

SOMA AND AMANITA MUSCARIA

By JOHN BROUGH

The importance of the Soma-plant in Vedic religion has never been underestimated. Among the rituals of the Yajurvedic texts, the *soma*-sacrifices are among the most elaborate and important, and are described in minute detail in the *Brāhmaṇas* and *Śrauta-sūtras*. These later texts nevertheless continue a direct tradition from the *Rgveda*, which can be seen to reflect an earlier stage in the development of the ritual, doubtless of a less rigidly formalized and probably less elaborate nature. Even so, the *Rgveda* is, so to speak, permeated by Soma. Understandably, therefore, from the early days of Vedic studies in the West, many scholars have speculated on the botanical identity of the plant in question. Numerous candidates have been nominated, the most frequently favoured being species of the genera *Ephedra*, *Sarcostemma*, *Periploca*, and latterly *Cannabis*, and even *Rheum*. Not a single one of these conjectures has gained general assent, and the opinion is widely held that the problem is insoluble.

Earlier, *soma* was usually thought to be a fermented drink ; but the facts of the ritual exclude this, and most scholars would now reject the alcoholic theory. It is then easier to understand the sharp contrast between the divine *soma* and the presumably fermented *surā*. The latter drink is frequently mentioned with disapproval in the later Vedic texts : for detailed references, see P. V. Kane, *History of dharmaśāstra*, II, 792 ff. It is fair to add that *surā* seldom occurs in the RV, and in this earlier period only its excessive consumption seems to be considered bad. The use of *surā* in the Sautrāmaṇī, and in conjunction with *soma* in the Vājapeya, is thus not necessarily paradoxical.

The situation is comparable in the Avesta : *Yašt* 17.5 (and similarly *Yasna* 10.8) *nəmō haomāi yaθ vīspe anye maδānō aēšma hačinte xrvīdvrō, āaθ hō yō haomahe maδō aša hačaitē xʼaēpaiθē* ‘Homage to Haoma, in that all other intoxications are accompanied by Frenzied Wrath with bloody club, while that intoxication which is Haoma’s is accompanied by his own *Aša*’. By implication, this would include *hurā* among the other ‘bad’ drinks ; but specific references to *hurā* in the Avesta are regularly neutral, and it is mentioned merely as a drink, without condemnation. Similarly in Middle Iranian, Pahlavi *hvr*, a drink for kings and nobles : see W. B. Henning, *BSOAS*, xvii, 3, 1955, 603.

In RV 7.86.6 *surā* is one of several causes of sin against Varuṇa ; it is linked with *soma* in 8.2.12, perhaps implying that the two drinks had some effects in common : *hr̥tsú pītāso yudhyante durmādāso ná sūrāyām* ‘When consumed, they (the *somas*) fight in the heart (of Indra?) like men badly inebriated on *surā*’ ; while the gift from the Aśvins to Kakṣivant of a hundred jars of *surā* is obviously a splendid blessing in 1.116.7 *kakṣivāte . . . śatām kumbhām asiṇcatam sūrāyāḥ* ; and this is obviously the same blessing or a closely similar one accorded to the tribe (*jānāya*) of Kakṣivant by the Aśvins in the next hymn, 1.117.6 *śatām kumbhām asiṇcatam mādḥnām*—‘of intoxicating drinks’ rather

than ' of honey '. It will be convenient to postpone discussion of this last point until later in this article.

It is thus natural, in the quest for the nature of *soma*, to turn to the consideration of a vegetable alkaloid or similar substance.

Discussion of the identity of the Soma-plant has latterly been in the doldrums. It is therefore greatly to the credit of Mr. R. Gordon Wasson that he has re-awakened interest in the problem by the publication of a detailed and scholarly investigation, propounding the revolutionary theory that the Soma of the *R̥gveda* was a mushroom.¹

' My candidate for the identity of Soma is *Amanita muscaria* (Fr. ex L.) Quél., in English the fly-agaric, the *Fliegenpilz* of the Germans, the *mukhomor* of the Russians, the *fausse oronge* or *tue-mouche* or *crapaudin* of the French, the brilliant red mushroom with white spots familiar in forests and folklore throughout northern Eurasia.

' This is the first time that a mushroom has been proposed in the Soma quest.

' The fly-agaric is an inebriant but not alcoholic. As far back as our records go, it has been the Sacred Element in the shamanic rites of many tribes of northern Siberia, tribes that are concentrated in the valleys of the Ob and the Yenisei, and then, after an interruption, other tribes in the extreme northeast of Siberia ' (p. 10).²

In summary, Wasson considers that the Soma-cult is explicable as an Indo-Iranian representative of a fly-agaric cult which in early times was wide-spread throughout a great part of Eurasia : ' How astonishing that we can still draw parallels with the fly-agaric cult in Siberia, where as we shall see in *Part Three* it lingers on, in the last stages of degeneration among the peripheral tribes of the extreme north ' (p. 68). He therefore devotes a major part of his book to the discussion of the use of the fly-agaric and other mushrooms in lands beyond India and Iran, and especially in Siberia. These sections of the book are full of interest as an aspect of cultural history ; but as a matter of simple logic, such parallels have no probative value. They cannot even be adduced as confirmatory arguments for the theory that the Soma-plant was *A. muscaria*. Until this theory is proved for the *R̥gveda*, and proved beyond any possible

¹ R. Gordon Wasson, *Soma, divine mushroom of immortality*. (Ethno-mycological Studies, No. 1.) xiii, 381 pp., 24 plates, 3 maps. The Hague : Mouton ; New York : Harcourt, Brace and World, Inc., [c1968] (publ. 1969), \$200 (£86.50). The book is sumptuously produced, printed on hand-made paper specially water-marked, with 24 colour plates. Edition limited to 680 numbered copies. Mr. Wasson's primary study is mycology, and he 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. In my discussion of the theory here, I am much indebted to Professor Mary Boyce and Dr. I. Gershevitch for information and advice on some of the relevant Iranian materials. These colleagues are of course not necessarily committed to any of the views which I have expressed ; and any inadvertent errors are my own.

² Throughout the present article, such references, unless otherwise indicated, are to pages or plates of Wasson's book.

doubt, the non-Indo-Iranian materials remain, in the strictest sense, irrelevant. Even if the proposed identification for Soma seems probable, but is not proved on the basis of internal evidence, extraneous facts are not additional evidence. On the other hand, if the Vedic case were proved, we should indeed begin to consider the possibility of a very wide-spread and significant cultural religious continuum.

The present article is therefore mainly concerned with the first section of Wasson's book, namely, that which gives his detailed arguments from the text of the *R̥gveda* itself. Because the book is costly, and the edition limited, it may be useful to readers to prefix a summary of the contents of the remainder of the book.

The main argument is presented in pp. 3-70, where are included many splendid colour photographs of *A. muscaria* to illustrate aspects of the plant which, as Wasson believes, inspired the epithets and tropes applied to Soma by the poets of the *R̥gveda*. He excludes later texts, on the grounds that the original plant had already been replaced by substitutes, and was possibly in process of being lost even by the time of the later hymns of the RV : 10.85.3 *sómaṃ yám brahmāṇo vidúr ná tásyāśnāti káś caná* 'The Soma that the Brahmans know—that no one drinks' (quoted and translated, p. 14). The remainder of part I consists of 'Mani, mushroom, and urine' (ch. xii, pp. 71-6); and 'The marvelous herb' (ch. xiii, pp. 77-92)—a brief passage from the *Shāhnāma*, another from the *Padma Purāṇa*, and a longish discussion on the famous *ling chih* 靈芝 of the Chinese, recognized to be a different mushroom, at least in part mythical, but believed by Wasson possibly to have been inspired in part by tales of a mushroom cult brought to China by way of Central Asia.

Part II, 'The post-Vedic history of the Soma plant' (pp. 95-147), is contributed by Dr. Wendy Doniger O'Flaherty. This is a useful essay which starts by bringing together statements about Soma in the *Brāhmaṇas*, *Śrautasūtras*, and later Sanskrit works, including prescriptions of possible substitutes for the Soma-plant when the latter is not available. The substitutes, as would be expected, are only Sanskrit names to us, and few if any can be identified botanically. There follows an interesting section giving a history of the controversies on Soma in the nineteenth and twentieth centuries; and it is instructive to observe not only the multifarious plants proposed, but also the quite superficial approach of the majority of the writers on the subject.

On p. 97, 'the *nyagrodha* (sacred fig or banyan tree)', and p. 122, 'the *nyagrodha* (*Ficus religiosa*)', is a mistake. The *nyagrodha*, *vata*, the banyan, is *Ficus benghalensis* L. (given in the Sanskrit dictionaries as *F. indica* L., a discarded name for the same plant: it is now an error to use '*F. indica*'). *F. religiosa* L. is the *aśvattha*, *pippala*.³ This may be an isolated lapsus; but it suggests that the numerous botanical names and 'synonyms' given in this chapter

³ The Sanskrit dictionaries are notoriously unreliable on botanical nomenclature. Among the most frequently mentioned figs in Sanskrit, only *Ficus religiosa* = *aśvattha* still stands as a valid name, while others continue to be miscalled by names now discarded by botanists under the

may sometimes require further taxonomic research before they may be safely quoted.

In part III, 'Northern Eurasia and the fly-agaric' (pp. 151-204, followed by an epilogue on 'The tree of life and the marvelous herb', to p. 222), Wasson resumes the tale. In the concluding section of the book, entitled 'Exhibits' (pp. 233-356), extracts are quoted in English (translated from other languages as needed) of passages relevant to the fly-agaric from the writings of explorers, travellers, and anthropologists. The earliest of these passages is from 1658, but the majority are much more recent. Annotations are added where necessary, and Wasson is careful to indicate points where the witnesses are unreliable. Most of the 'Exhibits' concern Siberia; but in dealing with the last few, on Scandinavia, Wasson rejects the theory that the old Norsemen went 'berserk' through consuming the fly-agaric. This would have been a good parallel to the stimulation for battle which Indra obtained from *soma*. But the Norse tale of the fly-agaric in this connexion first appears in the late eighteenth century, and is thus without value.

As already indicated, Wasson's arguments directly drawn from the RV are contained in the first part of the book, the detailed evidence being concentrated in less than one-fifth of the volume. To these arguments we now turn our attention.

It must be emphasized that Wasson did not deliberately set himself to identify the Vedic Soma. In an earlier book⁴ he and his wife 'explored the folkloric and linguistic background of the fly-agaric throughout Europe, and showed the deep hold that it exerted at one time on the imagination of the north European peoples' (p. 35). It was only much later that he became acquainted with the RV, through the translations of Geldner, Renou, and Bhawe,⁵ and gradually came to the conviction that 'the hymns of the R̥gVeda fit the fly-agaric like a glove. True, one must possess some awareness of the psychotropic

priority rule. The opportunity is taken here to correct some of these: for further details, see E. J. H. Corner, 'Check-list of *Ficus* in Asia and Australasia', *The Gardens' Bulletin* (Singapore), xxi, 1965-6 (publ. 1967).

udumbara: *F. racemosa* L. [wrongly *F. glomerata* Roxb.]

udumbarī, añjira (Pers. انجیر): *F. hispida* Linn. f. [wrongly *F. oppositifolia* Roxb.]

parkaṭī: either *F. virens* Ait. [wrongly *F. infectoria* Miq.]

or *F. tsjahela* Burm. f. [wrongly *F. infectoria* Willd.]

or *F. caulocarpa* Miq. [wrongly *F. infectoria* Willd. var. *caulocarpa* (Miq.) King].

This last is a good example of the confusion which can arise when, as is usual in Sanskrit dictionaries, the naming authority is omitted: s.v. *parkaṭī* we find only *F. infectoria*, and are thus left with three possible interpretations.

⁴ R. G. Wasson and V. P. Wasson, *Mushrooms, Russia and history*, New York, 1957.

