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The Soma-Haoma problem: Introductory overview and observations on the discussion[1] Jan E.M. Houben

*Je suis ivre d'avoir bu tout l'univers ...
Écoutez mes chants d'universelle ivrognerie.*
Apollinaire, 1913

*It is no sign of scientific honesty to attempt
to claim for what is in reality a branch of
historical research, a character of
mathematical certainty.
... it is only the rawest recruit
who expects mathematical precision where,
from the nature of the case, we must
be satisfied with approximative aimings.*
F. Max Müller, 1888, p. xiv.

1. Introduction

Practically since the beginning of Indology and Iranology, scholars have been trying to identify the plant that plays a central role in Vedic and Avestan hymns and that is called Soma in the Veda and Haoma in the Avesta. What is the plant of which the Vedic poet says (ṚV 8.48.3)[2]:

*ápāma sómam amṛtā abhūma_áganma jyótir ávidāma devān |
kím nūnám asmán kṛṇavad árātīḥ kím u dhūrtír amṛta mártasya ||*

"We just drank the Soma, we have become immortal, we have come to the light, we have found the gods. What can enmity do to us now, and what the mischief of a mortal, o immortal one?"

And which plant is addressed by Zarathustra (Y 9.19-20) when he asks divine blessings such as "long life of vitality" (*darəyō.jītīm uštānahe*)[3][4], "the best world of the pious, shining and entirely glorious" (*vahištəm ahūm ašaonəm raocəḥəm vīspō.xvārə əm*), and requests to become "the vanquisher of hostility, the conqueror of the lie" (*tbaêšō.tauruuā drujəm.vanō*)?

2.1. Early ideas and guesses on Soma and Haoma

Already Abraham Rogerius, the 17th century missionary from Holland, was familiar with the word *soma*, as he writes in his *Open Deure tot het Verborgen Heydendom (The open door to the hidden heathendom, 1651)* that it means "moon" in the language which he calls "Samskortam" [5]. But it seems that it was only in the second half of the 18th century that Europeans started to gather more detailed informations about Vedic rituals, including the use of Soma (in the meaning of the plant and the inebriating drink created from it). In an abridged text of the Jesuit Father Coeurdoux which remained unpublished but which was apparently the unacknowledged basis of J.A. Dubois' well-known work on the customs, institutions and ceremonies of the peoples of India (Abbé 1825), we read that Soma is the name of a certain liqueur of which the sacrificer and the Brahmins have to drink at the occasion of a sacrifice ("Soma est le nom d'une certaine liqueur dont lui [= celui qui préside à la cérémonie, J.H.] et les autres Brahmes doivent boire en cette occasion", Murr 1987: 126).

From Anquetil-Duperron (1771) [6] and Charles Wilkins (1785) [7] onward, the identity of the Avestan Haoma and of the Vedic Soma started to receive scholarly and scientific attention. In 1842, John Stevenson wrote in the preface to his translation of the Sāmaveda that in the preparation of a Soma ritual (*somayāga*) one should collect the "moon-plant". He identifies (p. IV) the plant as *Sarcostemma viminalis*. He moreover notes (p. X) that "[s]ince the English occupation of the Marátha country" the Somayāga was performed three times (viz., in Nasik, Pune and Sattara). In 1844, Eugène Burnouf observed in a study (p. 468) that the situation of the Avestan Haoma, the god whose name signifies both a plant and the juice pressed from it, is exactly parallel with the Soma of Vedic sacrifice. Windischmann (1846) discussed ritual and linguistic parallels between the Soma- and Haoma-cult in more detail. He reports (1846: 129) that Soma is known to be *Sarcostemma viminalis*, or *Asclepias acida* (the latter nowadays also known as *Sarcostemma acidum* Voigt), to which he attributes a narcotic-intoxicating ("narkotisch-berauschende") effect.

2.2. Soma-Haoma and the development of modern botany

The botanical identity of Soma and Haoma became problematized in the second half of the nineteenth century in a time when botany was trying to cope with the challenges of various exotic, newly encountered floras.

The use of the plant *Sarcostemma brevistigma* in recent Vedic sacrifices was acknowledged, but was this identical with the Soma which had inspired the ancient authors of the Vedic hymns? Max Müller expressed his doubts in an article published in 1855, in which he referred to a verse about Soma that appeared in a ritualistic commentary (Dhūrtasvāmin's commentary on the Āpastamba Śrautasūtra) and that was itself allegedly quoted from an Ayurvedic source. Adalbert Kuhn 1859, being primarily interested in Indo-European mythological parallels, accepts Windischmann's conclusions that the Soma-Haoma was already current among the proto-Indo-Iranians before they split into a Vedic and Iranian group. He leaves open the possibility that only the mythology and outward appearance of the Soma and Haoma are similar while the plants may be different. In 1881 Roth discussed in an article, "Über den Soma", the nature of the plant that was used in modern times, the plant of olden times, the development in which the plant became rare and inaccessible to the Vedic people, and the admission and prescription of surrogates in later Vedic texts. He thinks it is likely that the ancient Soma was a *Sarcostemma* or a plant belonging, like the *Sarcostemma*, to the family of *Asclepiadeae*, but not the same kind as the one used in current sacrifices. Roth's article was the starting signal of a discussion by correspondence in an English weekly review of literature, art and science, *The Academy* of 1884-1885; apart from Roth and Müller botanists such as J.G. Baker and W.T. Thiselton-Dyer participated. Julius Eggeling (1885: xxiv ff) gave a brief report of this discussion, which later on appeared again in Max Müller's *Biographies of Words and the Home of the Aryans* (1888: 222-242). From the title which Müller gives to the whole discussion, "The original home of the Soma", it is clear which aspect of the problem interests him most: the possible indication that the plant's identity might give about "the original home of the Aryans". Eggeling notices that an official inquiry is undertaken by Dr. Aitchison, "botanist to the Afghan Boundary Commission" (Eggeling 1885: xxiv). A few decades later, Hillebrandt (1927: 194ff) gives a more detailed report of the same discussion and adds references to a few later contributions to the Soma-Haoma problem. As in the case of Eggeling, Hillebrandt cannot reach a final conclusion regarding the identity of the plant Soma and Haoma in the ancient period. Suggestions noted by Hillebrandt vary from wine (Watt and Aitchison) and beer (Rajendra Lal Mitra) to Cannabis (B.L. Mukherjee).[8] In a footnote, Hillebrandt writes about a "Reisebrief aus Persien" by Bornmueller

according to whom the "Soma-twigg (also called Homa and Huma)" in the hand of a Parsi priest in Yesd could be immediately recognized as Ephedra. A few years earlier, Jivanji Jamshedji Modi, in his work on the "religious ceremonies and customs of the Parsees" (1922: 303, footnote 1), reported that "a few twigs of the Haoma plant used by the Indian Parsis in their ritual" were sent to Dr. Aitchison (spelled by Modi as Aitchinson) and identified by him as "twigs of the species Ephedra (Nat. order Gnetaceae)." Aitchison publishes his botanical descriptions of plants encountered at his trip through the "Afghan boundary" area in 1888. In the valley of the Hari-rud river he notices (1888: 111-112) the presence of several varieties of Ephedra, including one which he and a colleague are the first to determine, as well as the Ephedra pachyclada, of which he reports as "native names" Hum, Huma and Yehma.[9] Without committing himself to a candidate for the "real Soma plant", Oldenberg (1894: 177 and 366ff) argued that the Vedic Soma plant was a replacement of an earlier, Indo-European substance inebriating men and gods: mead, an alcoholic drink derived from honey.

2.3. Soma-Haoma, the biochemistry of plants, and human physiology

At the end of the nineteenth and the beginning of the twentieth century, another strand starts to be woven in the Soma-Haoma discussion. An active substance of the Ephedra plant, the alkaloid ephedrine, was found in the chinese herb Ma Huang (Ephedra vulg.) in 1885 by Yamanashi. In 1887 and 1892, it was isolated from the plant by Nagai, who gave it the name ephedrine.[10] In World War I, ephedrin and a number of other alkaloids (quinine, strychnine, yohimbine and harmaline), were tested on a group of soldiers; it was found that ephedrine worked most strongly on muscle strength as well as on the will to overcome fatigue.[11] In his 1938 *Lehrbuch der biologischen Heilmittel (Textbook of biological remedies)*, Gerhard Madaus (1938: 1259-1266) refers to a large number of studies on the effects, toxicity etc. of ephedrine appearing in German and American scientific journals, and notes their employment in the treatment of asthma and low bloodpressure. In the period between the two world wars, chemical substances (amphetamines) were explored which were close to ephedrine both in chemical structure and in physiological effects (Alles 1933, Fawcett and Busch 1998: 504). In World War II it was the amphetamines that were widely used on both sides.

2.4. A growing public for knowledge and experience of psychoactive substances

A book that we may now call a textbook of psychoactive substances was published in 1924, with an enlarged edition in 1927: Louis Lewin's *Phantastica: Die betäubenden und erregenden Genussmittel für Ärzte and Nichtärzte* (*Phantastica: narcotics and stimulants, for medical doctors and non-doctors*). Having researched several of the plants (the mexican "mescal-button" cactus) and substances (e.g. cocaine) himself in the preceding decades, he gives detailed discussions of the uses and abuses of a wide range of narcotics, stimulants and popular remedies that were either available in Europe from all parts of the world or that had been studied abroad by ethnographers. He is aware (1927: 216) of the Soma-discussion, and of the main proposals, *Periploca aphylla*, *Sarcostemma brevistigma* and *Ephedra vulgaris*, which, however, he does not see as capable of "producing the effects described with regard to the Soma" ("Keine von diesen Pflanzen kann Wirkungen veranlassen, wie sie von dem Soma geschildert werden"). He rather thinks that it may have been a "strong alcoholic drink created by fermentation from a plant." [12] An English translation of Lewin's book was read by Aldous Huxley in 1931, and it inspired him to write *Brave New World* (1932), the satirical fiction of a state where, with an inversion of Marx' statement, "opium is the religion of the people". The "opium" in Huxley's novel is a chemical substance which he calls "Soma" and which, dependent on the dose, can bring someone a happy feeling, ego-transcending ecstasy, or a deep sleep like a "complete and absolute holiday" [13]. In a 1931 newspaper article in which he refers to his discovery of that "ponderous book by a German pharmacologist" (i.e., Lewin's 1927 "encyclopaedia of drugs"), Huxley says that "probably the ancient Hindus used alcohol to produce religious ecstasy" (in Huxley 1977: 4), a statement apparently deriving from Lewin's hasty and unconvincing suggestion for the identification of Soma with alcohol. The same book also informed him that "the Mexicans procured the beatific vision by eating a poisonous cactus" and that "a toadstool filled the Shamans of Siberia with enthusiasm and endowed them with the gift of tongues." In 1958: 99, however, Huxley mentions another plant as the possibly real Vedic Soma: "The original Soma, from which I took the name of this hypothetical drug, was an unknown plant (possibly *Asclepias acida*) used by the ancient Aryan invaders of India in one of

the most solemn of their religious rites." His novel *Island* of 1963 gives a description of a more positive Utopian world in the form of a community that uses a drug not called Soma but "Moksha", and made out of "toadstools". It provides "the full-blown mystical experience." [14]

