on its bough, the long calyx gives the red fruit a stipe like fly-agaric.

The fly-agaric is so named because of its attractiveness to flies, who seek out its toxins and were thought to be killed by it, although actually they revive after the experience. It would have been noted that the honey dew of the ergotized barley is similarly attractive to flies; it was long thought that it was just the sap of the grain exuded when the insects bore into the kernels. Fleabane, of course, represents the antithesis, repelling flies.

As for what the ordinary initiate could expect to experience at the *myesis*, we have only the traditions of the Purification. The rite is difficult to separate from the other aspects of the Anthesteria, which was a three-day wine festival (open to all and not restricted to the candidates for initiation) to which the ghosts of departed family members were invited. Orestes was said to have visited Athens during the festival, pursued by the netherworld sisterhood of Furies and the ghost of his mother Clytaemnestra, whom he had murdered, under orders from Apollo. He was exonerated and cured of his madness. Similarly, Herakles

was purified of the murder of his wife and children. Anyone guilty of murder was offered the same ritual purification in preparation for the greater initiation; but certainly not many candidates could have been murderers.

Perhaps we get closer to the meaning with Melampous, the same shaman who discovered the rust potion. Another of his spectacular cures was the daughters of Proitos, the Proitidai. They had gone mad, becoming consubstantial with the fly-agaric (for such is the common experience of those who partake of the sacramental food): they grew bald with scabby patches on their skin, like the white fragments of the shattered universal veil adhering to the fly-agaric's cap, and went mooing like cows in heat. Such estrual mooing was thought to be caused by the goading of the gad-fly or *oistros* (which gives us our word estrus) and which was also called the *myops*, 'squint-eye,' as in myopia, metaphorically appropriate for the *myesis*. He purified them at a temple of Artemis in Arcadia on the River Lousios. One of them died, but the other two he and his brother married, as replacements for Pero, the Mystery wife, whom both of them had claimed as wife in the affair of the rust potion.

The purification of Herakles, Orestes, and the Proitidai is always depicted as involving the sacrifice of a pig, for the animal offering was the substitute for human immolation; while the candidate sat, head shrouded, enthroned, the *thronosis*, on the 'fleeceling of a ram,' which is another metaphor for fly-agaric. The ordinary initiate, however, probably began this indoctrination for the Greater Initiation simply by becoming at peace with the revenant spirits and by feasting on the slaughtered pigs -- the pig offered in sacrifice as a token substitute for the death and *myesis* experienced by Persephone.

Footnote to Part 3

1. As would be expected, two crops were planted. The times of planting do not correspond exactly to the two Mysteries, which appear to be religious preliminaries for the actual plantings. Hesiod's *Works and Days* directs that the winter crop of Demeter's grain (presumably barley) should be planted when the voice of the migratory crane is first heard, *i.e.*, mid November (448), whether or not the rains have begun. The field should have been plowed in the spring and left fallow. If you wait for the winter solstice to plant, it is too late for the spring harvest. The winter crop should be planted when the cuckoo first calls, *i.e.*, March (486), if it has rained within three days as much as the height of an ox's hoof, which will assure a crop as good as the winter one. This crop is winnowed when Orion first rises at dawn, *i.e.*, July (587).

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