⁵ Karl Friedrich Geldner, *Der R̥g-veda aus dem Sanskrit ins Deutsche übersetzt* (Harvard Oriental Series, xxxiii-xxxv), Cambridge, Mass., 1951; Louis Renou, *Études védiques et pāṇinées* [EVP], especially Tomes viii and ix, Paris, 1961 (translation with notes of the ninth *mandala*, to Soma Pavamāna); S. S. Bhawe, *The Soma-hymns of the R̥gveda*, Baroda, 1957, 1960, 1962 (containing 9.1-70).

plants of the world and their rôle in primitive religion. Given that familiarity, a reading of Geldner, Renou, and Bhawe leads straight to the fly-agaric ' (p. 67).

The argument depends chiefly on the assumption that many of the descriptive phrases applied to Soma in the RV are direct descriptions of the growing mushroom, or poetical figures suggested by it at various stages in its development. Much persuasiveness is added by the brilliant colour plates ; and since these cannot be reproduced here, Wasson's own account of *Amanita muscaria* (p. 35) is quoted as an aid to clarification.

' In the fall of the year, hard by a birch or pine, one is apt to find the fly-agaric. The season in the temperate zone lasts two or at most three weeks, with the climax coming in the middle week. The fly-agaric emerges like a little white ball, like cotton wool. It swells rapidly and bursts its white garment, the fragments of the envelope remaining as patches on the brilliant red skin underneath. At first the patches almost cover the skin, but as the cap expands they are reduced in relative size and finally are nothing more than islands on the surface. In fact, under certain conditions, especially as a result of rain, they are washed off altogether and the fly-agaric then shines without blemish as a resplendent scarlet mushroom. When the plant is gathered it soon loses its lustre and takes on a rather dull chestnut hue.'

It is to this plant in its various stages that, in Wasson's opinion, the hymns of the RV refer, in the epithets and tropes which they apply to Soma. ' It is certain that the poets of the RgVeda knew the original Soma at first hand, and they never strayed from it for long ' (p. 12). But is it certain? It is difficult to imagine that the ritual utterances of the ceremonies of Soma Pavamāna (the examples are naturally taken mainly from the ninth *maṇḍala*) should be dominated by rapturous descriptions of *A. muscaria*, a plant which can be seen in its beauty during only a few days of the year. The dull, dried specimens which must have been used at almost every sacrifice—and invariably after the Vedic people had reached the plains of northern India—could hardly have inspired poetic rapture. At the pressing and clarifying, the priests are intent on the ritual situation ; and it is far more likely that the rapture is to be attributed to the remembered and anticipated psychotropic effects of the *soma*-juice. Granted that, unlike *soma*, opium is not sacrosanct, it is scarcely likely that a user of opium would rhapsodize over the beauty of the flower of *Papaver somniferum*.

This comparison may perhaps seem a little unfair, when the priests were preparing the drug from actual plant material during the rite. Still, the accompanying hymns are essentially ritual utterances. We cannot deny the possibility that the hymns could reflect at least some features of the wild plant ; but in the context of the ritual pressing and filtering of the *soma*-juice, it seems hazardous to conjecture that such reminiscences could have been so omnipresent as Wasson would have us believe. It is a delicate task to interpret passages from hymns which can involve the plant, or the pressed juice, or the deification of the latter, the god Soma. The poets draw no sharp distinctions

between these three. Even if the deified Soma may still show some characteristics based on the natural plant, mythological accretions are expected, and frequent. Often, details of the ritual acts, the divine Soma, and the physically present *soma*-juice so interact in the minds of the priests that an attempt to analyse these aspects could only distort the hieratic purport of the poets.

Wasson is not unaware of this, although in my opinion his arguments give undue prominence to his fugitive natural plant. 'Soma was at the same time a god, a plant, and the juice of that plant' (p. 3). This statement requires modification. No one has doubted that *soma*, in fact as well as by etymology, is the pressed juice, and that it is this juice which is the original 'place of manifestation' (*dhāman*, on which see below) of the deity Soma. So far as it is possible to be definite in such matters, the word *soma* seems never to be used directly as the name of the plant, unless perhaps occasionally as a metonymy (and even then the reference may be to the indwelling deity). One verse shows that this was clear to the Vedic poets :

RV 9.92.2 *āchā nṛcāksā asarat pavitre*
 nāma dādhanah kavir asya yonau :

'(Soma) . . . flowed hither, taking to himself his name on the filter, on his *yonī*'.⁶ When Soma is said to be located on the mountains, it seems almost certain that the sense intended is that the deity Soma is present in the sap of the plant. It is therefore probably going too far to say that 'Soma is the only plant that man has ever deified'. Rather, the situation is comparable to that quoted (p. 3) for the Mexican Indians, who 'seem to regard the hallucinogenic plants, whether mushrooms, *peyotl*, or morning glories, as mediators with god, not as a god'.

We thus have the peculiarity that a plant of unique importance in Indo-Iranian religion seems never to be named. Since the whole of the Veda was a secret text guarded by the priests, there is no reason to suppose that a taboo was responsible for this.

In the RV, references to the *amśu-* of Soma are frequent, the word being traditionally rendered as 'stalk' or 'stem'. Renou, for example, has 'la tige' or 'la tige (de *soma*)'. There seems to be no reason or indication from the text itself for the choice of the stalk. Indeed, if Wasson were right, it would be all the more extraordinary that the cap of his mushroom, the cap which provides so many details for his argument, should be thus discarded when the plant comes to be pressed in the ritual. (Wasson admittedly identifies *mūrdhan*, *śiras* 'head', when used in connexion with Soma, with the cap of the mushroom (pp. 45-6); but this interpretation is unconvincing : see below.) In the numerous Siberian examples quoted in the 'Exhibits', the mushroom is apparently always consumed whole. For the RV, we might guess that the potent drug was concentrated in the stalk of the Vedic plant, or even that other parts were noxious. There are no grounds for believing that the Indo-Iranians were sufficiently skilled herbalists to have made such discoveries.

⁶ For *nṛcāksāh*, Renou, ' (le *soma*) au regard de maître ' ; Geldner, ' Der männlich Blickende '.

On reading through the Soma-hymns, the recurrence of *amśu* is striking. One gradually comes to suspect that the word does not mean 'stalk', and the conviction begins to grow that we have here the actual name of the plant itself.

In seeking to verify this suspicion, a belated reference to Grassmann's dictionary showed that this idea was not new.⁷ Under the word, Grassmann gives: 'Name der Pflanze, aus welcher der Soma gepresst wurde. . . . Also: 1) Somapflanze, 2) der aus ihr gepresste Somasaft'. An examination of all the passages in the RV where the word occurs confirmed that in every relevant⁸ instance, Grassmann's interpretation did no violence to the sense, but on the contrary usually fitted more naturally in the verses in question. In 1.46.10 *ābhūd u bhā u amśave*, Geldner actually translates 'Licht ist der Somapflanze geworden'; Renou (*EVP*, xvi, 5) '... est apparue la lumière (adaptée) au soma'. Elsewhere, Geldner always gives 'Stengel' for *amśu*, with one exception, 9.15.5 *eśā . . . śubhrēbhir amśúbhiḥ* 'Dieser [Soma] . . . mit den . . . strahlenden Zweigen (Strahlen)', with the footnote '*amśúbhiḥ* dann doppel-sinnig'. Renou in a note on the same verse agrees that here '*amśu* a pour acception seconde "rayon"'. In spite of the occasional use of *śubhra* as an epithet of Soma (not explicitly of *amśu*), it seems risky, on the basis of this solitary verse, to read into the RV the common later Sanskrit sense of 'ray'.

It is slightly quaint to find both Roth and Renou⁹ mentioning *amśu* as the name of the plant, and immediately adding—almost as an afterthought—that, strictly speaking, the word meant the stem: 'Die dem Veda so geläufige Bezeichnung für die Somapflanze oder vielmehr ihre Glieder'; '*Amśu*-désigne, aussi bien dans le RV. que dans l'Avesta, le soma en tant que plante (et proprement la tige ou les fibres du soma)'.

Roth (loc. cit.), arguing in favour of a *Sarcostemma*, interpreted the *amśavaḥ* as the 'Stengelglieder', the internodes of the stems—rather too botanically precise in respect of a Vedic term. From the cylindrical shape of these he derived the sense of the fringes or tassels on a garment, which he considered was implicit in *amśupatta*. We cannot discuss in detail here the development of the post-Vedic meanings of *amśu*; but it is relevant to observe that at that time Renou (loc. cit.) excluded from the *mantras* the common classical sense of 'ray of light'. He added, however, 'Il est possible que cette nouvelle acception ait été déjà présente à l'auteur d'AV. XIII 2 7 qui nous dit du char solaire qu'il est *amśumánt*-: encore que Henry Hy. Rohitas p. 9 ait probablement raison de maintenir une version ritualisante "chargé de soma". . . . En tout cas la bifurcation de sens s'avère dans un autre passage de l'AV. VIII 1 2, où le poète réclame pour un malade l'assistance de soma *amśumánt*-: soit à la fois le soma avec les rameaux ou rejets de sa plante, et la lune avec ses rayons'. Possible,

⁷ This was a surprise, at least to me: having taken 'stalk' for granted, I had not previously thought to consult Grassmann for this word.

⁸ i.e., leaving out of account 8.5.26, where *Amśu* is a man's name, and 1.100.16, where *sumād-amśu* is unexplained, but appears to be part of a horse's harness.

⁹ R. Roth, 'Ueber den Soma', *ZDMG*, xxxv, 1881, 684; L. Renou, 'Les éléments védiques dans le sanskrit classique', *JA*, ccxxxi, juillet-sept. 1939, 341.

yes ; but still speculation for a period as early as the *Atharva-veda*. On the other hand, it is very likely that the meaning of 'ray' arose—whether in late Vedic or in post-Vedic Sanskrit—from the sun's being *aṃśumant-* 'possessing Soma-plants, the plants called *Aṃśu*', which would easily lead to a subsequent (mis)understanding as 'possessing rays'.

Like *aṃśu* in relation to Soma in the RV, the Avestan *qsu* is used only of Haoma ; and it would be worth investigating the possibility that here also *qsu* may be the name of the plant itself. (Bartholomae, *AIr. W.*, s.v. *qsav-* : 'Schoss, Zweig der *Haoma*-pflanze'.) In *Yasna* 10.2, for example, it seems possible to understand *qsuṣ* (Parsi Sanskrit version, *pallavān*) as 'the *Aṣu*-plants (belonging to the god Haoma)'. In *Yasna* 9.16 *haomō . . . nqmyqsuṣ*, the Pahlavi version *narm tāk* is followed by the Sanskrit rendering *mṛdu-pallavaḥ*, and by Bartholomae, 'mit biegsamen, zarten Schösslingen'.¹⁰ We might translate as 'Haoma . . . whose *Aṣu*-plants are tender (?)'.

Monier Williams's dictionary, s.v. *aṃśu*, has 'a filament, especially of the Soma plant'. It is amusing to imagine the process of pressing *soma*-juice from the filaments of plants. But the mistake is surely due only to a misunderstanding of the nuance intended by the Petersburg lexicon's 'Faser', which must be taken here as 'fibre'. This sense cannot be accepted for the RV ; but its genuineness in later Indo-Aryan is well attested : Bengali *āś* (Old Beng. *āsu*) 'fibre of tree or stringy fruit', and examples from other languages.¹¹ In Classical Sanskrit, a meaning such as 'fibre' can be seen in Sāyaṇa's comment on RV 10.17.12 *yás te drapsáh . . . yás te aṃśúḥ* : commentary, *drapsaḥ rasaḥ . . . yaś ca te tvadīyaḥ aṃśuḥ rasād itaraḥ san*, i.e., the *aṃśu* which is Soma's other part in contrast to the juice ; and similarly on verse 13 of the same hymn.