2.5. The main Soma-Haoma candidates until the 1960's

In the meantime, indologists, ethnologists, botanists and pharmacologists had continued discussing and researching various candidates for the "real Soma-Haoma". The main plants discussed are Ephedra, *Sarcostemma brevistigma*, and Rhubarb. In the latter theory, defended e.g. by Stein 1931, the reddish juice of the plant is thought to be the basis of an alcoholic drink. In the introduction to his translation of the ninth Maṇḍala of the Ṛgveda (Geldner 1951, vol. III), K.F. Geldner says that the Soma-plant "can only have been a kind of Ephedra." Geldner (1853-1929) worked on the translation of the ninth and tenth Maṇḍalas in the last years of his life. He justified his view by noting that a sample (apparently of a plant used in the Haoma-ceremony) given to him in Bombay by Parsi priests was identified as Ephedra by the renowned botanist O. Stapf; he also referred to a publication of Aitchison (Notes on Products of Western Afghanistan and North Eastern Persia, not available to me) and to Modi 1922: 303. In earlier publications such as the one on the Zoroastrian religion (1926) and his textbook on Vedism and Brahmanism (1928), Geldner had remained quite silent on the botanical identity of the Haoma-Soma, he only presented the two as identical. Geldner's German Ṛgveda translation became widely available only several years after World War II, but then it became the scholarly standard translation for the next so many decades.

3.1. The fly agaric (*Amanita muscaria*): a new candidate presented, criticized and defended.

An altogether new theory was launched by R. Gordon Wasson in a book that appeared in 1969.[15] Wasson (1898-1986) was an English banker as well as ethnobotanist and mycologist.[16] Together with his wife, he earlier published a book on "mushrooms in Russian history" in 1957. Wasson's 1969 book on a "mushroom of immortality" as the original Soma presents an impressive array of circumstantial evidence in the form of ethnographic and botanic data on the use of the *Amanita muscaria* ("fly-agaric") by isolated tribes in the far north-west of Siberia.

In other words, what was literary fiction in Huxley's novel *Island* appears now as a scholarly hypothesis.[17] However, what should count as substantial evidence in Wasson's hypothesis remains utterly unconvincing. Wasson wants to take only the Ṛgvedic hymns into account, from which he selects statements that would describe the Soma-plant. The hymns, however, are employed in the context of elaborate rituals and are generally directed to certain gods, e.g. Indra, Agni, Soma. The praises of the god contain references to mythological elements regarding his powers, feats and origination. To the extent that hymns to Soma contain references to concrete events – that is, to the extent they do not refer to cosmological themes or to microcosmic implications – these usually concern the ritual sphere. Wasson takes these references as detailed descriptions of the plant in its natural habitat, which is demonstrably incorrect. By isolating short phrases eclectically, Wasson does indeed succeed in collecting a number of statements which can be applied to the fly-agaric and its life cycle in nature. While the verses are apparently formulated so as to be suggestive of additional meanings (to allow interpretations concerning man and the cosmos), the immediate context of the isolated phrases usually make a link with the growing mushroom far fetched while the suitability for the ritual context remains. Even if occasionally mention is made of the mountains as the place where the Soma grows, the hymns of the ninth book of the Ṛgveda, which forms the main source of evidence for Wasson, deal with the Soma in the process of purification (*pávamāna*). As Brough observed in 1973: 22: "the Vedic priests were concentrating on the ritual situation, and on the plant, presumably in a dried state, at the time of the ritual pressing. It is thus improbable that the Vedic 'epithets and tropes' which Wasson believed reflected aspects of the striking beauty of the living plant were inspired in this way." [18] A number of reviews of Wasson's book appeared from the hand of anthropologists, botanists, writers, indologists, and historians of religion.[19] Those who were too hesitant in accepting Wasson's central thesis, Kuiper and Brough, received a rejoinder (Wasson 1970 and 1972a), where, however, we find repetitions of his earlier statements and more of the same but no indication that the problems pointed out by the reviewers were understood, let alone that these problems are convincingly addressed [20].

Separate mention is to be made of Part Two of Wasson's book (pp. 93-147), which is written by indologist Wendy Doniger O'Flaherty and is

entitled "The Post-Vedic History of the Soma Plant". This part is valuable for its discussion of researches on Soma and Haoma by Western scholars since the end of the eighteenth century to the time of her writing. The section on "the Brāhmaṇas and the Śrauta-sūtras" (pp. 95-98), concerning a crucial episode in Soma's "post-vedic history" for which extensive material is available, is impressionistic and eclectic and hence defective [21], but in spite of this both Doniger O'Flaherty and Wasson refer to it in their attempt to prove the absence of direct knowledge of Soma in this period.

Apart from its importance for the study of the use of the fly-agaric by tribes in distant North-East Siberia,[22] Wasson's book forms an undeniable landmark in the Soma-Haoma discussion. However, while initially he did receive more positive reactions to his central thesis from some indological reviewers (Bureau, Ingalls and Kramrisch), it hardly ever received full-fledged support from later indologists writing on the subject. One important point is however widely accepted: the Soma might very well have been a hallucinogen. The line of reasoning underlying the argument presented in Wasson 1969 was: in the light of the utterances of the Vedic authors, Soma cannot have been alcoholic, it must have been a hallucinogen.[23] In his review of Wasson 1969, Brough (1971: 360f) made an important observation. Quoting from Wasson's evidence on the consumption of fly-agaric among tribes in North-East Siberia, Brough points out that there are repeated references to coma induced by the fly-agaric. Those who consume the mushroom attain "an ecstatic stupor" or are transported into "a state of unconsciousness". Being "in a stupor from three sun-dried agarics" the hero of one of Wasson's sources "is unable to respond to the call to arms. But time passes and the urgency grows, and when the messengers press their appeal to throw off his stupor he finally calls for his arms." Brough rightly observes: "Here, it would seem, is a plant whose effects are totally unsuitable to stimulate Indra and human warriors for battle." In his answer to the problem indicated by Brough, Wasson sneers at Brough's self-admitted lack of specialist qualifications in chemistry and pharmacology and retorts (1972a: 15): "Wine as one of the Elements in the Mass is analogous. From earliest times (indeed since Noah's days!) wine has been known to cause nausea, vomiting, and coma; yet its sacramental rôle stands unchallenged."

The situation is, however, not the same. The "ecstatic stupor" and "state of unconsciousness" appear in Wasson's anecdotes of the use of fly-agaric as quite regular effects appearing quite soon after the consumption of doses that according to the descriptions are the normal ones (cf. also Nyberg 1995: 391). In the case of wine normal consumption seems rather accompanied by a whole range of effects from exhilaration to drowsiness, while "nausea, vomiting, and coma" befalls only those who consume it in great excess (or who drink bad wine). It is also striking that hallucinations and visions are reported in a considerable number of Wasson's *Amanita muscaria* anecdotes; they apparently occur quite soon after the consumption of the active substance of the mushrooms, and seem to be part of the experience actually sought by the consumer. Brough (1971: 361) draws attention to Ephedra, and to ephedrine isolated from *Ephedra sinica* (Ma Huang). Ephedrine, according to Brough, "is a powerful stimulant, and would thus be a more plausible preparation for warriors about to go into battle than the fly-agaric, which is a depressant."

In Wasson's presentation the choice was between alcohol and a hallucinogen. In Brough's formulation we have to choose between a hallucinogen and a stimulant, whereas an alcoholic drink is for him not a suitable candidate for the substance causing the Vedic people to attain exhilaration (*máda*). These seem to be the major options taken into consideration in the post-Wasson era of the Soma-Haoma discussion. In 1975 Frits Staal appended a discussion of the Soma-issue to his book on the exploration of mysticism. Staal is quite impressed by Wasson's argument (1975: 204: "his identification stands in splendid isolation as the only, and therefore the best, theory"). But he shows that he is not entirely unaware of its methodological shortcomings (1975: 202): "The only weakness that seems to be apparent for Wasson's theory is a certain unfalsifiability. A good theory should be liable to falsification. Theories which are true come what may and which can never be refuted by facts are uninformative, tautologous, or empty. In fact, apparent counterexamples to Wasson's theory can always be interpreted as consistent with the theory. When opponents point out, for example, that there are descriptions in the Veda which do not fit a mushroom, Wasson replies that the identity of the Soma was intentionally hidden by the Brahmans, or that these descriptions fit creepers or other substitutes." Staal thus saw that Wasson takes the Veda at once as the document on

the basis of which the Soma can be identified as a mushroom, and as a testimony of concerted attempts of Brahmins to mystify and hide this identity: a very flexible employment indeed of a source taken as crucial evidence.[24] Staal here distinguishes between only two options for Soma, alcohol and a hallucinogen, thus neglecting the relevance of psychoactive substances which have a primarily stimulant and ecstasy promoting effect (without excluding the occurrence of hallucinations or visions). In his book on the Agnicayana ritual (1983, I: 106), he formulates his position with reference to Wasson's thesis as follows: "Wasson's thesis implies, but is not implied by, a weaker thesis, namely that the original Vedic Soma was a hallucinogenic plant [i.e., not necessarily a mushroom, J.H.]. I regard this as the most important part of Wasson's hypothesis ... " The restriction of possible psychoactive candidates to substances known as hallucinogens, however, is unjustified.