Although we reject 'fibre' as the precise sense of *aṃśu* in the RV, the later development of such a meaning strongly suggests that the Soma-plant was fibrous or stringy, rather than of the fleshy texture of a mushroom. I am indebted to my wife for the pertinent observation that, if the Soma-plant had been a mushroom, it would be strange that the elaborate Vedic process of pounding out and filtering the juice should have been necessary. Why should the plant not have been simply eaten? There is no particular sanctity in liquid as such : 'cakes' (*puroḍāś-*, *puroḍāśa-*) are among the sacrificial offerings most frequently mentioned in the ritual texts. Even although dried specimens of the mushroom may have been somewhat tough, even after soaking in water, nowhere in Wasson's 'Exhibits' is there any mention of the Siberian tribes pounding the fly-agaric to extract juice. On the contrary, in Siberia the plant is regularly eaten or swallowed whole, although occasionally it is used to make a decoction or infusion (pp. 234, 253, 260, etc.), or it is added to soups or sauces (p. 324). But RV 7.26.1 is explicit : *ná sóma índram ásuto mamāda nábrahmāno*

¹⁰ *AIr. W.*, s.v., analysing the compound as *nqmi-qsu-*. Some doubt may still be felt about the sense of **nāmi-*.

¹¹ See R. L. Turner, *Comparative dictionary of the Indo-Aryan languages*, s.v. *aṃśu-*.

maghāvānaṃ sutāsaḥ 'Soma unpressed has never intoxicated Indra, nor the pressed juices unaccompanied by sacred hymns'.

In Indo-Iranian terms, the god Soma acts through the juice to produce *mada*, *maḍa* 'inebriation, intoxication'. Such Western terms, however, have overtones which are out of tune with the reverential awe accorded to Soma. Geldner remarked in the introductory note to his translation of RV 9 (HOS, xxxv, 2), 'Die Wirkung des Somasafts wird im Veda wie im Avesta durch *mad* bezeichnet. Übersetzt man dies mit "berauschen", so ist das fast zu viel gesagt, mit "begeistern" zu wenig'. It is difficult to give an adequate equivalent, but the tenor of the hymns indicates something like 'possession by the divinity', in some way comparable to Greek ἡ ἐνθουσιασμός. One inspirational aspect of Soma is clear: more than any other god, he stimulates the poetic creation of the Vedic seers. All the words concerning poetic inspiration appear in connexion with Soma, such as *dhī*, *dhīti*, *mati*, *vip*-, *gir*-, *manīṣā*. The term *kavi* 'poet' is applied to men and to other gods, but very frequently to Soma, who is also *ṛṣi*, *vipra* (9.87.3): for Soma as *kavi*, see especially 9.96.17–18. In contrast to the wider application of *kavi*, it is noteworthy that the derivative *kāvya* 'poetic creation' (normally translated by Renou as 'pouvoir-poétique') is used preponderantly in connexion with Soma and Agni, with whom Soma is so closely associated in the RV. In 3.1.8 the two deities virtually coalesce: *ścótanti dhārā mādhuṇo ghr̥tāsya vṛṣā yātra vāvṛdhé kāvyaena*, Renou 'tombent-goutte-à-goutte les coulées du doux (*soma*), du beurre-fondu, là où le mâle (Agni) s'est invigoré grâce au pouvoir-poétique (des hommes)'; but perhaps rather, 'the streams of *madhu* (*soma*) drip, the streams of melted butter, where the Bull (Soma/Agni) has increased by means of his (Soma's) *kāvya*'. In 9.66.19–21, Agni is completely identified with Soma; in 9.96.18 *padaviḥ kavīnām* echoes the sense of 9.62.25 *vācō agriyāḥ*—Soma as 'leader of the Word'.

A *kāvya* is not merely an 'inspired utterance', but often a 'magically potent spell': in 4.35.4 the Ṛbhus divide the cup into four by their 'magic (creative) power', *kāvyaena*, and are invited in the same verse to press and drink *soma*. Similarly, the two Aśvins came to the aid of Indra by means of their magic skills, their wondrous powers: 10.131.5 ... *aśvinobhéndrāvāthukḥ kāvyaair daṃsānābhīḥ*. (See Geldner's note on the confused syntax of this verse. The general sense, however, is clear.) As a further development, elsewhere the plural *kāvyaṇi*, usually with the adjective *viśvāni*, appears to have acquired virtually the sense of '(all) things created (by the Word)'. For the recurring phrase *abhi viśvāni kāvya*, Renou has 'pour (atteindre) tous pouvoirs-poétiques' and similar renderings; but it may rather be taken as 'towards all created things'. See especially 9.70.2 and 9.107.23. A strong confirmation is provided by 8.41.5–6, where there is a parallel between the two verses: *yó dhartā bhūvanānām ... sā kavīḥ kāvya purú ... puṣyati* (Varuṇa) who is the supporter of the creatures (*bhūvanāni*) ... he, the *kavi*, nourishes the manifold creations (*kāvya*), and *yāsmīn viśvāni kāvya cakre nābhīr iva śritā* 'in whom all created things (*kāvya*) are held firm, as the nave is held in the wheel'. In a note

on this passage, Renou wrote of *kāvya* (*EVP*, VII, 30), 'Le mot englobe les arts poétiques, les créations cosmiques et tous savoirs secrets ; *kavi* est du point de vue véd. le créateur, le démiurge spirituel'. He nevertheless retained 'arts-poétiques' in his translation of the same passage. Closely similar is 9.94.3 *páři yát kavīh kāvīā bhárate . . . bhūvanāni víśvā* 'When the *kavi* (Soma) supports on all sides all created things (*kāvīā*), all creatures (*bhūvanāni*)'.

Such a development of sense would then be in the direct ancestry of the later philosophical concept of *śabda-brahman*. As early as 1955, Renou put forward a comparable proposal in the very first paragraph of *EVP*, I, 1 : 'Comme on l'a souvent constaté, sur un plan philosophique (ou pré-philosophique, si l'on préfère), un mot tel que *vāc* n'est autre que l'équivalent de logos : c'est le prototype de la notion d'*ātman-brāhman*, comme le dit G. [Geldner] ad 10.125, hymne adressé précisément à la Parole'. He refrained from making such a sense explicit in his translations of the hymns. Nevertheless, his note on 8.41.5 quoted above indicates that for himself it presumably remained an implicit understanding.

On a more mundane plane, the *soma*-drink was a powerful stimulant for those about to go into battle. In the hymns, it is drunk by the principal gods (9.90.5, and frequently) and above all by Indra, who thus prepares himself for his fights against the enemies of the Āryas and demonic foes, and particularly for his conquest of the demon Vṛtra in order to release the imprisoned waters. In the Avesta the epithet *varəθraǰā* 'victorious' is used of Haoma (*Yasna* 9.16), while in RV 8.24.6, 10.25.9 Soma is *vṛtrahantama-*, and *vṛtrahan-* in 1.91.5 etc., though in India the epithet is most frequently applied to Indra.¹² We may conjecture that the secular use of *soma* in battle came first in time, although its translation to the divine sphere must quickly have begun to develop in parallel. In the RV, *soma* is predominantly for the gods ; but even here it appears occasionally as a battle-stimulant for human beings : 9.30.3 *ā nah śúśman nṛśāhyam* 'Bring us warrior-might [exaltation of spirit as well as bodily strength] fit to subdue warriors' ; 9.85.2 *asmān samaryé pavamāna codaya . . . jahí śátrūn* 'O Pavamāna, stimulate us in the battle . . . strike down our enemies'.

There is regrettably little further information on the effects of *soma*. The only hymn which appears to give some details is RV 10.119, a soliloquy of one who has drunk the juice.¹³ If, as is usually held, the speaker is a deity or at least a mythological character, we must treat with circumspection any suggestion that this hymn is evidence for hallucinatory effects on human beings, and in any case make allowance for hyperbole. The hymn has often been quoted as

¹² See E. Benveniste and L. Renou, *Vṛtra et Vṛtragna* (Cahiers de la Société Asiatique, III), Paris, 1934 ; I. Gershevitch, *The Avestan hymn to Mithra*, Cambridge, 1959, p. 158.

¹³ Ancient tradition is unreliable on the myth or ritual for which this hymn was composed, although some connexion with Indra is recognized : for details, see Geldner's introductory note to his translation of the hymn. Modern scholars have tended to identify the speaker as Indra. R. Hauschild argued in favour of Agni : 'Das Selbstlob (*ātmastuti*) des Somaberauschten Gottes Agni (Rgveda x, 119)', in J. Schubert and U. Schneider (ed.), *Asiatica: Festschrift Friedrich Weller*, Leipzig, 1954, 247-88, a view which Renou considered probable (*EVP*, XIV, 39).

evidence that a *soma*-drinker experienced a great expansion in size : verse 12 *ahám asmi mahāmaho 'bhinabhyám údīṣitaḥ* 'Ich bin riesengross, bis zum Gewölk emporgestiegen' (Hauschild). Verse 8 *abhi dyām mahinā bhuvam abhīmām prthivīm mahīm* 'Hinausgewachsen bin ich über den Himmel durch meine Ausdehnungskraft, hinaus über diese grosse Erde' (Hauschild) ; 'J'ai débordé en grandeur le ciel . . .' (Renou). But there seems no reason for attributing this sense to the verb *abhi-bhū-* : rather, 'I have overcome by my greatness [not 'size'] heaven and earth'.

Such a hymn cannot have been composed by a poet under the influence of *soma* : the artifice of its structure excludes this. It is a dramatic monologue, and could easily have been composed by one without personal experience of the original *soma*. It begins with a wish for cattle and horses, a clear echo of the Soma of the earlier hymns who is invoked for booty in war (*vāja*). Two verses then add to this the idea that the *soma* impels the drinker forward like the wind. But verses 4 and 5 then revert to the other aspect, that of poetic inspiration. Only after this does the speaker come to the direct mention of conquest ; and finally—as is fitting for a god—to his setting down the earth where and wheresoever he will, and to his swelling up to fill the space between heaven and earth.

I am prepared to accept 10.119 as a product of poetic imagination. Others are, of course, at liberty to take the hymn as a serious description of the effects of drinking *soma*. Wasson does not cite it as direct evidence for his case, and justifiably so. Yet, if we exclude this hymn, what indisputable evidence is there in the RV that *soma* was 'hallucinogenic' ? There are ample grounds for believing that *soma* was a powerful stimulant, though even here we must bear in mind the possibility of a purely psychological enhancement of its physiological effects. In 8.48.3 *ápāma sómam amṛtā abhūmāganma jyótir dvidāma devān*, the poet speaks in exalted terms : 'We have drunk *soma*, we have become immortal, we have gone to the Light (of heaven), we have obtained the gods'. But far more of the Soma-verses are liturgical rather than inspired ; and many other gods are invoked for similar blessings. Exalted language is expected in liturgical utterances, and we can hardly suppose that all of these were drug-induced. The point need not be laboured.

'*The roots, leaves, blossoms, seed of Soma : where are they ?*'¹⁴ Wasson considers it odd that 'in a lengthy anthology of lyric poetry written over centuries . . . no poet ever speaks of these conspicuous parts of almost all chlorophyll-bearing plants, not even casually or incidentally'. Short of a conspiracy of silence, 'they were speaking of a plant that had neither seed nor blossom nor leaf nor root ; viz., a mushroom' (p. 18). The RV may in parts be 'lyrical', in a loose sense of the term ; but, to speak with precision, it is not an

¹⁴ Here and in subsequent paragraphs, such italicized headings are those of chapters or sections of Wasson's book. It has not seemed necessary to deal with every point which he raises, and only the arguments which he considers most vital for his case are discussed in detail. I trust, however, that I have passed over nothing of importance.