A substitute for Soma mentioned in some of the ritual texts is Pūtīka. The Pūtīka is also one of the additives in the clay of the Pravargya pot – an object that is central in an esoteric, priestly ritual, the Pravargya (cf. van Buitenen 1968, Houben 1991 and 2000). In an article published in 1975 (later appearing as the third chapter in Wasson et al. 1986), Stella Kramrisch sought to prove that this Pūtīka was a mushroom having psychotropic effects. According to her (1975: 230), "Pūtika [sic], the foremost, and possibly the only direct surrogate for Soma, is a mushroom. When the fly-agaric no longer was available, another mushroom became its substitute. ... The identification of Pūtika [sic], the Soma surrogate, supplies strong evidence that Soma indeed was a mushroom." Kramrisch' identification goes via the mushroom called Putka by the Santals in Eastern India. As Kuiper (1984) pointed out, the linguistic connection suggested by Kramrisch does not hold. As pointed out in Houben 1991: 110, the ritual texts prescribing the Pūtīka as an additive to the clay of the Pravargya pot present it as an ośadhi (Kaṭha-Āraṇyaka 2,11+) and as something providing a firm basis from which he can attack the demon Vṛtra (Taittirīya-Āraṇyaka 2.9-10). Like other additives such as the animal hairs and the material of an ant-hill, it was not exclusively symbolic as Kramrisch believes, but had no doubt a pragmatic basis in providing extra strength to the clay pot which is to withstand extremely high temperatures in the ritual of the heated milk

offering. There is hence no basis to regard the Pūtīka as a mushroom, which takes away the additional evidence that Soma were a mushroom.

Rainer Stuhmann 1985 briefly reviews the Soma-discussion since Wasson 1969. He notes that critics of Wasson are right in maintaining that it is not possible to classify Soma, but that they went too far in entirely excluding a mushroom. He points out that even if the colour pictures which Wasson attaches to phrases from the Ṛgveda are seducingly suggestive, the questionable nature of Wasson's interpretation of the verses must be apparent to anyone who reads Geldner's or Renou's translation of the hymns in their entirety. According to him, there are nevertheless three points that can be considered settled:

- (1) From the Brāhmaṇas on, the original Soma was replaced by several other plants, and such substitution is already indicated in the tenth book of the Ṛgveda.
- (2) The original Soma cannot have been alcoholic, because there would not have been time for the fermentation of the sap after the pressing; moreover, both the Ṛgveda and the Avesta contrast the effects of Soma-Haoma with the alcoholic *súra*.
- (3) The plant grows in the mountains.

Stuhmann emphasizes that it is important to investigate the type of intoxication produced by Soma and to conclude on that basis what type of plant was used as Soma. He observes that several characteristics of the Soma-hymns, such as their "formless tangle of images and mystic fantasies [25]", importance of optic qualities in epithets of Soma, can be well explained by hallucinogenic influence. Hence he concludes that in case Soma would not be the fly-agaric it must at least be a plant containing alkaloids.

Stuhmann's argument is carefully phrased, but it is in several respects imprecise and contains a few crucial nonsequiturs. Stuhmann states that from the Brāhmaṇas onwards the Soma was replaced by substitutes – a distorted representation of facts that goes back to Wasson and Doniger O'Flaherty: as we have seen, it is true that substitutes are mentioned, but there is also still an awareness of the real Soma and of the fetching of Soma from near by in case the "top quality" Soma of mountain Mūjavat

is stolen. The view that substitution would have started at the time of the composition of the tenth book of the Ṛgveda is also already found with Wasson, and likewise, Wasson supports his statement with a reference to Ṛgveda 10.85.3

*sómaṁ manyate papivān yát sampiṁṣanty óśadhim |
sómaṁ yám brahmāṅo vidur ná tásyāśnāti kás caná ||*

"One believes to have drunk the Soma when they press out the herb.
The Soma which the Brahmans know, no-one consumes of that one."

It is difficult to draw from this verse the conclusion that the Soma is not a herb, as Stuhmann tries to do (1985: 91 note 3), apart from being something more abstract in the knowledge of Brahmans. Since the word *óśadhi* 'herb' would otherwise contradict Wasson's mushroom theory, he was forced to see in the first two pādas of the verse a reference to a substitute, and in the last two pādas a reference to the real Soma held secret by the Brahmans. This in itself is already a quite contorted interpretation. In the larger context of the hymn it proves to be untenable. The first verse of this well-known hymn of the marriage of Sūryā́ (fem.) with Soma (masc.) says that Soma is placed in heaven, and hence makes it immediately clear that verse three presents a contrast between the pressing of the Soma-plant on the earth and the Soma as moon which latter cannot be consumed directly. There is no suggestion of a substitute, only of an additional insight of the Brahmans with regard to a plant (*óśadhi*) which can be known and seen by all.

As for the exclusion of alcohol: the contrast with *súrā* is indeed there. Some process of fermentation or alteration of substances in the Soma plant can nevertheless not be entirely excluded in the period between their plucking and the employment in the ritual where the Soma-stalks are sprinkled on a number of consecutive days preceding the pressing. As for the mountains as the place of the Soma, it is clear that this applies to top-quality Soma. The Avesta (10.17) speaks of Soma occurring on mountains and in valleys (where the latter may, indeed, still be on high altitudes).

Next, Stuhmann wants to infer the type of relevant plant-substance from the type of intoxication produced by Soma. Stuhmann refers here to Ṛgveda 10.119 which is generally interpreted as the self-praise of Indra

who became drunk from drinking Soma. The speaker in the poem makes statements such as: after having drunk the Soma, one of my wings is in heaven and the other is being dragged on the earth. While the whole hymn could be seen as poetic fiction, one may indeed see here a reference to a hallucination or distorted perception, and the Soma would have a place in the causal nexus leading to it. This does not mean that Soma must have been a hallucinogen in the strict, modern sense of the term, especially because references to Soma outside this exceptional hymn are not normally indicative of serious hallucinations on the part of the authors. The latter point was argued by Falk (1989), who, however, went too far in trying to completely exclude the possibility that Ṛgveda 10.119 points to a hallucinatory experience. Even if we follow Stuhmann for the moment in his acceptance of a hallucinogenic effect of Soma, his conclusion at the end that the Soma plant must have contained alkaloids is both too wide and too narrow. Even if alkaloids often have psychoactive properties, instead of being predominantly hallucinogen they also may have quite different properties such as CNS-stimulant, sleep-inducing etc. On the other hand, hallucinations may have a basis in other substances than alkaloids: any substance that can interact with the biochemistry of the brain may induce distorted perceptions (among modern products petrol or gasoline would be an example; cf. already Lewin 1927: 268f). In addition, a lack of nutrients through fasting and thirsting may induce hallucinations as well. The same applies to the deprivation of sleep. Most importantly, whether a substance or the absence of substances does indeed produce a hallucination will usually depend to a large extent on the physiological and psychological condition of the subject, whereas the nature of the hallucination or vision will depend on his psychology and cultural background.

That the Soma was not a hallucinogen but a stimulant, probably from a species of Ephedra, was the view elaborated and defended by Harry Falk in 1987 at the World Sanskrit Conference in Leiden. In his paper (1989) he places previous theories in three categories: (1) Soma is hallucinogenic; (2) Soma needs fermentation and is alcoholic; (3) Soma is a stimulant. Emphasizing the Vedic indications for a stimulant effect of Soma which contributes to staying awake all night [26], he concludes that Soma-Haoma must again be identified with Ephedra. To establish his position he not only points out the properties of Ephedra and places

in Vedic literature indicating wakefulness and aphrodisiac effect in connection with Soma, but also argues that the Ṛgveda contains no references to hallucinations, not even in Ṛgveda 10.119 that is normally taken in that sense. (In the present issue George Thompson argues, convincingly I think, for a restoration of the "hallucinatory" character of this hymn.)

3.2 A fresh look at the Iranian evidence and a new hallucinogenic candidate

The same year 1989 saw the publication of the book *Haoma and Harmaline* by David Stophlet Flattery and Martin Schwartz. Here the authors base themselves mainly on Iranian evidence and provide an extensive and careful argument that the Haoma- and Soma-plant was in fact Harmel, which contains an alkaloid with hallucinogenic properties, harmaline (as well as harmine). The authors are aware (1989: 67-68) that for centuries Zoroastrians of central Iran have been using Ephedra – which they call *hom* – together with another plant – parts from a twig of the pomegranate tree – in their Haoma rituals. From the fact that in Nepal Ephedra is called *somalatā* ('Soma creeper') they infer that Ephedra was the plant used as Soma before it was replaced by *Sarcostemma* which grows in tropical areas of India and which was in use by Brahmins encountered by the Europeans in nineteenth century India (1989: 69). Yet, they think that Ephedra cannot have been the Haoma-Soma itself. For this, they have one main reason: we do not see that contemporaneous Zoroastrian priests using Ephedra become intoxicated. According to Flattery's and Schwartz's judgement, "sauma must have been commonly known in ancient Iranian society as an intoxicating plant in order for the credibility of the sauma ceremonies, and the authority of Iranian priests claimed from them, to have been maintained. Despite being commonly designated *haoma* (and the like), Ephedra is without suitable psychoactive potential in fact (and is not regarded in traditional ethnobotany as having any psychoactive properties at all) and, therefore, it cannot have been believed to be the means to an experience from which the priests could claim religious authority or widely believed to be the essential ingredient of an *intoxicating* extract." They conclude that (1989: 74) "It is therefore neither likely that Ephedra was a substitute for sauma [Soma-Haoma] nor that it was sauma itself, yet, according to both Iranian and Indian traditions, Ephedra was essentially linked with the extract drunk during the ceremonies. The only way of reconciling this

fact with the considerations of the preceding paragraphs is to view Ephedra as an archaic additive to the extract. Thus, Ephedra too would have been a soma-/haoma- 'pressed out (plant)', though not the only (or fundamental) one." The argument is carefully structured. However, it may be observed that their information regarding the properties of Ephedra and its alkaloids such as Ephedrine was apparently incomplete or outdated. It is true that Ephedrine and related alkaloids are best-known for their use in the case of asthma as well as low blood-pressure (hypotension), but it is since long known that it is also a general stimulant of the central nervous system. Hence its psychiatric use, e.g. in manic depressive disorder.[27] What the authors may not have been aware of in 1989 is that Ephedra would soon be marketed as the "natural" (hence supposedly safe, and in any case less restricted and regulated) alternative for the popular designer drug Ecstasy (XTC).[28] It is not clear on which impressionistic basis they conclude that the priests are not "intoxicated" nor what would qualify in their eyes as "intoxication," i.e. the *mada* of the Avestans and the *mada* of the Vedic Indians.[29]

3.3 The evidence from brahmanic texts and ritual

In 1990 the renowned specialist in Śrauta-literature C.G. Kashikar published his Identification of Soma, in which he argues for Ephedra as the original plant used in the Vedic and Zoroastrian rituals.[30] The main importance of this publication lies in the discussion of evidence of Vedic ritual texts which are chronologically immediately following the Ṛgveda (the latter forming the point of departure for Wasson's identification). Several Yajurvedic Saṁhitās, Brāhmaṇas and Śrautasūtras not only refer to the ceremonial purchase of Soma (where the seller is asked whether it comes from the Mūjavat mountain), but also to the contingency that the Soma is snatched away before the sacrifice starts. In that case new Soma is to be procured from the nearest spot. Only if Soma cannot be found the texts prescribe that substitutes are to be resorted to.[31] It may be assumed that the Soma that is procured from nearby is of lower quality than the stolen Soma from mountain Mūjavat, otherwise it would have been employed in the first place. Several Śrautasūtras prescribe Soma-juice in the daily offering of the Agnihotra for those sacrificers who desire the lustre of Brahman. This points on the one hand to authors being settled near the northern part of the Indian subcontinent where Soma was still within reach; on the other hand it is clear that Soma is a

plant that has a wider habitat than only a few mountains. The daily Soma of the Brahmins can hardly have been the precious top-quality Soma from mount Mūjavat required in the Agniṣṭoma. As for the botanical side of the issue, Kashikar relies mainly on research of Qazilbash and Madhihassan (their publications, mainly appearing between 1960 and 1986, were unavailable to me at the moment of concluding this introduction).