‘anthology of lyric poetry’. It is a collection of poems, almost all of which are hymns composed for religious rituals. In this religious context, the priests are concerned with the plant itself only at the stage of pressing out the sap : they are entirely preoccupied with the resulting *soma*-juice. On the fly-agaric hypothesis, we might with equal justice inquire, ‘where is the annulus?’—a notable feature of the mature *A. muscaria*. This feature can be seen in plate ix (not very prominently) and in the beautiful water-colour by Charles Poluzzi between pp. 10 and 11 ; but most of the plates show specimens which are too young, or are photographed from an angle which conceals this feature. Apart from the Pavamāna-hymns, other references are to the drinking of *soma* by other gods, or to the mythological aspects of Soma as a deity. When only the product is of religious significance, it does not seem in the least surprising that the priests should not be interested in roots, leaves, blossoms, or seeds, even if the original were a chlorophyll-bearing plant. The same argument is also applicable to Wasson’s view that the epithets and tropes applied to Soma are derived from the botanical characters of *A. muscaria*. Since this view is fundamental to his whole theory, most of his detailed examinations of ‘descriptions’ of the Soma-plant are suspect *ab initio*.

‘*Soma grew in the mountains.*’ This is important for the fly-agaric theory, since the plant grows only in mycorrhizal relationship with the birch and (less frequently) conifers. ‘In Northern Eurasia the birch and conifer grow at sea level. South of the Oxus and in India they are found only at a great height in the mountains, around 8,000 to 16,000 feet’ (p. 23). This would account for the increasing difficulty in obtaining supplies of the plant as the Indo-Aryans penetrated further south. The implicit syllogism is obviously invalid, by reason of the undistributed middle : at this point in the argument, many other plants growing in the mountains may still be considered possible. The twelve RV verses quoted here by Wasson show only that Soma (but plant or god ?) was located on the mountains.

In the Avesta also, Haoma grows on the mountain heights : *Yasna* 10.3, etc., *barəšnuš paiti gairinəm*. It seems thus to have been generally accepted that the Soma-plant did grow on mountains. But the facile deduction that it grew exclusively on mountains does not follow logically, and may be contradicted by two passages : *Yasna* 10.17 *vispe haoma upastaomi yatēti barəšnušva gairinəm yatēti jafnušva raonəm* ‘I praise all the Haomas whether those on the heights of the mountains, whether those in the valleys of the rivers’ ; RV 8.6.28, where the *vipra* (Soma) is said to have been born *upahvaré girinām samgathé ca nadīnām* ‘in the hidden place [or on the slope ?] of the mountains, and in the confluence of the rivers’.¹⁵ We may note also the name of the river *Amśumatī*,

¹⁵ In case it might be thought that this last expression is a periphrasis for ‘ocean’, it should be noted that the present verse (*ajāyata*) concerns Soma’s birthplace, whereas the ocean (*samudra*) in connexion with Soma is his ultimate destination, the filtered juice in the sacrificial bowls in the earthly sense, and the ‘heavenly ocean’ in the implied hieratic sense : cf. for example RV 1.110.1 ; 9.2.5 ; 9.29.3 ; 9.73.3. On the general question of Soma and the Waters, see Lüders, *Varuṇa*, I, Göttingen, 1951, 225 ff., 272, and J. Gonda, *The meaning of the Sanskrit term dhāman-*,

RV 8.96.13–15, the river ‘abounding in Soma-plants’. This river appears only in a legendary context ; but such a name is unlikely to have been used if it had been common knowledge that Soma-plants did not normally grow in river valleys.

On the other side, it could be argued that the *Amśumatī* contradicts nature simply because it is legendary ; or that river valleys do exist in the mountains higher than 8,000 feet. We might also suggest that the Avestan passage quoted above is not intended literally, but is only a poetic way of saying ‘all Haomas, wherever they may be’. Alternatively, Wasson could reply that such statements might be folk-reminiscences from a time when the ancestors of the Indo-Iranians knew the birch and the fly-agaric at low altitudes.

But whatever may have been the original plant and its distribution, Soma has become a god ; and mountains are natural homes for gods. The Olympian gods of Greece are an obvious example. Viṣṇu is a mountain-dweller (*giriḥṣit*) in RV 1.154.3—cf. *giriṣu kṣāyaṃ dadhe* of Soma in 9.82.3. In the preceding stanza, 1.154.2, Viṣṇu has the same epithet as Soma, *giriṣṭhā*, while the same line of verse is taken bodily into 10.180.2, where, however, it is applied to Indra. Compare also the reference to Viṣṇu and the Maruts in connexion with the mountains in 5.87.1. In 8.7.1. the Maruts are lords in the mountains (*vī pārvateṣu rājatha*), in 8.94.12 they are *giriṣṭhā*-, and in 5.57.8 they are dwellers in the high mountains, *bṛhadgirayah*. Indra is *pārvateṣṭhā* in 6.22.2, and is with Viṣṇu on the mountains in 1.155.1 *sānuni pārvatānām*. For later Hinduism, one need only mention Śiva, Pārvatī, and Kubera as residents of the Himālaya.

‘*The Two Forms of Soma*’ (p. 25). ‘I now come to a crucial argument in my case. The fly-agaric is unique among the psychotropic plants in one of its properties : it is an inebriant in *Two Forms*. *First Form* : Taken directly . . . by eating the raw mushroom, or by drinking its juice *Second Form* : Taken in the urine of the person who has ingested the fly-agaric in the *First Form*.’ Numerous reports of this phenomenon are cited from the writings of European visitors to Siberia (p. 25, and ‘Exhibits’ *passim*), and although the bio-chemistry involved still awaits scientific investigation, the use of urine in this way is so widely attested for the fly-agaric in Siberia that we can hardly deny it. Wasson believes that he has found evidence that Soma also had these ‘Two Forms’ in the RV. I am completely unconvinced that he has established this for Soma ; but since for him it appears to be the very corner-stone of his case for his identification of Soma with the fly-agaric, his discussion of the point must be dealt with in some detail.

In brief, Wasson’s evidence consists of only two verses from the RV, verses which have nothing in common except that they occur in Soma-hymns : 9.66.2 appears to mention ‘two forms’ of Soma (but gives not even a hint that one of the ‘forms’ might be urine) ; while 9.74.4 apparently states that the priests urinate the *soma* (but gives no indication that there was any question of

Amsterdam, 1967, 50. The stanza 8.6.28 was thought by Sāyaṇa to refer to Indra ; but the view of the commentary on the same verse in VS 26.15, referring it to Soma, is certainly right : cf. *indubhiḥ* at the end of 8.6.27, and Geldner’s note on 8.6.28.

drinking the urine). Apart from doubts about the interpretation of these two verses, which we shall discuss below, it seems to me incredibly weak as an argument to link these two unconnected passages, and to proceed to the deduction that urine was Soma's 'Second Form'.

9.66.2 *tābhyām viśvasya rājasi yé pavamāna dhāmanī
pratīcī soma tasthātuh.*

Renou translates: 'Avec ces deux formes, (la pure et la mélangée), qui se tiennent face (à nous), ô *soma*, tu règues sur toutes choses, ô Pavamāna'. It is unfortunate that Renou, following Geldner, should have translated *dhāmanī* here as 'deux formes'. Had he chosen some other rendering, Wasson might not have fallen into this particular trap. In other places, Renou gives for *dhāman* expressions such as 'institution', 'structures', 'positions', '(séjour) institution(nel)'; and it is not always clear to me what his intention was.

The word *dhāman* has been given the most diverse senses by ancient and modern writers. A recent monograph by Gonda¹⁶ presents a good case for understanding the *dhāman* of a Vedic god as 'to a certain extent . . . a "location" of a numen, of divine power, of a deity, i.e. not only or merely a "holder" or "receptacle" of divine power, a place, being or phenomenon in which a divinity sets or places itself, functions or manifests itself, or displays its power, or where its "presence" is experienced, but also a particular way of presenting or revealing itself, of locating or "projecting" a mode of its nature and essence, a hypostasis or refraction in which it is believed to be active'.¹⁷ Even if some scholars do not accept unmodified all of Gonda's interpretations of individual passages, this general sense appears to be satisfactory in the RV for the greater part.

It is true that such an understanding of *dhāmanī* in the present verse does not by itself contradict Wasson's idea: it could be argued that the *soma*-juice and the urine were 'two places of manifestation' of the god Soma. Gonda himself compares this verse with 9.68.6, where that *rūpa* (where the sense is indeed 'form') of Soma which was brought from heaven by the mythical falcon is juxtaposed in the same verse with the clarified juice; and he suggests that the *dhāmanī* of 9.66.2 are in fact these two forms. In this, he is following approximately Sāyaṇa's alternative interpretation of the *dhāmanī*, namely, the *aṃśu* (the plant before or during the pressing) as the one, and the pressed juice as the other.

The real stumbling-block is the fact that this verse is the only place where the dual of *dhāman*- occurs, not only of Soma, but in the whole of the RV. The word is frequent in relation to many deities besides Soma, and both the singular and plural are also frequent for Soma himself. In 9.96.18-19 Soma's third and fourth *dhāmans* are mentioned, the first and second being implicitly given in verse 17 of the same hymn—possibly though not certainly the *dhāmanī* of

¹⁶ J. Gonda, *The meaning of the Sanskrit term dhāman-*: see especially pp. 44, 47 ff. for the various *dhāmans* of Soma.

¹⁷ op. cit., 19.

9.66.2. But Soma has also numerous other *dhāmans* : for example, 1.91.4 *yā te dhāmāni divi yā prthivyām yā párvateṣv ósadhiṣv apsú: tébhir no vísvaiḥ* . . . ‘ With all these *dhāmans* of yours, (O Soma,) those in heaven, those on earth, those on the mountains, in the plants, in the waters . . . ’; cf. also 1.91.19. If Wasson’s ‘ *Two Forms* ’ had had any real place in Vedic religion, it is inconceivable that they should have been mentioned once, and once only. And, to put it mildly, the constant and continual mention of all these other ‘ forms ’ would have been very confusing.

Although Wasson does not seem to have realized the complete isolation of the dual of this word, he is of course well aware of the distinction between dual and plural in Vedic and Sanskrit grammar; and he quotes also 9.66.3 and 5, with *dhāmāni* and *dhāmabhiḥ* respectively. He adds in a footnote (p. 26), ‘ In ix 66² the dual number is used speaking of the *Two Forms*. This is natural as the poet faces two vessels containing, one the juice of Soma presumably mixed with milk, etc., the other Soma urine. In verses 3 and 5 he speaks of all Soma’s forms, the celestial, the plant, the juice, the Soma urine, and therefore uses the plural ’. It is not unreasonable to suggest, in contrast to Sāyaṇa’s and Gonda’s view cited above, that the dual in verse 2 may refer to the two vessels (*camū*) which receive the filtered *soma*-juice. These are well known, and often appear in the hymns. But it is a leap in the dark to suggest further that one of these vessels contains ‘ Soma urine ’. He himself complains, and with some justice, that ‘ the Vedic commentators,¹⁸ knowing nothing of the fly-agaric, have reached a consensus that the *First Form* is the simple juice of the Soma plant, and the *Second Form* is the juice after it has been mixed with water and with milk or curds ’. This explanation, he continues, ‘ is unsatisfactory because it flies in the face of the ṚgVeda text ’. So also, unfortunately, does his own explanation, since 9.86.47 explicitly states that the juice in both vessels was mixed with milk: *yád góbhīr indo camvòḥ samajyáse* ‘ when, O *soma*-juice, you are anointed with milk in the two vessels ’. Further, 9.96.20 *vīṣeva . . . kánikradac camvòr á viveṣa* ‘ like a bull bellowing mightily (the *soma*-juice) has entered the two vessels ’. Soma’s bull-roar is the regular figurative expression for the noise of the pounding-stones on the two pressing-boards (*adhiṣavaṇa-phalake*). Taken in conjunction, therefore, these last two verses show that the juice enters *both* vessels at the time of pressing, and that in *both* the juice was mixed with milk or curds. There is no place left for ‘ Soma urine ’.