In a review of Kashikar 1990, Thomas Oberlies (1995) makes some important remarks, apart from giving additional bibliographic references. Oberlies accepts with Kashikar that the Brāhmaṇas and Śrautasūtras are aware of *some* plant being the real Soma. However, there is insufficient evidence for a positive identification. Referring to Brough 1971, Kashikar had rejected Wasson's identification of Soma as the fly-agaric a mushroom. He then simply takes the three main remaining plants that have been suggested by scholars as being the Soma, and by exclusion of the first two, *Sarcostemma brevistigma* and *Periploca aphylla*, he arrives at the conclusion that it must have been *Ephedra*. Even when the Brāhmaṇas and Śrautasūtras seem to suggest awareness of *some* plant as the unequivocally real Soma, Oberlies doubts whether it can be assumed that this was also the plant used in the Ṛgveda. This would only apply if there were an uninterrupted continuity between Ṛgveda and Yajurvedic texts. Oberlies mentions three problems with the identification of Soma with *Ephedra*:

- (1) The reddish-yellow (rot-gelb) colour is lacking (only the berries of *Ephedra* are red but the berries are not mentioned in the texts).
- (2) Juice pressed from Soma does not have a milky character, whereas the Ṛgveda speaks of "milking the (Soma-)stalks" and of Soma as the cow's first milk after calving (*pīyūṣa* 'beestings').
- (3) Oberlies' most fundamental problem with the *Ephedra*-identification is that *Ephedra* does not have the required hallucinogenic effect that is attested in the Ṛgvedic hymns.

Oberlies concludes his discussion with the observation that it is the interpretation of the Soma-intoxication on the part of the Vedic poets in the context of their referential frame which should receive more interest and attention, rather than to lay excessive emphasis on the nature of the substance (cf. Oberlies 1998: 166). Similarly, Tatjana Elizarenkova

(1996) has emphasized the importance of the style and structure of Ṛgvedic texts behind which there are insufficient traces of the direct impact of a psychoactive substance to make identification possible. Indeed, the importance of the cultural "construction" of textual representations of personal, including mystical, experience should not be underestimated. And what applies to the study of mystical experience will apply equally to a large domain of experiences resulting from psychoactive substances. After earlier generations of authors with what may be called various "essentialist" and "perennialist" approaches to mystic experience (William James, Rudolph Otto, Mircea Eliade, Aldous Huxley), a constructivist paradigm found wide acceptance in academic scholarship in the latter half of the twentieth century; it has found committed and persistent expression in a series of collective volumes on mysticism directed by Steven T. Katz (1978, 1983, 1992, 2000).

In spite of his affinity with a constructivist approach when he argues for studying the Vedic poet first of all in his religious context, from Oberlies' third, most fundamental ("wesentlichste") problem, it is clear that it is his unpronounced presupposition that indications for hallucinations in the Ṛgveda point directly to the use of a substance having hallucinogenic effects. As we have seen above, convincing indications for hallucinations, apart from the quite explicit Ṛgveda 10.119, are rare, and even if these should not be explained away, they are to be weighed against other indications which point to an absence of hallucination, but rather to a powerful stimulant suitable to divine and human warriors who cannot afford to perceive things that have no basis in objective reality.

The second point is to be studied against the background of Ṛgvedic poetic usage, where among other things thoughts can be obtained from an udder (5.44.13), or where an inspired poem can be compared with a dairy cow (3.57.1), or where there is no problem in speaking of the "udder of the father" (3.1.9). To satisfy the literalists who insist that, even with the extensive evidence that "milking" is a central and flexible metaphor for "deriving something precious from", *pīyūṣa* 'beestings' (formerly also spelt 'biestings', medical name 'colostrum') must absolutely be taken as having not only relational but also physical characteristics of milk, it can be pointed out that the long sessions of beating the Soma-plant with the **pestles** or press-stones can be expected

to give a pulpy-watery mixture in a first pressing which may have looked like the creamy fluid with special nutritious and protective ingredients that a cow produces for a new born calf. Such pulpy-watery mixture is what I saw come forth from the pounding of the Soma-substitute called Pūtīka (probably *Sarcostemma brevistigma*) in Soma sacrifices in Maharashtra and New Delhi. Several ideas may hence underlie the use of the term *pīyūṣa* 'beestings': the first juice appearing from the pressing is "beestings" by virtue of its being the first fluid produced from the stalks; it is "beestings" by virtue of its pulpy-watery, hence somewhat cream-like, character; it is "beestings" on account of its nutritious and protective potency. Finally, those invoking the Ṛgvedic references to beestings as an argument against Ephedra seem to have overlooked that the cow's first milk after calving is usually not white but may have all kinds of colours, from yellowish to greenish and purple, which does not constitute a contra-indication for its quality. This applies at least to the cows common in Europe, as I understood from a well-informed relative.[32] The metaphoric flexibility of terms in the sphere of "milking" in any case prevents *pīyūṣa* from being an argument against the Ephedra candidate. As for the problem of the reddish-yellow colour attributed to Soma: in Oberlies' brief statement, where he mixes up "reddish-yellow (rot-gelb)" and "red (rot)" or at least opaquely shifts from the one to the other, there is nothing that would invalidate Brough's 1971 extensive discussion of the colour-term in his criticism of Wasson.

A particularly problematic part in Oberlies' argument lies in his attempt to disconnect the evidence of Brāhmaṇas and Śrautasūtras from that of the Ṛgveda. Oberlies observes (1995: 236) that Kashikar presupposes that the plant used as Soma according to the Brāhmaṇas and Śrautasūtras is identical with that of the Ṛgveda. However, according to Oberlies this would apply only if there were an uninterrupted continuity from the Ṛgveda to the Yajurveda with regard to beliefs, rituals and cults. Since this cannot be accepted (Oberlies asks rhetorically: who could seriously believe this, with exclamation mark), statements in the Brāhmaṇas and Śrautasūtras would prove little for the Ṛgveda (with exclamation mark). A few paragraphs further (1995: 237), he acknowledges that Kashikar's conclusions provide new insights for the Brāhmaṇas. Here, the Soma may have been Ephedra. But, he adds, this was in all probability not the "original" (with exclamation mark).

In spite of all the exclamation marks, Oberlies' line of reasoning is neither self-evident nor convincing. At first, he makes the *general statement* that we cannot assume there was an uninterrupted continuity from the Ṛgveda to the Yajurveda with regard to beliefs, rituals and cults. On the next page, it is suddenly *most probable* that there is no continuity *in the specific case* of the knowledge of the Soma-plant. This is like observing first that one cannot be sure that traffic rules in Italy are the same as in France, and next that it is most probable that when the French drive on the right side of the road the Italians must drive left. It is well known that there are indeed important distinctions between the Ṛgveda and the Yajurveda and subsequent sources, including distinctions with regard to the ritual. However, these distinctions appear only against the background of a massive flood of elementary and structural continuities, which in many cases extend even to proto-Indo-Iranian times. It is also well-known that ritual in particular has a tendency to be conservative, even when interpretations and belief systems change. In the beginning days of Indology, scholars like Roth have emphasized the independence of the Ṛgveda from the later ritual texts. Vedic hymns would be expressions of "natural" lyrics which had little to do with the detailed liturgical practice as found in later texts. Close studies of scholars have in the meantime shown that there are numerous continuities and that the large majority of Ṛgvedic hymns suit ritual contexts which are still part of the "classical" ritual system as found in the Yajurvedic texts (cf. Gonda 1975: 83ff and 1978). In addition, in several specific cases such as the animal sacrifice (Bosch 1985) and the Pravargya (Houben 2000), the basic continuities and structural changes have been demonstrated in detail. In the case of the Soma-ritual, pervading not only the ninth Maṇḍala but the entire Ṛgveda, a comprehensive study and reconstruction of its Ṛgvedic form is still a desideratum even if we have an important preliminary study in the form of Bergaigne's "Recherches sur l'histoire de la liturgie védique" (1889; cf. also Renou 1962 and Witzel 1997: 288ff). In the light of this background of continuities, Oberlies' gratuitous assumption that there must be discontinuity in the case of the plant that is central in the most dominant Ṛgvedic Soma ritual is unsound. In the light of what we know of ritual in general and Vedic ritual and culture and in particular a much more reasonable starting point will be to assume that there is continuity unless there is an indication to

the contrary. Such indications pointing to a rupture in the knowledge of a specific Soma-plant, as briefly indicated in Kashikar 1990, are not found in classical Yajurvedic texts which continue to refer the practicing Brahman to an identifiable real Soma-plant even if he is occasionally allowed to sacrifice with a substitute.