The other verse upon which Wasson relies to establish the presence of ‘ Soma urine ’ in the RV is 9.74.4:

*ātmanván nábhō duhyate ghṛtām páya
ṛtásya nábhīr amṛtam ví jāyate :
samīcīnāḥ sudānavah prīṇanti tām
náro hitām áva mehanti péravah.*

¹⁸ Here he appears to mean some modern Vedic scholars, since he refers only to A. A. Macdonell, *Vedic mythology*, Strassburg, 1897, 82, 106; and see also Renou’s translation quoted above, where ‘ la pure et la mélangée ’ seems to be wrong. Sāyaṇa knows nothing of any such interpretation.

This he translates (p. 29), following Renou: 'Soma, storm cloud imbued with life, is milked of ghee, milk. Navel of the Way, Immortal Principle, he sprang into life in the far distance. Acting in concert, those charged with the Office, richly gifted, do full honor to Soma. The swollen men piss the flowing [Soma]'. (In passing, note that 'richly gifted' is a misunderstanding of Renou's 'aux beaux dons': *sudānu-* is 'richly giving'—though possibly the sense of 'moisture' is preferable here: Grassmann, 'tropfenreich, schön träufelnd'.)

Geldner translates the second half of the verse as: 'Vereint stellen ihn die Gabenschönen zufrieden; den zur Eile Getriebenen pissen die schwellenden Männer herab'; and he adds the laconic footnote, 'Zunächst die Priester, zugleich aber Anspielung auf die Marut, worüber 2,34,13 zu vergleichen'. In the verse referred to, the relevant phrase is *nimégghamānā ātyena*, i.e., the Maruts (Rudras) pouring down rain, figuratively considered as the urine of their heavenly horse(s).

It has been suggested that two distinct roots are involved: (a) with IE *-gh-, whence Ved. *meghá-*, Av. *maēya-* 'cloud'; Ved. *mih-* 'mist, drizzle, rain'; and (b) with IE *-ǵh-, whence Ved. *méhati*, Av. *maēzaiti* 'urinate'; Ved. *mih-*, ptc. *mīdha-*; *meha-* 'urine'; *medhra-* 'penis'. For further details, see J. Pokorny, *Indogermanisches etymologisches Wörterbuch*, 712–13; M. Mayrhofer, *Kurzgefasstes etymologisches Wörterbuch des Altindischen*, s.vv. *megháh*, *méhati*; H. W. Bailey, *Khotanese texts*, VI, 248, s.v. *bīysma*. Since, in the normal development of Indian phonology, the two roots would have collided in the *mih-* forms in Vedic, it is not unexpected that *nimégghamāna-* 'raining down' should be thought of by the poet as suggesting the urine of a heavenly horse; and in 1.64.6, quoted below, there would be a pun on the two senses in the word *mihé*. Wasson writes (p. 30), 'The blessings of the fertilizing rain are likened to a shower of urine. . . . Urine is normally something to cast away and turn from, second in this respect only to excrement. In the Vedic poets the values are reversed and urine is an ennobling metaphor to describe the rain. The values are reversed, I suggest, because the poets in Vedic India were thinking of urine as the Divine Inebriant, the bearer of *amṛta*'. I suggest, rather, that an explanation may be the coalescence of two originally distinct words *mih-* in Vedic, and the consequent conflation of other derivatives of the two roots in the minds of the priests, coupled with the obvious fact that 'to urinate' would, semantically, be a very easy metaphor for 'to pour down rain'. However, such an explanation may well be beside the point, and it would be more economical to assume alternative enlargements in a single IE root. The root *muh-* appears to behave similarly: with *-gh-, Av. *ašēmaoya* 'Irrlehrer', and Sk. *mogha-*, *mugdha-*; with *-ǵh-, Khot. *mūysaṃdai* 'foolish', and Sk. *mūdha-*. (See H. W. Bailey, *Khotanese texts*, IV, 79.) For the root *mih-*, I. Gershevitch has shown ('Etymological notes on Persian', in *Dr. J. M. Unvala memorial volume*, Bombay, 1964, 89 ff.) that Modern Persian *mih* 'mist, fog', contrasting with *mēy* 'cloud', could represent an OPers. **midam*, Av. **mizəm*, and that Middle Iranian attests related forms with -z- where urine is not involved.

Geldner's conjecture that 9.74.4 refers in the first place to the priests pissing in the ritual, though not impossible, seems highly improbable. On the other hand, for reasons given below, the presence of the Maruts in the verse is beyond dispute.

Renou's complete translation of the same half-verse is: '(Agissant) de conserve, (les officiants célestes) aux beaux dons comblent le (*soma*); les (Marut,) seigneurs à la vessie-pleine, compissent (le *soma*) mis-en-branle'. We cannot discuss here the much-disputed meaning of the word *péru-*, *perú-*; ¹⁹ but I should prefer to see in this verse the sense accepted by Renou for *péru-* in his translation of 10.36.8 (*EVP*, v, 52), 'fertilisant', and to translate the last phrase as 'the heroes (the Maruts), fertilizing (the earth), pour down as rain the impelled (*soma*)'. Observe in particular the use of the preverb *áva*, which occurs with *mih-* only here in the RV.

Wasson appears to have thought that Renou was having recourse to a rather far-fetched expedient in an otherwise incomprehensible verse: 'But to give meaning to the sentence he [Renou] introduced the gods of rain, the Maruts. Certainly there are precedents for the clouds' "urinating" rain. But in this verse and at this point in the hymns the Maruts are out of place. From IX 68 to 109 there are 24 other citations of *nṛ* in the plural (men) and in every instance they are the officiants at the sacrifice. So are they in 74⁴' (p. 30).

Neither objection is valid. Granted that in the hymns in question the *naraḥ* are normally the priests, this does not exclude the possibility of a double sense in this verse. In the RV as a whole, the Maruts are called *naraḥ* frequently, probably more often than any other group of deities. They appear not seldom in the Pavamāna-hymns; and in 9.66.26 Soma has them as his 'troop' (*marúdganaḥ*), while in 9.107.25 the *somas* are 'accompanied by the Maruts' (*pávamānāḥ . . . marútvantaḥ*). Here, then, it is possible to interpret the last line of the verse to mean that the officiants (*naraḥ*) pour down (*áva mehanti*) the streams of *soma* into the receiving vessels, just as the Maruts (*naraḥ*) pour down rain (*áva mehanti*) from heaven. In the case of the priests, such a metaphorical understanding of *áva mehanti* would be hardly more far-fetched than the frequent use of *duh-* 'to milk (the juice from the Soma-plants)'.

The introduction of the Maruts here is no mere guess on Renou's part. In his note on the verse under discussion he remarks that *mih-* 'to urinate' is hardly attested at all in the RV except in the figurative sense of 'rain'; and he compares 1.64.6, where the Maruts are named:

pínvanty apó marútaḥ sudānavah
páyo ghrítavad vidátheṣv ābhúvāḥ :
átyam ná mihé ví nayanti vājínam
ítsam duhanti stanáyantam áksitam.

'The Maruts of good wetness (or good gifts?) cause the waters to swell, the ghee-possessing milk (liquid), efficacious in the sacrificial rituals. They lead

¹⁹ For bibliographical details of earlier discussions of this rare word, see M. Mayrhofer, *Kurzgefasstes etymologisches Wörterbuch des Altindischen*, s.v.

aside their booty-winning steed, like a racehorse, to urinate (rain); they milk the thundering, imperishable water-spring.'

Observe that 9.74 is much concerned with rain in other verses also: verse 1 *divó rétasā . . . payovṛdhā* 'the semen of heaven (rain) which increases with milk'; 3 *īše yó vṛṣṭéh . . . apām netā* '(Soma) who rules over the rain . . . the leader of the waters'; 5 *ārāvīd amśúh śacamāna ūrmīnā devāvyām mānuṣe pīnvati tvācam: dādihāti gārbham āditer upāstha ā* 'The Soma-plant has roared, accompanied by the wave (of the waters), for man it swells up its skin which invites the gods: it places the seed in the lap of Aditi'. Here *tvac-* has the double sense of the outer covering of the plant, and the heavenly leather water-bottle from which the gods pour rain: cf. 1.79.2 *pātanti mīha stanáyanty abhrā* 'the rains fall, the clouds thunder', 3 *tvācam prñcanti* 'they fill(?) the leather water-bottle'; 1.129.3 *pīnvasi tvācam* 'you (Indra) swell up the leather water-bottle'; also 5.83.6 *divó no vṛṣṭīm maruto rarīdhvam prá pīnvata vṛṣṇo áśvasya dhārāḥ*, and 7 *dṛtim*.

If we now compare the vocabulary of 9.74 with that of 1.64.6, the agreements are seen to be far too many to be accidental: *pīnvanty apó—pīnvati tvācam*; *sudānavah, páyah, and ghṛtā-* in both; *duhanti—duhyate*; *mihé—áva mehanti*; *stanáyantam—ārāvit*; *ákṣitam—amṛtam*. The 'imperishable water-spring' is by implication Soma: cf. 1.154.6 *vṛṣṇoḥ padé paramé mádhva útsaḥ* 'in the highest footstep of Viṣṇu there is a spring of *madhu* (i.e. *soma*)'.

This is beyond mere coincidence. Renou did not 'introduce' the Maruts into 9.74.4 as an expedient 'to give meaning to the sentence': his note referring to 1.64.6 shows that he was aware that the terminology of the verse compelled the interpretation which he gave. There is no need to see 'Soma urine' in Wasson's sense, therefore, in 9.74.4 either: only the *soma*-juice itself flowing into the sacrificial vessels, poetically conceived as the pouring down of fertilizing rain from heaven.

As if it were confirmation that fly-agaric urine was a feature of Indo-Iranian religion (and hence pre-Vedic), Wasson quotes also (p. 32) an isolated phrase from one of the Gāthās of Zarathushtra, *Yasna* 48.10 *kadā aṣṇ mūθrēm ahyā madahyā* 'When will you (O Mazdāh) smite down the urine of this intoxication?' (not, as in the translation quoted, 'this urine of drunkenness'). It seems certain that Zarathushtra here is castigating the Haoma-ritual; but there is no reason to see in the word *mūθra* anything more than a strong term of abuse.

It is convenient to recall here that the Avesta knows also *hurā* (discussed at the beginning of this article) and *maḍu-*. The latter is given by Bartholomae ' (Wein usw.) Beerenwein'. While this may possibly be anachronistic for the earlier period, there is no doubt that the word meant 'wine' at a later time: Sogd. *mōw*, *mūd-*, Khot. *mau*; ²⁰ also Central Asian Prakrit *masu* 'wine'. The etymological connexions are well known: Classical Sanskrit *madhu* 'honey',

²⁰ I. Gershevitch, *Grammar of Manichean Sogdian*, § 408; H. W. Bailey, *Khotanese texts*, VI, 284.

where the sense is confirmed by *madhukara* 'bee', and by Tibetan *sbran-rtsi*, Chinese 蜜 'honey' in translating *madhu* in Buddhist texts; Greek μέθυ 'wine' (?); English *mead*.²¹ The dictionaries, however, recognize the sense of 'intoxicating drink' in Classical Sanskrit also: *madhumatta* and other compounds. Compare also Pāṇini 4.2.99 (mentioned by Dr. O'Flaherty, p. 115, n.), where the *Kāśikā* commentary, giving as examples *kāpiśāyanam madhu* and *kāpiśāyanī drākṣā*, appears to suggest a connexion between the grapes of Kāpiśī and the *madhu* of the same region: *madhu* then possibly meaning here 'grape-wine'. In the RV the word *madhu* is very frequently linked with *soma*, and often by itself denotes or implies *soma*. In 1.117.6 and 1.116.7, *madhu* and *surā* appear in parallel contexts (see above, p. 331). It is thus not improbable that in the RV *madhu* does not refer to the 'sweetness' of *soma*, but rather that it conveys the sense of 'soma, the (divine) intoxicant'. In the circumstances, it is slightly odd to find Wasson writing (p. 16), 'Honey, *mādhu*, is mentioned frequently in the ṚgVeda but mead never'. When the words are etymologically the same, how can one draw such a distinction? By these remarks I do not mean to revive the absurd theory that *soma* was mead; but it is not impossible that the Vedic Indians conceived the pressed juice as a sort of 'mead', in respect of its exhilarating properties.

'*"Hāri" and Red*' (p. 36). '*Hāri* is the most common of the colour epithets for Soma in the ṚgVeda. Numerically it far exceeds all the other colour words put together and rivals the epithet "bull" that the poets never tire of applying to Soma. The word *hāri* is cognate with *hīraṇya* (golden) in Sanskrit and with *χόλος* (gall) and *χλωρός* (yellow) in Greek, and ultimately with the English "gall" and "yellow". *Hāri* is the precise adjective that one would wish to employ in Vedic to describe the fly-agaric. *Hāri* is not only a colour word: the intensity of the colour is also expressed by it. It is dazzling, brilliant, lustrous, resplendent, flaming. [On what evidence, one wonders, are the last two sentences based?] In colour it seems to have run from red to light yellow.'

Much of this is acceptable, but the slanting of the linguistic evidence is breathtaking. The word *hari* 'golden' is precisely not the adjective which one would wish to apply to the flaming red fly-agaric; and I have been unable to find any evidence that any shade of red is included in the colour-range denoted by *hari*. The Greek *χλωρός* can be used of honey, but its normal sense is 'greenish-yellow, the colour of young grass, pale green'. Compare also the modern term 'chlorophyll' itself. Wasson adds a footnote, 'Occasionally in later times *hāri* came to include green among its meanings, but this usage seems not to be ṚgVedic, except possibly in the late hymns that we exclude from consideration'. It may well be that the sense of 'green' does not occur in the RV, but it is not the case that this sense is a post-Vedic development. It is attested in Iranian, where Avestan *zairi-gaona-* is used of Haoma, 'golden-coloured', but also of *urvarā-* 'plants', where it must mean 'green'. Sogdian *zrywn* is 'green', and

²¹ For other cognates, J. Pokorny, *Indogermanisches etymologisches Wörterbuch*, 707.

‘vegetable’.²² In Khotanese, the derivative of the same word, *ysarūna*- renders Skt. *harita*- (usually green, of grass, or greenish-yellow), and ‘green’ (of beans); and ‘golden’, is well attested, *ysaragūna* translating *suvarṇa-varṇa*, *ysarragūnā* where the Tib. has *gser-gyi kha-dog-can*, both ‘of golden colour’.²³ From M. Boyce I have Parthian *zrgwng*, used as an adjective for a juniper tree; and *hwzrgwn* (also in Manichaean Middle Persian), describing a garden, a hill upon which sheep graze, and trees. Modern Persian has *zard* ‘yellow’, *zarrīn* ‘golden’. In later Sanskrit, the meaning ‘yellow’ predominates, with doubtless a tinge of brown or tawny when *hari* is used of lions or monkeys. For Buddhist Sanskrit, the *Mahāvvyutpatti* has *harita*, Tib. *ljan-khu*, Ch. 綠 ‘green’; and *hari*, Tib. *ser-skyā* ‘light yellow’, Ch. 黃 ‘yellow’. I. Gershevitch has drawn my attention to Parsi Sanskrit *lohita*, *pātala*, used to translate Avestan *zairita*-; but this is much too late to be relevant, and doubtless indicates only imprecision on the part of the Parsi translator.

In addition to Indo-Iranian, the cognates of *hari* are spread in great profusion throughout all the main groups of the Indo-European languages. There are a very few isolated examples where the colour-range seems to have been extended beyond the green, so that ‘blue’ or ‘grey’ may occur in some languages. But overwhelmingly, the other Indo-European languages have cognates denoting ‘golden, yellow, yellowish-green, green’, but nowhere at all any which suggest ‘red’.²⁴

Not only from Indo-Iranian, then, but from Indo-European as a whole, we have incontrovertible evidence that *hari* belongs to a group of words which in the parent language covered that part of the spectrum which runs from yellow into the green. There is no evidence that its range extended even into the orange; and red is absolutely excluded.

Thus the majority of Wasson’s colour plates of the pure red fly-agaric are irrelevant to all points which he intends to illustrate by them in relation to the word *hari*. Plate iv, for example, shows the round red ball of a fly-agaric which has lost its white specks, and is labelled ‘The sun’. Under appropriate climatic conditions, the sun may look like this at dawn or sunset: but this is not *hari*. On the other hand, it is entirely appropriate that the horses of the sun should be *hari*, ‘golden’.

It would be unfair to suggest that this mistake was an intentional bending of the evidence, although one may suspect some degree of special pleading due to the fact that the author had already made up his mind that the fly-agaric was Soma. Most probably he was unconsciously simply taking a step beyond the mistranslations of Bhawe, who, besides ‘yellow one’, renders *hari* in different hymns as ‘reddish-brown’, ‘tawny-brown’, ‘golden-brown’, ‘yellow-brown’—but not ‘red’ or ‘scarlet’.

It is also possible that Wasson was unduly influenced by Renou’s regular

²² Gershevitch, op. cit., § 1113.

²³ H. W. Bailey, *Khotanese texts*, vi, 289, q.v. for more detailed information.

²⁴ Pokorný, op. cit., 429 ff.

rendering of *hari* in the Soma-hymns by 'alezan'. He would have been better advised to have followed Geldner here. The German 'falb' may sometimes be used as a colour-adjective, but 'der Falbe' is almost inevitably a horse, a 'creamy-yellow' horse. For Soma and the horses of the sun, Geldner almost always translated *hari* as 'der Falbe'. Renou apparently intended to follow Geldner's view that the *hari* Soma was regularly a horse, since in French 'un alezan' is always and exclusively a horse: the big French lexicons are unanimous in this. Unfortunately, the colour is as misleading as the earlier English rendering 'bay horse'; for 'alezan' is a horse of a reddish-brown colour, virtually 'chestnut horse'.²⁵ At least one French dictionary, however, takes 'alezan' to be a yellow horse.²⁶ I cannot tell whether this is a mistake, or whether some speakers of French have only a vague idea of the meaning of the term. Certainly, as a speaker of English with no acquaintance with horsemanship, I myself have no clear knowledge of the meaning of many terms connected with horses. Renou may have thought that 'alezan' was a good translation of 'Falbe'; or he may have intended merely to make it clear that Soma as *hari* was a horse, without considering the colour of the horse relevant for his purpose. For the fly-agaric hypothesis, however, the colour is highly relevant: *hari* is 'golden', and when Soma is thought of as a horse, it is a 'golden horse', not a red one.

Wasson also quotes other colour-adjectives applied to Soma (p. 37): *vṛṣā śónaḥ* ('the red bull'); and *aruṇa*, *aruṣa*, *babhru*. We have here a reasonable mythological situation: when Soma is associated with the sun, or occasionally identified with the sun (*sūra*-), he is 'golden', or a 'golden horse'; when associated with Indra, the thundering rain-giver, Soma is the bellowing bull, and appropriately has colour-terms tending towards the red. In mythological thought, there is no contradiction in Soma's appearing in both roles simultaneously: 9.8.6 *aruṣó háriḥ*, Renou 'le (dieu) fauve, l'alezan', Geldner 'der rötliche Falbe'; but perhaps rather 'the red (bull), the golden horse'. In 9.66.26, Soma is *hariścandra*:- Renou 'brillant (comme) l'or', perhaps following Geldner, 'der Goldschimmernde'. But in 3.44, where there is much verbal play on *hari*, *harita*-, etc., Renou, with one exception, takes the sense of 'golden'; but Indra's epithet *haryaśva* is translated in verse 2 as 'aux chevaux alezans' (Geldner, 'goldrossiger Indra'), and in verse 4 as 'aux chevaux d'or' (Geldner, 'der Goldrossige'). Possibly this is a hint that Renou intended 'golden' throughout.

²⁵ *Dict. historique de la langue française* (Académie Française), 'De couleur fauve, tirant sur le roux. Il ne se dit qu'en parlant de chevaux'; Littré, 'le corps est recouvert de poils rouges ou bruns plus ou moins foncés'. Professor W. Simon has kindly confirmed for me the yellowishness of *Falbe*, quoting also Kluge, *Etymologisches Wörterbuch der deutschen Sprache*, and the reddishness of *alezan*: Meyer-Lübke, *Romanisches etymologisches Wörterbuch*, which gives 'braunrotes Pferd'. The French word is borrowed from Spanish (ultimately of Arabic origin), and the Spanish *Larousse* defines *alazán* as a horse with hair more or less *rojo canela* 'cinnamon red'.

²⁶ Hatzfeld and Darmesteter: '(En parlant d'un cheval.) Qui a la robe d'un jaune plus ou moins clair'.

In passing, we may note that Indra is described as *haryaśva* more than twenty times in the RV, the epithet being exclusively his: and the poets may sometimes have felt that part of the sense at least was 'having Soma as his horse'.

On p. 41 Wasson describes vividly how the brilliant red of the fly-agaric fades with the daylight, until in the late dusk or by star or moonlight the mushroom appears to shine with a pale silvery colour. This, he believes, is the phenomenon referred to in 9.97.9d *dīvā hárir dādṛśe náktam ṛjrāḥ* 'le jour il apparaît couleur-d'alezan, la nuit, blanc d'argent' (Renou). Wasson translates, 'By day he [Soma] appears *hári* [colour of fire], by night, silvery white'. This is illustrated in plate VIII by two charming photographs, one of a group of red fly-agarics by daylight, the other showing the same group photographed in near-darkness; and the latter are indeed silvery white. Unfortunately, this will not do. Enough has already been said to show that *hari* is not red. And it is not entirely frivolous to remark that there are many colours of fire: RV 10.20.9 lists seven of these, *kṛṣṇa*, *śveta*, *aruṣa*, *bradhna*, *ṛjra*, *śona*, and *hiranya-rūpa*. Here the reddish shades of fire are described as *aruṣa* and *śona*, while *hiranya-rūpa* 'colour of gold' obviously corresponds to *hari*. Except for this verse, all other eleven instances of *ṛjra* in the RV refer, either explicitly or contextually, to horses. The word thus definitely belonged to the vocabulary of horsemanship.

In the first line of 9.97.9, Soma is called *urugāya*: Viṣṇu in his solar aspect crossing the sky. In line 3, *parīṇasām kṛṇute tigṃśáṅgo* 'He of the sharp horns fills out his full extension', we may see the poet fancifully visualizing the horns of Soma the bull as the horns of the waxing moon. But even without the assistance of lines 1 and 3, the last line of the verse is open to one interpretation only: 'by day, he appears as a golden horse, by night as a silvery horse'. Geldner's brief footnote is entirely justified: 'Soma als Sonne und Mond'.

Indra, as already noted, is *haryaśva*: the use of *ṛjra* as a word for a horse-colour is further justified by the appearance in the RV of *ṛjrāśva* as the proper name of a man, 'possessor of *ṛjra*-horses'. A man of the same name is mentioned in the Avesta, *ərəzrāspa* (*Yašt* 13.121). As the Vedic shows, the sense 'des Rosse gradaus, gradan gehen', given by Bartholomae for the Avestan name, is wrong. F. Justi (*Iranisches Namenbuch*, 89) renders the name as 'braunrothe Rosse habend'; but, in giving the wrong colour, he is merely following Grassmann.