A position somewhat parallel to the view of Oberlies was adopted by Frits Staal, who recently devoted an article to "the case of Soma" (Staal 2001).[33] In his usual challenging and stimulating style, Staal argues that the elaborate Soma ritual as known from classical sources replaces an earlier phase where the "real" Soma was known, and where ritualization was much less than later on. Hence the title of the article: How a psychoactive substance becomes a ritual. Again, in my view without sufficient basis two specific changes are assumed in the transition from Ṛgvedic ritual to the ritual of the Śrautasūtras: a loss in the knowledge of the original Soma and an increase in ritualization. He summarizes his main hypothesis in the form of a mathematical formula:

$$\text{ritualization} * \text{psychoactivity} = S$$

where S is a constant. Unfortunately, no data are offered to substantiate this formula. The fact that the Śrautasūtras are later than the Ṛgveda neither means that ritual was absent in Ṛgvedic times nor that it was "less" (in whichever way one may want to measure it) – even if there have been undeniable *transformations* as for instance in the transition from family-wise to school-wise organised ritual and religion, and the transition in the direction of a more Yajurveda dominated ritual. Even if there seems to have been more room for Ṛgvedic poetic creativity in earlier times, the activity of these poets followed strict ritual patterns and rules which are nowadays not known in detail but they are reflecting in regularities in the poetic productions. Since a substance may be "psychoactive" in various dimensions, nothing can be said about its general relation with ritualization – if at all we would have sufficient data about the latter in different stages of its development, and if at all, with all those hypothetical data, the latter would be quantifiable. The terms ritualization and psychoactivity remain unquantified in Staal's article and are probably fundamentally unquantifiable the way they are used. Staal's formula may hence be understood in a "metaphorically mathematical" sense, a bit like Bierstadt's proposal to take political and

social power to be the product of "men * resources * organization" (Bierstadt 1950 as referred to in Rappaport 1999: 473 note 13). Even in such a "metaphorically mathematical" sense, Staal's formula remains problematic – but can it perhaps be split into acceptable subformula's? One disturbing factor interfering with the phenomenon which Staal tries to catch in a formula is that ritual structure, including ritual utterances of linguistic forms, may itself be conducive to "psychoactive" results.[34] More substantial problems arise on account of the fact that there are psychoactive substances which produce effects in a specific dimension such that its increase is correlated not with a decrease but with an *increase* of a subject's need for "ritualistic" or "compulsive" actions.[35] There are, moreover, wider theoretical problems with the hypothesis and formula. Even when precise data generally become less and less if we go further back in time, there are theoretical reasons to assume that ritualization was more rather than less if we gradually approach the pre-human stage in the evolution of the human animal. Staal himself (1989: 110ff, 279ff) argued that ritual, which man shares with birds and other animals, precedes language as we know it with its lexical meanings, characteristic for humans. After having pointed out similarities between syntactic rules in language and ritual, he finds various reasons to believe that ritual is the cause: "this suggests that the recursiveness which is the main characteristic of the syntax of human language has a ritual origin" (Staal 1989: 112). In language, syntax would be older than semantics (Staal 1989: 112). Referring to the "unenunciated chant" of the Sāmavedins and to meditation mantras, Staal observes: "I am inclined to believe that what we witness here is not a curious collection of exotic facts, but a remnant or resurgence of a pre-linguistic stage of development, during which man or his ancestors used sound in a purely syntactic or ritual manner" (Staal 1989: 113). Staal also argued in detail that the similarity between Vedic mantras and bird songs are greater than that between mantras and ordinary meaning (Staal 1989: 279-293). The continuity with animal ritual has been argued for and demonstrated from quite a different angle by Walter Burkert, who took ancient Greek ritual as his starting point (cf. Burkert 1979 and 1996).

Against this theoretical background it is not convincing to let the Ṛgvedic Soma-ritual start in a romantic era in which man has direct religious experience through psychoactive substances and is not yet living a life replete with ritualizations.

An additional problematic point in Staal's article is the suggestion (Staal 2001: 771) that the descriptions found of Soma growing on high mountains would disqualify the "ubiquitous" Ephedra (the latter, in fact, not being all that ubiquitous: it does not occur in mid- and South India, and has a preference for high altitudes). The argument would be tenable only if our sources presented the Soma as growing on high mountains *exclusively*, which is not the case. The ritualist's question to the Soma-seller "is it from mount Mūjavat", as we have seen, asks for Soma-plants of top-quality, and it is presupposed that second-rate Soma-plants are more readily available.

4.1. Parameters of the Soma-Haoma problem

In the present state of knowledge, any claim that the Soma has been identified is either rhetorical or it testifies to the methodological naivety of the author. In reviewing some of the more recent contributions from Wasson onwards I have not hidden my own direction of thinking. In spite of quite strong attempts to do away with Ephedra by those who are eager to see Soma as a hallucinogen, its status as a serious candidate for the Ṛgvedic Soma and Avestan Haoma still stands. For more than the serious candidacy of Ephedra (or more generally of a stimulant), however, there are at present no arguments; and alternative candidates cannot be excluded. The attention paid to the nature of the psychophysiological state induced by the Soma, most dramatically emphasized by Wasson, is justified. The trap, however, in which Wasson and most scholars defending or attacking him have fallen is to assume that this psychophysiological state must be attributed directly to a psychoactive substance which brings about a similar state in modern, western, well-fed, and possibly smoking and drinking subjects. It must be clear that this is a shortsighted, anachronistic presupposition.[36] It is generally forgotten that participants in a Vedic ritual have undergone preparations which include fasting, restraining speech, sleep deprivation, sensory deprivation by spending the day in a dark hut, etc. According to the Śrautasūtras, the sacrificer has to fast "until he has become lean". Less is known about the specific preparations of the priests for the sacrifice. I am not sure whether such preparations are simply not current among modern Brahmins performing in Vedic (Śrauta) rituals, or whether they have been mainly neglected by observers. (I do not find a reference to such a practice in Staal's overview of the preparations to the Agnicayana

in Kerala, 1975, see Staal 1983, I: 193ff.) In any case, Stevenson, in the preface to his translation of the Sāmaveda (1842: VIIIff), mentions references in a Brāhmaṇa of the Sāmaveda to extensive austerities (including living on restricted food for months and complete fasting for several days) to be undergone by the priest-singers of the Sāmaveda in preparation for a performance. It is well known that fasting alone is a suitable preparation for the physiology to receive visionary experiences. Of the North-American Indians of the Plains it is known that they undertake their vision quests without the help of specific psychoactive substances (except for some who recently adopted the use of substances used by Mexican Indians), but subject themselves to rigorous fasting and thirsting.[37]

The human capacity for imagination, vision and hallucination seems to have been underestimated by Wasson and others. Merely because Apollinaire (1880-1918) published the "visionary" poem *Vendémiaire* in his collection *Alcools* we do not put the label "hallucinogen" on alcohol. A frequently quoted phrase from William Blake (1757-1827), the poet who was influenced by Emanuel Swedenborg in his enlightened Christian views, is "To see a world in a grain of sand, and a heaven in a wild flower, hold infinity in the palm of your hand, and eternity in an hour" – but there is no reason to assume that Blake's visions, reflected in his poetry and life anecdotes, were induced by a psychoactive substance.

Thus, with little Ṛgvedic evidence for hallucinations in the strict sense of the word – i.e., perceptions without any objective basis – and with otherwise a wide spread of Ṛgvedic statements pointing in the direction of a stimulant, the case for a substance which we label as a hallucinogen is far from compelling. Apart from 10.119, most examples which should testify to hallucinatory experiences of the authors can be easily explained as expressions in a professional tradition of poetic imagery.[38] On the other hand, the case for a stimulant still stands,[39] even with the evidence for occasional hallucinations and visions in the Ṛgveda, because (a) hallucinations and visions may occur even on account of the absence of consumption of food or the deprivation of sleep rather than on account of the consumption of specific additives; (b) stimulants allow subjects to remain without food more easily (hence their use in weight-loss programs), and by virtue of this they may be deemed to be able to contribute to hallucinations and visions; (c) in higher doses and under

suitable circumstances (e.g., exposure to rhythms and music), stimulants such as cocaine and MDMA (XTC) are reported to lead to ecstasy and hallucinations.[40]

Apart from the distinction between stimulant and hallucinogen, a case can be made for a substance with more subtle psychoactivity than the sensational fly-agaric proposed by Wasson,[41] in combination with an elaborate structure of beliefs, interpretations, and physiological preparations (fasting, silence) of subjects. Especially since Wasson, scholars interested in the identification of Soma have been overly focused on the single parameter of the psychoactive substance in the Soma-plant, and neglected the contributions of the ritual and the belief system to the construction of experiences reflected in Ṛgvedic hymns. Others did emphasize the belief system and the construction of experience, e.g., Elizarenkova and to some extent Oberlies, and they declared the search for the identification of Soma to be more or less hopeless. No convincing attempt has so far been made to balance the available indications for all major dimensions of the issue.

4.2 "Hummel's miracle" and other desiderata

In a posthumously published review of Wasson's book, Karl Hummel (1997: 90) once expressed the hope that perhaps some time, thanks to a miracle, a prehistorical find will give us pressing stones or wooden pestles with remains of the Soma-plant that can be investigated microscopically. As long as this does not happen, there are still useful fields of investigation to be explored in connection with Soma and Haoma. As for the "circumstantial" ethnobiological evidence, at present the evidence of the use of fly-agaric by tribes in distant North-East Siberia (according to Nyberg 1995 in the context of recreational use and by second rate shamans) may be regarded as cancelled by the evidence closer by of early and recent finds of mummies accompanied by bundles of Ephedra just across the Himalaya, as discussed, e.g., in Barber 1999 (esp. chapter 8) and Mallory and Mair 2000: 138, 152, 185-187. (For Soma and the life hereafter cf. ṚV 9.113.) A more critical evaluation of the evidence than the references by Mallory and Mair is needed with regard to the identification of Ephedra by various archeologists.[42] An investigation of the Vedic ritual and knowledge system, with much attention to the hymns on Soma, is one thing which has now received an important recent contribution from the point of view of religious studies

by Oberlies (1998 and 1999). Caland & Henry's description of the Agniṣṭoma on the basis of Vedic texts (1906 and 1907) is still the basis for the study of the ritual context of the Soma; it would deserve elaboration and updating in the light of new developments, e.g. new texts that have become available. Kellens 1989 and Skjaervø 1997 give overviews of achievements and issues in the study and interpretation of Avestan texts. A detailed description of the Yasna ritual in which Hom is prepared and offered appeared from the hands of Kotwal and Boyd (1991). Apart from occasional and dispersed remarks on similarities in structure and detail of the Vedic and Zoroastrian rituals (e.g., Hillebrandt 1897: 11), little has been done on the systematic comparison of the two. Next, the psycho-physiology of religious, and visionary or hallucinatory experiences, whatever their cause or occasion, is an important relevant field to be explored. The psycho-physiological effect of psychoactive substances and their possible role as catalysts for such experiences are to be investigated, taking into account the specific preparations undergone by the participants in the ritual. From the overview of the discussion it must have become clear that it has been suffering from a definite lack of terminological and conceptual precision, especially with regard to terms such as hallucination, vision, stimulant, and psychoactive. A noteworthy proposal with regard to psychoactive substances was made by classicist Carl A.P. Ruck and was accepted by Wasson in his later publication *Persephone's Quest*: it is better to speak of "entheogen" rather than of "hallucinogen", as the latter implies a judgmental falseness deriving from our modern outside perspective.[43] But it is not likely that terminological improvements alone are sufficient. Digging deeper, we stumble upon profound philosophical problems regarding the comparability of experiences, including mystical experiences, which can be understood as results of cultural and linguistic construction. Is there any experiential basis "beyond language" left, once we find ourselves able to formulate explanations of linguistic and cultural construction for diverse experiences related to the use of the same chemical substance in different cultural contexts?[44] In a comprehensive study of the Soma issue its implications for the theory of the "entheogen" origin of all religions should also be evaluated. According to this theory for which Soma as understood by Wasson was a major example and support, man would originally have known the psychoactive properties of plants, and religions would be based on the visions produced by these substances (cf. Wasson 1986 and a

considerable number of recent books in the category "New Age"; only recently I found references to a publication, Spess 2000, where an argument is made for new candidates for Soma: the *Nelumbo nucifera* and members of the *Nymphaea* genus: cf.