It should be added that Geldner and Renou are not necessarily right in seeing Soma as a horse in every place where he is called *hari*, even if this idea must often have been in the minds of the composers of the hymns. Soma is admittedly compared with a horse: 9.71.6 *ásvo ná devāṃ ápy eti yajñīyah*; 8.2.2. *ávyo vāraiḥ páripūtaḥ áśvo ná niktó nadīṣu*; 9.65.26 *prá śukrāso vayojuvo hinvánāso ná sáptayah*; 9.88.2 *átvo ná mṛṣṭáh*; also 9.86.26 and 9.109.10. We cannot at present exclude the possibility that 'golden' refers in the first place to the colour of the plant, or, more probably, to the colour of the *soma*-juice. The same uncertainty as between mythological characteristics, the plant, and

the sap applies to *babhru* and other colour-adjectives. This would still leave us with a wide choice of possible plants.

Another term applied to Soma, *āśu-*, is also often taken to mean 'swift (horse)'. Perhaps this too is sometimes right, and *āśu* 'the swift one' can certainly mean 'horse' elsewhere in the RV. For Soma, modern translators fluctuate between 'swift (horse)' and simply 'swift'. If the former was intended for Soma by the composers of the RV, it may seem to be an Indian development, since in the Avesta, *Yast* 10.89, the priest Haoma is *āsu.yasna-* 'promptly-sacrificing' (Gershevitch, *The Avestan hymn to Mithra*). Conceivably, the Indo-Iranian use of 'swift' in this context originally referred to the speed with which the *soma*-drug took effect. In contrast to poisoning with the much more deadly *Amanita phalloides*, where the symptoms often do not appear for many hours, in cases of poisoning by *A. muscaria* (*mycetismus nervosus*) the onset of the symptoms is very rapid, appearing within a few minutes to within two hours after ingestion. Here we have a coincidence which is nicely consistent with Wasson's hypothesis. But again, it is no proof, since many other available plants may produce rapidly acting chemical substances.

'He makes [of milk] his vesture-of-grand-occasion' (plate VII, and p. 40); 'The hide is of bull, the dress of sheep' (plate IX, and p. 41). These two plates are among the most visually persuasive for Wasson's theory. The 'vesture-of-grand-occasion' is Soma's *nirñij* (Renou, 'robe-d'apparat'). The photographs show the bright red skin of the fly-agaric tufted over with the fragments of the milky white envelope as it breaks up, the 'tufts of snowy wool'. Plate IX illustrates 9.70.7d *gavyáyī tvág bhavati nirñij avyáyī*. On this Wasson writes, 'At least some of the poets knew their fly-agaric *in situ*, high in the mountains: could the last phrase in this verse have been written by anyone who did not know it?'. The answer is, yes: the verse could easily have been composed without any knowledge of the fly-agaric, and almost certainly it was so composed.

'The hide is of bull': this refers to the *adhiṣavaṇa-carma*, the bull-hide spread over the pressing-boards (*adhiṣavaṇa-phalake*) on which the plants were pounded. A bull-hide was chosen for this purpose probably partly because it was the most convenient material available, and, perhaps more important, because it was theologically relevant in respect of the thundering bull Indra and the bull Soma. It is not a guess that the bull-hide here is the one used at the pressing-ritual: the point is implicit in the earlier part of the same verse: *ruvāti bhīmó vṛṣabhás . . . ā yónim sómah sūkṛtam ní śīdati* 'The terrible bull roars . . . Soma sits down in his well-fashioned *yoni*'. Soma 'roars' when pounded by the pressing-stones; and his 'birthplace' here, as frequently, is not the mountain-home of the plant, but the place from which, at the pressing, the juice, the *soma*, is born from the plant. In several other verses, the same bull-hide is explicit: 9.65.25 *pávate . . . hinvánó gór ádhi tvací* 'He purifies himself, being impelled on the hide of the bull'; 9.66.29 *eṣá sómo ádhi tvací gavām kṛīḷaty ádribhiḥ* 'This *soma* sports with the pressing-stones on the hide of

the oxen'; 9.79.4 *ádrayas tvā bapsati gór ádhi tvací* 'The pressing-stones devour you on the hide of the bull'.

Similarly, 'the dress of sheep' refers to the ritual, not to the plant, Soma's *nirñij* being here the woollen filter. Since a filter was necessary, sheep's wool was a natural choice of material. Again, the fact that the reference is to the pressing-rite is made explicit in another hymn; 9.99.1 *śukrām vayanty ásurāya nirñijam vipām ágre* 'the fingers of the priests weave for the Asura (Soma), at the beginning of the sacred hymns, a white festal garment'. In other words, the woollen filter as festal garment was made at the time of pressing; and there is no hint anywhere that the natural plant possessed a garment of wool.

For Wasson's theory, it might be argued that, granted the direct reference in the hymns is to the ritual use of the bull's hide and the woollen filter (or the mixing-milk), nevertheless these materials were chosen precisely because the fly-agaric has a red skin and a garment resembling tufts of wool. But this would assume the point which is to be proved. If and only if we can *first* prove that the Soma-plant was the fly-agaric, then and only then can we suggest that these ritual features were influenced by the characteristics of the natural plant: otherwise we are arguing in a circle. So far as I have been able to discover, the text of the RV never links any of the ritual facts to the features of the living plant.

Although in these verses Soma's *nirñij* is the woollen filter, the term is much more frequently used of milk or curds with which the juice was mixed. The mixing of the juice with milk is mentioned so often in the Pavamāna-hymns that it is superfluous to cite references. Among those passages where the milk is directly called Soma's *nirñij*, a few may be quoted as examples: 9.14.5 *gāḥ kṛvāno ná nirñijam* 'making milk, as it were, his festal garment'; similarly 9.86.26; 9.68.1 *índavo ... barhiṣádo ... usríyā nirñijam dhire* 'The soma-juices ... seated on the ritual-strew ... have donned as their festal garment the (milk of the) cows of dawn'. As everywhere, this garment is put on at the time of pressing: the Soma-horse whinnies, i.e., resounds under the blows of the pressing-stones: 9.95.1 *kánikranti hárir á srjyámānaḥ ... punānāḥ ... kṛñute nirñijam gāḥ* 'The golden horse whinnies mightily while being released [i.e., the juice being set free from the solid parts of the plant]; being purified ... he makes his festal garment of milk'. With the same sense, 9.97.2 *bhadrā vástrā samanyā vásāno ... camvoḥ pūyámānaḥ* 'Putting on auspicious festive garments ... being purified into the two receiving vessels'. This mixing must have been common Indo-Iranian: *Yasna* 10.12 *haomō gaoma* 'Haoma, milk-possessing'; *Yašt* 10.6 *haomayō gava*.²⁷

The mixing with milk or curds is discussed in some detail by Wasson (pp. 27 ff.). It is therefore surprising that, while quoting in full the Sanskrit text of 9.69.5, he should omit from his translation the vital word *camvoḥ*, thus concealing the fact that the whole verse is descriptive of the mixing with milk in the recipient bowls, after the juice has been pressed:

²⁷ On this, see Gershevitch's note on the verse in question in *The Avestan hymn to Mithra*.

āmṛkṭena rúṣatā vāsasā hárir
āmartyo nirñijānāḥ pári vyata :
divás prṣṭhām barhánā nirñije kṛto-
-pastāraṇam camvòr nabhasmāyam.

Renou's translation is: 'D'un vêtement immarcescible, brillant, l'alezan immortel, paré-de-neuf, s'enveloppe tout autour. Avec puissance il a pris le dos du ciel pour s'en parer, (il a fait du lait) un tapis semblable-à-la-nuée pour les deux vases (sômiques)'. Wasson quotes this opposite plate II, but omitting the words '(il a fait du lait)' — a suppletion, but undoubtedly correct—and, more important, omitting also the phrase 'pour les deux vases (sômiques)'. His own rendering of the second half of the verse (p. 41) is: 'By authority he has taken the back [*i.e.*, the vault] of heaven to clothe himself in, a spread-cloth like to a cloud . . .'. The replacement of *camvoḥ* of the original by three dots hides from the reader who does not know Sanskrit the fact that the garment which is *nabhasmayam* is the milk which 'spreads like a mist' through the *soma*-juice in the vessels. As with the bull's hide and the sheep's wool, it is not made clear that the milk as 'the vesture-of-grand-occasion' is assumed by Soma only in the course of the ritual. The verse does not refer to the living plant.

The word *nirñij-* has usually been taken to be etymologically connected with *nij-* 'to wash', Greek *νίζω*, etc.:²⁸ hence, 'a thoroughly washed (garment)'. This would be in keeping with later Indian attitudes, which require a new (*anāhata*) or at least a freshly washed garment for ceremonial occasions. H. W. Bailey²⁹ proposed a different etymology: 'Beside the bases Indo-Iran. *naiṣ-* and *naiš-* a third form *nai-g-* could be expected. This base seems to be contained in Rigvedic *nirñig-* 'garment, covering' which has perhaps too long been connected with *neg-* 'to wash' with difficult conjectural intermediaries'. If this proposal is accepted, it may still be the case that the composers of the RV did connect *nirñij-* with *nij-* 'to wash', by the operation of a 'folk-etymology'. In a number of instances, *nirñij-* has no obvious connexion with washing: 1.25.13 *bíbhṛad drāpīm hiraṇyāyaṃ vāruṇo vasta nirñijam* 'Wearing a garment of gold, Varuṇa has put on a *nirñij*'; also 1.113.14; 10.27.24 *sá pādúr asya nirñijo ná mucyate* 'his foot (?)³⁰ is freed as from a garment'; 5.62.7 *hiraṇyanirñik . . . sthūnā* 'pillar clad in gold'. But, as we have seen, Soma's *nirñij* is more frequently milk than anything else; and the poets appear to play on the sense of 'washing' in a number of hymns. Thus, 9.71.3 *vrṣāyáte nábhasā . . . nenikté apsú* 'He (Soma) plays the part of the bull by means of the cloud (semen, as an alternative expression for the mixing-milk), he is washed thoroughly in the waters'; and compare 8.2.2 *ásvo ná niktó nadīṣu*, quoted above. In 9.69.5, *nirñijānāḥ* (Renou, 'paré-de-neuf') cannot of course be thought of as a denominative formed from *nirñij-* 'festal garment', but is rather 'washed down', as a play upon words, with *nirñije* later in the same verse.

²⁸ Pokorny, op. cit., 761.

²⁹ BSOAS, XXIII, 1, 1960, 23-4.

³⁰ See Mayrhofer, op. cit., s.v.

Renou's note here (*EVP*, ix, 78) is insufficiently precise. In 9.82.2, Soma's *nirñij* is *ghṛta*; and Agni is naturally *ghṛtānirñij*- in 3.17.1, 3.27.5, 10.122.2; and so also Apām Napāt as Agni, 2.35.4 *ghṛtānirñij apsú*. Mitra and Varuṇa have a *nirñij* of *ghṛta* in 5.62.4 and 7.64.1, where Renou suggests that *ghṛtāsya nirñijah* evokes the idea of rain. The Maruts are *varṣānirñijah* in 3.26.5 and 5.57.4

'*The udder and Soma*' (p. 43); '*The stalk and Soma*' (p. 44). 'The swollen hemisphere of the fly-agaric's cap naturally suggests an udder to the poet.' 'Not only is the Soma plant likened to an udder; the stalk or *aṃśu* (literally a "shoot", a perfect word for the stipe of a mushroom) is likened to a teat.' The direct use of the word *ūdhaḥ* does occur in connexion with Soma; but the second statement is not precise. All that is said is that the *aṃśu* is milked, and a comparison with a teat can then be only implicit. Perhaps this is no bad thing for Wasson's theory, since if the Vedic poets held both of these conceptions, one might be disposed to smile at their curiously inverted idea of an udder suggested by a mushroom with its stipe. If the suggestion made earlier in this article is accepted, that *aṃśu* is not 'stalk' but the name of the Soma-plant, the stipe would not be relevant. No elaborate discussion is needed. When the *soma*-juice is pressed out of the plant, the verb 'to milk' is a natural metaphor, whence 'udder' follows equally naturally. There is no need to invoke the shape of a mushroom to explain such a metaphorical usage.