<http://www.innertraditions.com/titles/soma.htm>). As we have seen, due to the "constructed" nature of cognitive events even when incited by psychoactive substances, one cannot assume the connection between substance and vision was as simple and straightforward as propounders of the theory have suggested.

An additional field to be explored is the history of research into the identity of Soma-Haoma, and the interaction of this research with the state of growing ethnobotanical and psychophysiological knowledge, as well as with popular experience with psychoactive substances – starting at the end of the 18th century, through the 19th century, the 20th century before and after World War II, up to the present. An evaluative and bibliographic overview of the type Harry Falk (1993) wrote on the subject of the development of writing in ancient India would be most welcome and most useful to bring the discussion of the Soma-Haoma issue to a higher level (cf. Lehmann 2000 as an example of a recent publication characterized by a blissful neglect of textual evidence, positions held by various scholars and the arguments used to support them [45]). It is hoped that the present Introduction may serve as a small step in the direction of such an evaluative overview.

4.3 "Hummel's miracle" in Central Asia?

Under the circumstances sketched above, it was natural that something that almost seemed like the miracle hoped for by Hummel (1997) attracted wide attention. The relevant archeological find was not made in India but in Central Asia. The claim was that ancient ritual objects contained traces of plants, including some with well known psychoactive properties: poppy seeds and Ephedra stalks. This "Hummel's miracle" was presented in publications of Victor I. Sarianidi (e.g., 1994, 1998), and his conclusions on the findings of Ephedra have been received positively, though not uncritically, e.g., by Parpola (1995) and Nyberg (1995). The latter had already investigated specimens provided by Sarianidi but could not confirm Sarianidi's claims. He concludes a long review of textual evidence and pharmacological and ethnobiological data with the conclusion that "ephedras best meet both the textual and

pharmacological requirements for the botanical identification of soma/haoma," but points to the need of "further archeological discoveries" before conclusive evidence can be provided.

5. The Leiden 1999 Workshop on Soma-Haoma

It was in order to subject these indications for a "Hummel's miracle" in Central Asia to closer scrutiny that a workshop was organized in Leiden in 1999. Since Sarianidi's claims with regard to early Zoroastrian and Vedic religion focused on the presence of Ephedra, this candidate for the original Soma and Haoma was central in the workshop – which was a workshop in the real sense of the word: the contributors were not required to present a finished paper but were rather invited to share with others in the development of their thought on the subject. At the workshop (see the brief report below) Prof. Sarianidi presented his case, and he moreover generously offered to send some specimens of the material (a sediment in a pitcher) in which he claimed traces of Ephedra, papaver and hemp were present. The specimens arrived a few weeks after the workshop, and Prof. C.C. Bakels, paleobotanist and specialist in papaver cultivation around the Mediterranean and in ancient Europe, enthusiastically undertook their investigation in spite of her busy schedule. After a few months I received messages indicating that no proof could be found of any of the substances indicated by Sarianidi. Rather than hastily sticking to this conclusion, Prof. Bakels made efforts to show the specimens to other paleobotanists whom she met at international professional meetings. At the end of this lengthy procedure, no confirmation could be given of the presence of the mentioned plants in the material that was investigated. The traces of plant-substances rather pointed in the direction of a kind of millet. Since it was felt that proceeding with a publication on the basis of the presentations in the workshop was not useful as long as Bakels' research was in progress it was postponed till her results appeared, that is, until 2002. In the meantime only a few contributors of the 1999 workshop were left who were intending to offer a paper for publication. On the other hand, we are happy that George Thompson, with a longstanding interest in the Soma-Haoma problem, was found willing to contribute a paper although he did not participate in the 1999 workshop.

The general report of the workshop, the research report of C.C. Bakels, and George Thompson's paper on "ecstasy in the Ṛgveda" are now

published, together with the present introduction, in this first part of the EJVS Soma-Haoma issue. The second part of this issue is to contain a reworked version of the paper I presented in the 1999 workshop, as well as, hopefully, some other forthcoming papers and possible reactions to the present part.

Some relevant sites and links:

A. TITUS (<http://titus.uni-frankfurt.de/indexe.htm>) and GRETIL (http://www.sub.uni-goettingen.de/ebene_1/fiindolo/gretil.htm#Veda) for the Ṛgveda and other Vedic Texts.

B. Avesta.org (<http://www.avesta.org/sitemap.htm>) for Avestan texts with (often antiquated) translation.

C. Materials for the study of Vedic ritual (<http://www.jyotistoma.nl/>): introduction and overview of the Soma-ritual, example translation of first hymn of the Soma-book Ṛgveda 9

(http://www.jyotistoma.nl/EN/First_hymn_of_the_ninth_book.html) and videoclip of Soma-pressing and of a Sāman sung at a Soma-ritual.

D. Amanita muscaria or Fly-agaric:

http://www.mykoweb.com/CAF/species/Amanita_muscaria.html,
http://www.zauberpilz.com/zauberpilzgalerie/amanita_muscaria_index.htm.

E. Peganum harmala or Syrian rue, Photograph by Henriette Kress:
<http://www.ibiblio.org/herbmed/pictures/p10/pages/peganum-harmala.htm>.

F. Flora of Asclepiadaceae, by Li Ping-tao, Michael G. Gilbert, W. Douglas Stevens (incl. information but no photos on Periploca, Sarcostemma):

<http://hua.huh.harvard.edu/china/mss/volume16/Asclepiadaceae.published.pdf>.

G. Soma-substitute "Pūtīka" used in Soma-sacrifice in Barsi, Maharashtra, 2001, probably to be identified as *Sarcostemma acidum* (Roxburgh) Voigt (*Asclepias acida* Roxburgh, *Sarcostemma brevistigma* Wight & Arnott), photo (© J.E.M. Houben):

<http://www.jyotistoma.nl/EN/images/Putika.jpg>.

H. Species of Ephedra: Photographs by Henriette Kress:

http://www.ibiblio.org/herbmed/pictures/p05/index_3.htm, under *Ephedra equisetina* and *Ephedra sinica*; Christopher J. Earl's

Gymnosperm Database hosted by Univ. of Bonn, Dep. of Botany:
<http://www.botanik.uni-bonn.de/conifers/ep/index.htm>; a creeper of the family of Ephedra – of interest in the light of references in post-Vedic texts that Soma were a creeper – is known as Vine Ephedra (I don't have information on possible similar kinds of Ephedra creepers in Asia): <http://aggie-horticulture.tamu.edu/ornamentals/nativeshrubs/ehpedrapeduncula.htm>; healthnotes online on Ephedra:
<http://www.hollandandbarrett.com/Herb/Ephedra.htm>.

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Michael Witzel): 257-345. Cambridge, Mass.: Dept. of Sanskrit and Indian Studies, Harvard University.

Notes

[1] This Introduction is an elaboration of introductory remarks in my paper presented at the Leiden seminar on the Soma-Haoma issue (Leiden, July 3-4, 1999). For this seminar, support was received from the Research school CNWS – School of Asian, African, and Amerindian Studies (Leiden University). My own research in connection with the topic of the seminar was funded by the Royal Netherlands Academy of Arts and Sciences (KNAW), of which I was a research fellow from July 1999 till March 2003. I am grateful to the participants in the workshop for their contributions in the form of papers, remarks and discussions. Leonid Kulikov deserves special mention for his kindness to assist in occasional translations from Russian, and after the workshop to mediate between Leiden and Professor Sarianidi when the latter was staying in Moscow. Michiel de Vaan kindly helped me get hold of some of the publications I needed. I am indebted to Frits Staal, George Thompson for their critical reading of an earlier version of this introduction. I thank Michael Witzel for accepting to devote an issue of the Electronic Journal of Vedic Studies to the discussion on the Soma-Haoma problem.

[2] In the email-version, the transcription of Sanskrit follows the conversion table for Old Indic/Sanskrit of TITUS (Thesaurus Indogermanischer Text- und Sprachmaterialien), <http://titus.uni-frankfurt.de/software/fonts/titaind.htm>, with the exception that names that do not appear in quotations or references to the Sanskrit word have their first letter capitalized. This creates occasional ambiguities which, however, disappear against the background of a general basic knowledge of Vedic/Sanskrit.

[3] In the email-version, the transcription of Avestan follows the conversion table for Avestan of TITUS (Thesaurus Indogermanischer Text- und Sprachmaterialien),

<http://titus.uni-frankfurt.de/texte/avesta.htm> .

[4] A regular epithet of Haoma, *dūraoša*, has been interpreted as "Todtwehrer" or the one who keeps 'destruction' or 'perdition' (*aoša*) 'far away' (*dūra*) (cf. Bartholomae 1904 s.v.). Stuhmann's suggestion (1985: 87 and 92 note 20) that the word derives from **dru-oša* "holzbrennend" does not seem convincing in the context where it occurs; Flattery and Schwartz (1989: 130) want to understand it as "keeping destruction far away" in connection with apotropaic powers of the Haoma-plant which it would especially have when it is burnt. However, if the association with burning is part of the term's synchronic semantics it would not suit contexts such as the beginning of Y 9 where there is no burning but a pressing and libation of Haoma. See for further references to the discussion Mayrhofer 1992: 733.

[5] Rogerius, *Open Deure tot het Verborgen Heydendom*, ed. Caland 1915 p. 3: in a discussion of the Somowansjam [*somavamśa*], the name of a royal dynasty, Rogerius writes "inde gheseyde Tale beteyckent Somo de Maen". Rogerius' work was translated into English, German and French and remained for more than a century an important source of knowledge on India and Indian religion.

A valuable discussion of early ideas, guesses and philological research on Soma is found in Doniger O'Flaherty 1969, where the reader will find references to a few additional contributions left out by me as they seemed less significant or influential. On the other hand, I mention here a few authors skipped or overlooked by Doniger O'Flaherty, or not available to her.

[6] Anquetil-Duperron 1771, vol. 2, p. 535. The classics are Anquetil-Duperron's frame of reference when he associates the Parsis' Hom (Haoma) with the *ám mos* of the Greek and the *amomum* of the Romans.

[7] Wilkins 1785, in note 42 (p. 143) to the verse in "Lecture IX" of the Bhagavadgītā in which reference is made to "followers of the three V ds, who drink of the juice of the S m" (*traīvidyā[h]* ... *somapāh*), observes that "S m is the name of a creeper, the juice of which is commanded to be drunk at the conclusion of a sacrifice, by the person for whom and at whose expense it is performed, and by the Br hm ns who officiate at the altar."

[8] When Hillebrandt (1927: 201) writes that Mukherjee rejects the identification of Soma and Cannabis (Bhang), he seems to have misunderstood Mukherjee's rhetorical question (1921: 244) "From what has been stated above, may we not conclude that the weight of evidence is in favor of the identification of Soma with Cannabis (Bhâng)." Mukherjee's view appears in more detail in a paper that appeared in 1922 (the 9-page booklet present in the Leiden University library is perhaps an offprint of the paper Mukherjee announces at the end of his 1921 article as appearing in the *Bulletin of the Indian Rationalistic Society of Calcutta*; the name of this journal is, however, nowhere mentioned in the paper).

[9] Aitchison (1888: 87) also discusses the *Periploca aphylla* (like the *Sarcostemma* belonging to the *Asclepiadaceae*) which he found in northern Baluchistan. He notices the native names "Um, Uma; Punjabi Batta." J.G. Baker suggested it as a candidate for Soma in a letter to the Academy in 1884.

[10] See Madaus 1938: 1261.

[11] Madaus 1938: 1264.

[12] Lewin thus passes over – is probably unaware of – the fact that neither the Vedic nor the Iranian ritual have any place for a process of distillation which would be required to achieve a drink deserving to be called "strong alcoholic".

[13] In his *Brave New World Revisited* (1959: 99-100) Huxley states in retrospect: "The Soma of Brave New World had none of the drawbacks of its Indian original. In small doses it brought a sense of bliss, in larger doses it made you see visions and, if you took three tablets, you would sink in a few minutes into refreshing sleep."

[14] Two papers appearing in a recent volume on Aldous Huxley (Barfoot 2001) are of considerable, direct importance for the Soma-problem: Albrecht Wezler's confrontation of Huxley's ideas on 'psychedelic' drugs in India with presently available data and theories on the use of drugs, especially Soma, and, from quite different contexts, Bhang (Cannabis), as means to mystical experience; and Wilhelm Halbfass' profound analysis of philosophical problems related to drug-induced mystical experiences according to Huxley and in Indian philosophy. Relevant for, though not directly dealing with, the *interpretation* of the Soma-experience by Huxley is Johannes Bronkhorst's discussion of Huxley's theory of a *philosophia perennis* consisting of features which all or most religions would share.

[15] The book is also often referred to as appearing in 1968. In the copy in the library of the Kern Institute I searched in vain for the publication date. In Richard Evans Schultes' foreword in Wasson 1972a we read that "Mr. R. Gordon Wasson" brought out his *SOMA Divine Mushroom of Immortality* on April 15, 1969. But in 1986 Wasson writes (p. 26): "At the end of 1968 or the beginning of 1969 our *SOMA* finally appeared ... " I will stick here to 1969 as its publication date.

[16] J. Brough (1971: 332 note 1) notes that "Mr. Wasson ... was for 10 years a Research Fellow of the Botanical Museum of Harvard University, now Honorary Research Fellow; also Honorary Research Associate and former member of the Board of Managers of the New York Botanical Garden."

[17] Huxley and Wasson knew each other quite well. Cf. Wasson in an autobiographical passage, 1969: 175: "I do not recall when the Soma possibility first drew my attention ... From 1955 on I was in intermittent correspondence with Aldous Huxley, and often when he visited New York he would come down to Wall Street and have lunch with me." And cf. Huxley, in a letter to a friend written in 1957 (in Huxley 1977: 132): "While I was in New York, I lunched with Wasson [. . .] [H]e has put an immense amount of work into his subject, and the material brought together in his vast tomes is very curious and suggestive. However, he does, as you say, like to think that his mushrooms are somehow unique and infinitely superior to everything else. I tried to disabuse him. But he likes to feel that he has got hold of the One and Only psychedelic – accept no substitutes, none genuine unless sold with the signature of the inventor."

[18] Similarly, Kuiper 1970: 282: "Generally speaking, his [Wasson's] interesting attempt to interpret the Vedic evidence in the light of his novel theory encounters difficulties when the separate passages are considered in the context of Vedic mythological and ritualistic thought." Kuiper illustrates the point with Wasson's interpretation of Ṛgveda 9.86.44c (Wasson 1969: 41) and of Ṛgveda 9.97.9d (Wasson 1969, plate VIII a and b). Brough discusses Wasson's interpretations of 9.97.9d, 9.71.2d, 9.70.7d, 9.75.2 and of notions recurring in Ṛgveda-translations such as "the udder and Soma", "Soma's 'head'", "the single eye", "mainstay of the sky", "the filter", and the Vedic *sah/asrabhr̥ṣṭi*.

[19] A list of "principal reviews" of Wasson 1969 appears at the end of Wasson 1972a.

[20] Wasson goes so far as to indulge in near-abusive rhetorics on the reviewers who do not accept his hypothesis. Thus, in 1972a he writes: "These two statements, Brough's and Kuiper's, reveal the absurd isolation in which some Vedic scholars live by choice." Before embarking on his investigation of the points presented by Wasson, Brough (1971: 331) discusses the state of the art in the Soma-Haoma discussion before Wasson 1969 and observes " ... and the opinion is widely held that the problem is insoluble." In almost paranoiac fashion Wasson (1972a: 10) perceives here a conspiracy of "Brough and other Vedic scholars" to be satisfied with the "anonymity of Soma" as "a built-in element in Vedic studies" and to want to keep it like that. As for the statement of Kuiper that enraged Wasson, it is: "This means that the search for 'the original Soma' might lead us far beyond the field of Indo-Iranian studies proper" (Kuiper 1970: 284). As linguist and as mythologist of the Indian area and of Indo-European cultures, Kuiper himself is habituated to "go beyond the field of Indo-Iranian studies proper". Immediately preceding this statement Kuiper is discussing aspects of Nordic myths relevant to the Soma-issue. The implication which Wasson connects with this statement is hence preposterous: " ... as though such excursions were dangerous temptations to be avoided." Apparently in a more balanced state of mind and with a strong sense of the importance of his own researches he writes elsewhere in a recapitulation of his argument for non-indologists (1972b: 208): "Professor F.B.J. Kuiper of Leiden is a thousand times right in saying that 'the complexities of the problem should not ... be underestimated.' He adds that the identification of Soma must take the seeker far beyond the confines of Indo-Iranian studies proper. This is where I have gone." It is in any case ironic that Kuiper's review which infuriated Wasson in 1972a was read as an acceptance of Wasson's thesis as probable by Frits Staal in 1983, I: 106. Kuiper does conclude his discussion on a non-committal but quite positive tone when he writes: "Wasson, with his unique knowledge of the use of hallucinogens in Eurasia, may be perfectly right in assuming that the original Soma plant was the *Amanita muscaria*, but to prove this the evidence of the Rigveda would seem to lack decisive force."

[21] While Kashikar 1990 does more justice to the important and extensive branch of literature of this period, a comprehensive overview and study of relevant passages is still a desideratum.

[22] Wasson's enthusiastic presentation on the use of the fly-agaric with a view to identify them with the Vedic Soma may have to be amended in some respects. Cf. the conclusion of Nyberg 1995: 392-393 on *Amanita muscaria* as a candidate for Soma, especially his third point: "In my opinion, *Amanita muscaria* is unsuitable for any identification with *soma/haoma* on the following grounds: 1) The mushroom produces visions, sleep and/or a peaceful state of intoxication; the duration of effects is short; 2) *soma/haoma* is prepared from stems or stalks, which most probably should be regarded as fibrous (Brough 1971; Falk 1989) while the fleshy stems of *A. muscaria* contain only very small amounts of the pharmacologically active compounds, which are concentrated instead in the mushroom cap (these are the only parts of the mushroom used in northern Siberia); 3) culturally, the use of *A. muscaria* occurs only among the shamanistic peoples of northern Eurasia and it is neither a required part of any shamanistic rite, nor regarded as holy in them. On the contrary, only the 'weak' shaman or a 'recreational user' has to resort to the use of the mushroom (Eliade 1964: 210; Saar 1991); 4) the mushroom must have been rare in any of the proposed Indo-Iranian homelands. In contrast, when the use of *soma/haoma* began, the Aryans seem to have been inhabiting a region where the to-date unidentified plant was abundant."

[23] See especially Wasson 1969, Part One, chapter IV: "Soma Was Not Alcoholic".

[24] In his 1969 book Wasson's strategy is to distinguish between the Ṛgveda and later texts, and between a later part of the Ṛgveda and an earlier one (the latter comprises the ninth or Soma-Maṇḍala). In his answers to Brough, however, he suggests (1972a: 14) that the crucial episode of the pressing of the Soma-plants with stones or pestles is adventitious, even if references to the pounding and the pressing stones and pestles occur dispersed throughout the different sections of the Ṛgveda, including those which Wasson uses for his positive identifications.

[25] Stuhmann 1985: 91 quotes here Oldenberg's expression (1894: 182) "formloses Gewirr von Bildern und mystischen Phantasmen".

[26] Falk extends his argument too far when he says (1989: 82) not only that Soma creates wakefulness, but also that it originally must have been offered to Indra during the night.

[27] Cf. Madaus 1938: 1263; on the modern use of stimulants in psychiatry with brief references to their history as well as to Ephedra: Fawcett and Busch 1998.

[28] Cf. the discussion of 3,4-Methylenedioxyamphetamine (MDMA) and its pharmacological properties by Shulgin and Nichols 1978. The authors are aware of its "occasional and erratic appearance in the illicit street drug market", but apparently not yet familiar with its later popular name Ecstasy or XTC. Briefly on the relation between chemical structure and psychopharmacological effects of MDMA and related compounds: Fawcett and Busch 1998: 505-506.

[29] Cf. note 36 below.

[30] Together with Asko Parpola, Kashikar published an overview of recent Śrauta traditions in India in Vol. 2 of Staal's *Agni*, and remarked (Kashikar and Parpola 1983: 248) that for the original Soma "[t]he most likely candidate seems to be some species of Ephedra."

[31] Doniger O'Flaherty's brief section on the Brāhmaṇas and Śrautasūtras in her discussion of the post-Vedic history of the Soma-plant, was therefore misleading in that she presented these texts as only speaking of substitutes whereas it is clear that their authors presuppose those who employ the texts to be well aware of the distinction between the real Soma-plant and its substitutes.

[32] A Maharashtrian sweet dish made out of beestings is reported to have a light yellowish color (Madhav Deshpande, Indology Discussion Archive 11-02-2003, and, off-list, Vishal Agrawal 12-02-2003, in response to a question I asked on the Indology list – 11-02-2003 <http://www.ucl.ac.uk/~ucgadkw/indology.html>).

[33] I thank the author for kindly sending me this paper on a subject about which we have discussed at a few occasions.

[34] In fact, this is a point in Staal's own argument 26 years earlier: Staal 1975, e.g. p. 195: "So far, the following causes may be assumed to be conducive to mystical experiences: birth, meditation, asceticism, drugs, mantras, yantras, special devices like *kaṣaṇa*, *rituals*, devotion to a deity" (my emphasis, J.H.).

[35] Cf. already Lewin 1927: 180 on the effect of alkaloids in Belladonna and Datura: "Ein Schneider, der unter den Einfluss von Belladonna und Datura gekommen war, zeigte die übliche Pupillenerweiterung neben Krämpfen. Nachdem diese nachgelassen hatten, setzte er sich im Bette so zurecht, als wäre er auf einem Schneidertisch, und manipulierte, als wenn er mit seiner Arbeit beschäftigt wäre, die Nadel oft einfädeln

müsste usw. Dabei hörte und sah er nicht. Das Bewusstsein fehlte. Dieser Zustand hielt fünfzehn Stunden an." Cf. also Fawcett and Busch 1998: 507: "In humans, both cocaine and amphetamine produce behaviors characterized by repetitious arrangement of objects. Such behaviors may be analogous to stereotyped behaviours induced by amphetamines in animals (K.S. Patrick et al. 1981)."

[36] See also the criticism on Flattery and Schwartz uttered by Nyberg 1995: 399: "To say that the effects of ephedras are "of insufficient intensity" or "too inconsistent in character" (in Flattery and Schwartz 1989: 72) seems to reflect a tendency to apply modern methods of clinical drug evaluation to an ancient culture having a very different psychological pattern and way of life when compared with modern Western culture."

[37] Lowie 1954: 157: "Woodland and Plains Indians deliberately went out to a lonely spot in order to obtain a revelation. ... the normal procedure was to go into solitude, fast and thirst for four days, and supplicate the spirits to take pity on the sufferer." Blackfoot specialist L.M. Zuyderhout kindly drew my attention to the sections on visions and shamans in Lowie 1954, and informed me (email 27.01.2003) on the basis of her extensive fieldwork that also women may go on a vision quest and fast and thirst although there are hardly published sources on this. In addition, women had to fast in connection with the Blackfoot Sun Dance.

[38] Soma is connected with poetic inspiration and with dh/I or 'vision' (cf. Gonda 1963: 41, 51, 69, 73ff), but generally these cannot be regarded as "hallucinations"; browsing through Geldner's Register to his Ṛgveda translation, we find listed as the effects of Soma (Geldner 1957: 248-249) that it incites thought (1.129.6 *mánma réjati*, 6.47.3 *manīṣám ... ajīgaḥ*), it is able to engender poetical thought (9.95.1 *matīr janayata*), is the progenitor of poetical thoughts (9.96.5 *janitā matīnām*), opens the doors to the thoughts (1.46.5 *ādāró vāṁ matīnām*, 9.10.6 *ápa dvārā matīnām ... ṛṇvanti [sómāsaḥ]*).

[39] Cf. in Geldner's Register to his Ṛgveda translation, among the effects of Soma (Geldner 1957: 248-249): Soma keeps awake (8.2.12 *jarante*, said of the Soma juices; 3.37.8 *jāgrvi* said of the Soma); it gives strength (9.90.2 *vayodhā*). Apart from this useful but quite incomplete thematic index cf. also statements such as 9.1.10ab *asyéd índro mádeṣv ā vísvā vṛtrāṇi jighnate* "In the exhilarations of this (Soma), Indra destroys

all obstructions and obstructors"; 9.113.1 *śaryaṇāvati sómam índraḥ pibatu vṛtrahá bálam dádhāna ātmáni kariṣyān vīryāṁ mahád* "At the Śaryaṇavat (lake), Indra the Vṛtra-killer must drink the Soma, putting strength in himself, about to perform a great heroic feat."

[40] Cf. from Fischman's (1987: 1544) summary of the general effects of stimulants, in this case specifically cocaine and amphetamines –note their correlation with stereotyped behaviour (ritualization), my emphasis:

"Humans given single moderate doses of cocaine and amphetamine generally show a decrease in food intake and fatigue and an increase in activity, talkativeness, and reports of euphoria and general well-being. At higher doses *repetitive motor activity (stereotyped behaviour)* is often seen, and with further increases in dose, convulsions, hyperthermia, coma, and death ensue.

...

The effects of cocaine and amphetamine in most non-human species parallel those seen in humans. At lower doses, animals are active and alert, showing increases in responding maintained by other reinforcers but often decreasing food intake. Higher doses produce species-specific *stereotyped behavior patterns*, and further increases in dose are followed, as in humans, by convulsions, hyperthermia, coma, and death."

[41] The case for a more subtle psychoactive substance as candidate for Soma and Haoma can be supported by contrasting the modern, "secular" use of tobacco in recreational smoking, with its use among the South-American Warao when communicating with the supernatural (Wilbert 1972). What is experienced as a light relaxing influence in modern society was associated with communication with a different world among the Warao. Wilbert 1972: 55: "Even if it is not one of the 'true' hallucinogens from the botanist's or pharmacologist's point of view, tobacco is often conceptually and functionally indistinguishable from them." As for the Soma and the Soma ritual, with a more subtle psychoactive substance as candidate for Soma it will be easier to explain the gradual, noiseless disappearance of "the real Soma" in the ceremony devoted to its celebration (imagine a marriage where no-one notices that the bridegroom has silently disappeared ...), after an intermediate phase in which substitutes were occasionally permitted.

[42] On problems regarding Stein's finds in the 1930's cf. Flattery and Schwartz 1989: 73 note 6; and on problems in connection with Ephedra

in the Bactria-Margiana archeological complex cf. Bakels in the present issue. While the references by Mallory & Mair are frequent but marginal, Barber's discussion (1999, chapter 8) of the Ephedra found with the mummies is more elaborate, takes notice of the re-identification of some samples of mummy-Ephedra as Equisetum, and forms part of an argument for the ethnic identification of the mummies. Just as Mallory & Mair she takes Sarianidi's conclusions regarding the use of Ephedra in Margiana for granted – Bakels' contribution shows that such easy acceptance is unwarranted.

[43] Cf. Wasson in Wasson et al. 1986: p. 36-37: "Some of us formed a committee under the Chairmanship of Carl Ruck to devise a new word for the potions that held Antiquity in awe. After trying out a number of words he came up with *entheogen*, 'god generated within', which his committee unanimously adopted, not to replace the 'Mystery' of the ancients, but to designate those plant substances that were and are at the very core of the Mysteries." Unlike Wasson I see no reason to restrict the term to substances currently labeled as hallucinogens, but I would include psychostimulants, as well as alcohol and hashish which Wasson wants to exclude on account of their use as recreational drugs (he forgets that they have been and often still are used as instruments in mystical quests, cf. Wezler 2001, whereas, on the other hand, his fly-agaric is also in use as recreational drug, cf. Nyberg 1995: 392-393 quoted in note 22), and tobacco (cf. previous note).

[44] With regard to K.C. Forman's question (1990: 5): "Are there some experiences, or some specifiable aspects of human experience, that are not 'constructed' by our language and belief?" the answer suggested by cross-cultural experience with psychoactive substances from tobacco and alcohol to CNS-stimulants and hallucinogens would seem to be that only very general aspects of the experience (e.g., euphoria, hallucination, synesthesia) have a stable correlation with specific substances, whereas the actual "contents" of the experience are entirely constructed. An analysis of the category of "experience" in the encounter between India and the West was given by Wilhelm Halbfass in 1988: 378-402. With regard to Huxley's interpretation of Indian traditions Halbfass points out (2001: 233) that "'Experience' is the common denominator in Huxley's fascination with drugs and his interest in Indian philosophy"; he observes that it is, however, only in Neo-Vedantic thought that experience, rather than traditional authority, starts to play the decisive role accepted by Huxley. When Bronkhorst (2001) attempts to find shared features in the

religions adduced by Huxley to establish his "perennial philosophy" it is significant that it is precisely the category of "experience" that he leaves out.

[45] According to Lehmann, the Soma of the Ṛgveda was pressed not from a green plant or from a mushroom but from honeycombs, especially from those of the Indian giant or rock bee. The significant difference with Oldenberg's honey-theory is that the latter saw evidence that already in proto-Indo-Iranian times the honey was replaced by a plant (to whose sap honey was added in the ritual!). Lehmann does not address the question why the knowledge of Soma as honeycomb and the techniques to press the honey out of them would have got lost over the centuries whereas honey itself remained a familiar product. As a bee from flower to flower, Lehmann (2000: 195: "Mir fehlen Kenntnisse des Sanskrit") jumps from the one to the other far-fetched text-interpretation that he deems "possible", and happily concludes his paper with the statement that the Soma-problem is now solved. Still of interest is the attention he pays to the story of the monkeys in the Madhuvana (Rāmāyaṇa 5.59-61), and the state of *mada* they attain when consuming the available honey. It is possibly the earliest extensive literary description in the Sanskrit tradition of a *mada* in all its shades from happy exhilaration to aggressive behaviour towards the guards of the "honey grove".