In passing: 1.137.3 *aṃśúm duhanty ádribhiḥ sómam duhanty ádribhiḥ* supplies an excellent early example of the double accusative with the verb *duh*-, well known in Pāṇini 1.4.51 *akathitam ca*, illustrated by *gām dogdhi payaḥ*.

'Soma's "head"' (pp. 45-6). The suggestion is made that the 'head' in connexion with Soma refers to the pileus, the cap of the mushroom. One of the examples quoted, 9.68.4 *aṃśúr . . . rákṣate śírah* 'the *aṃśu* protects his head', is mysterious, and the sense behind the verse is not made clearer by the mushroom theory. In his note on the verse, Renou conjectured that the 'head' is 'la portion pure ou céleste du *soma* . . . préservée des tribulations de la portion impure—*riprá* 78, 1—ou terrestre'. In the remaining four examples quoted by Wasson, Soma's head, *mūrdhan*-, or his 'head of heaven' *divó mūrdhā*, is present in the filtered juice. This would exclude any solid part of the plant, mushroom or otherwise.

'*The single eye*' (plate x and pp. 46-7). The fly-agaric in plate x, labelled 'The single eye', is the same photograph of which plate iv, labelled 'The sun', is an enlarged detail. There is no harm in this, since 'the single eye' is in fact the sun, as the verses quoted here by Wasson confirm, though such confirmation is hardly needed. And if we are not convinced that the mythological connexion between Soma and the sun is due to the fly-agaric, 'the single eye' adds nothing. Without attempting to explore other aspects of Soma's solar features, we need only remark that Soma has become a great god, and great gods naturally have the sun as their eye. It is trite to remark that the sun is the eye of Mitra and Varuṇa: 6.51.1, 7.61.1, 7.63.1, etc.; of Indra, 7.98.6 *yát páśyasi cákṣasā sūryasya* 'when you see with the eye of the sun'; and of the gods in general,

7.76.1 and 7.77.3 *devānām cákṣuh*. The sun and moon appear as 'the two immortal eyes of heaven': 1.72.10 *divó . . . akṣī amṛtā*.

'*Mainstay of the sky*' (pp. 47–8). Nine passages are quoted in support, and it cannot be doubted that Soma is described as the 'supporter of the sky', *divó dhartā* and similar expressions. Wasson here writes, 'What poet could conceive of a creeper, a climber, any vine—some species of *Sarcostemma* or *Ephedra*—as "mainstay of the sky", "foundation of the earth"? But the sturdy stanchion with its resplendent capital that is the fly-agaric lends itself well to this poetic conceit'. For my part, I find the idea almost comic that the Vedic poets should have seen in this little mushroom a model of the sky supported by a mighty pillar—unless they were indeed suffering severe hallucinatory effects of *soma*-drinking. The natural explanation here, as before, is that Soma is a great god, and one of the regular functions of the great gods is to prop up the sky, or to prop asunder heaven and earth. This is so familiar that it need be illustrated only by a few out of numerous examples: 6.70.1 *dyāvāprthivī várūṇasya dhármanā víṣkabhite* 'heaven and earth propped asunder by the ordinance of Varuṇa'; 7.86.1 *ví yás tastāmbha ródasī cid urvī* '(Varuṇa) who propped asunder heaven and earth, wide as they are'; 8.41.10 *yá skambhēna ví ródasī . . . ádhārayat* '(Varuṇa) who held apart heaven and earth by a pillar'; 3.59.1 *mitró dādihāra prthivīm utá dyām* 'Mitra supports the earth and sky'; 1.154.1 *yó áskabhāyad úttaram sadhástham* '(Viṣṇu) who propped up the assembly-place (of the gods) on high'; 3.5.10 *úd astambhīt samídhā nákam* '(Agni) propped up the firmament by means of the sacrificial kindling-stick'; 2.12.2 *yó dyām ástabhnāt sá janāsa índrah* 'he who propped up the sky, O men, is Indra'. What more natural than that Soma should take his place in this august company?

'*The Filtres*' (pp. 51 ff.). Wasson cites two verses which mention three filters (pp. 54–5), quoted here with his English translation: 9.73.8 *ṛtásya gopá ná dábhāya sukrátus trí śá pavitrā hṛdy antár á dadhe* 'The Guardian of the *Rtá* [Soma] cannot be deceived, he of the good inspiring force; he carries three filtres inside his heart'; 9.97.55 *sám trí pavitrā vitatāny eṣy ánv ékam dhāvasi pūyāmānaḥ* 'Thou runnest through the three filtres stretched out, thou flowest the length, clarified'. For the second of these, the translation is misleading, depending as it does on Renou, but omitting the suppletions; 'Tu parcours les trois filtres (déjà) tendus; tu coules le long de (chac)un (d'eux, une fois) clarifié'. As so often, Sāyaṇa is not very helpful: *trīṇi pavitrāṇi agnivāyusūryāt-makāni . . . kim ca pūyāmānaḥ tvam ekam avivālakṛtaṁ pavitrām anu dhāvasi*. Agni, Vāyu, and Sūrya here seem to be only a guess. But his view that the actual filter of sheep's wool is different from the other three may be correct, and Renou's '(chac)un' seems unjustified. Thus, 'You unite with the three stretched-out filters; (but) in purifying yourself you run the length of the one (namely, the filter of wool)'. Geldner's note on the verse is partly based on Sāyaṇa: 'Die drei sind die mystischen, im Herzen befindlichen (3,26,8); die eine die wirkliche aus Schafhaaren gemachte'. The three *pavitrās* in 3.26.8 are

apparently those factors in the heart or mind (cf. *hr̥dy āntār* in 9.73.8) which ‘purify the inspired hymn in the heart of the poet’: *tribhiḥ pavitrair āpupod dhy ārkām hr̥dā matim jyōtir ānu prajānān* (here of Agni). These ‘purifiers of poetic inspiration’ (plural, though not specified as three) appear elsewhere: 3.1.5 *krātum punānāḥ kavibhiḥ pavitraiḥ* ‘(Agni) purifying his inspiration by means of the poets, the purifiers’ (or, following Geldner’s suggestion, ‘by means of the poetic purifiers’); 3.8.5 *punānti dhīrā apāso manīṣā*; 7.85.1 *punīṣe vām arakṣāsam manīṣām sōmam indrāya vāruṇāya jūhvat*. Soma is himself a *kavi*, and it is possible that in 9.73.8 he might have placed ‘three filters in his heart’; but in the light of 3.26.8 and the other passages just quoted, a more probable interpretation may be: ‘he has placed the three purifiers (of poetic inspiration) in the heart (of the poet)’.

Since multiple applications and nuances of words are common in the RV, this proposal does not contradict the only certain aspect of Wasson’s ‘first filtre’, namely, that the hymns on occasion conceive a ‘heavenly filter’ for Soma. This, however, is easily explained by the axiomatic sacerdotal assumption of parallelism between ritual and cosmic events. Thus, 9.66.5 *tāva śukrāso arcāyo divās pr̥sthē vi tanvate pavitraṃ soma dhāmabhiḥ*, translated by Wasson (p. 52) as, ‘Thy clear rays spread over the back of heaven, the filtre, O Soma, . . .’. Renou, however, was probably on the right track when, in view of *dhāmabhiḥ*, he assumed ellipsis, and translated as ‘(atteignant) le filtre, ô soma, avec (tes) formes (successives)’. The four *dhāmans* of 9.96.18–19 and similar passages quoted above suggest that the verse condenses into a few words the heavenly manifestations and the *dhāmans* at the actual ceremony.

Wasson’s ‘first filtre’ (p. 52) is that ‘where the sun’s rays, escorting Soma down from the sky, are caught and held on the fiery back of heaven (= the pileus of the fly-agaric)’. Except for the equation in brackets, this is a possible explanation, although there is no certainty that the filter in question is one of the *trī pavitrā* in the two verses quoted above. The ‘second filtre’ is easily accepted as the ritual woollen filter.

Wasson’s interpretation of his ‘third filtre’ is more difficult. He assumes that in the rite the parts of Indra and Vāyu are performed by the priests impersonating the gods, as in a ritual drama—hence his quotation-marks. He writes (p. 55), ‘Let us assume the fly-agaric surmise is well founded. Then the third filtre becomes clear: the Soma juice that is drunk by “Indra” and “Vāyu” in the course of the liturgy is filtered in their organisms and issues forth as sparkling yellow urine, retaining its inebriating virtue but having been purged of its nauseating properties’.

The first passage quoted in support is 9.70.10, but with the omission of the first *pāda*, which is essential for the meaning. The first half of the stanza is: *hitō nā sāptir abhi vājam arṣēndrasyendo jathāram ā pavasva*. By omitting half of this, Wasson gives us the translation, ‘Purify thyself in Indra’s stomach, O juice!’. Here he is following Renou, ‘clarifie toi dans le ventre d’Indra!’. But this is surely a mistake, and an unfortunate one, since it has led Wasson to

believe that a further purification or filtering takes place within the stomach of Indra. Elsewhere, it is clear that Indra consumes the already filtered juice. The sense here is rather: 'Like a horse impelled towards booty (in battle), flow, O soma-juice, into the belly of Indra: purify yourself'.

The other verse upon which Wasson relies to establish 'Soma urine' in relation to the 'third filtre' is 9.63.7 (p. 56): 'Is not the following verse imbued with new meaning, in the light of my interpretation—the *human waters* being put into movement ?

Clarify thou thyself by that stream by which thou madest the sun to shine,
putting into movement the human waters !

ayā pavasva dhārayā yāyā sūryam ārocayaḥ
hinvāno mānuṣīr apāh'

Interpreted so, the verse is certainly 'imbued with new meaning', but a wrong meaning. There is no reference here to human urine: the contrast is between the heavenly waters in the first part of the verse, and the 'waters of mankind' in the latter part—the rains and the rivers with which Soma and Indra are so closely associated. The same *āpo mānuṣīh* are apostrophized in 6.50.7. Comparable is the contrast between heavenly and earthly races in 7.4.1 *daivyāni mānuṣā janāṃsi*.

In all the other verses quoted as illustrations (pp. 56 ff.)—and they are many—the talk is exclusively about the ingestion by Indra of the already filtered soma-juice, which enters into his heart, or his belly or entrails. There is no further filtering within the body of Indra: there is no hint in the RV that Indra ever excreted the soma.

'*Tongue of the Way*' (p. 58). We are told that the cap of the fly-agaric, 'the full blown red tongue, held the clue to the little mystery' of the phrase *ṛtasya jīhvā* in 9.75.2. But Wasson himself remarks that 'the poet continues to apostrophize Soma as the source of eloquence'. There is no mystery here: see the discussion earlier in this article on *kavi* and *kāvya*. It is superfluous to seek a further explanation by showing a photograph of a slightly elongated and twisted fly-agaric (plate XIII).

To conclude this section in lighter vein, I cannot refrain from mentioning *sahāsrabhṛṣṭi*-, which Wasson (p. 52) considers to refer to the thousand studs, i.e., the white patches on the cap of the fly-agaric. He is aware that *bhṛṣṭi* 'is used for the knobs or studs on a cudgel, as on the cudgel of Indra. With his thousand knobs or studs Soma conquers potent fame: so say the hymns in two places'. In fact, the half-verse in question is the same in both hymns, except that in 9.83.5 the verbs are in the second person, in 9.86.40 in the third. The conceit is therefore isolated. It is highly probable that in these two verses in book 9 Soma is for the time being thought of as Indra's weapon:

9.86.40 *rājā pavītraratho vājam āruhat*
 sahāsrabhṛṣṭir jayati śrávo brhāt

'As king with the filter as chariot, he has mounted upon the booty of war: as

the thousand-studded weapon (of Indra), he conquers high renown'. This seems satisfactory, since that which is *sahásrabhṛṣṭi* is regularly the thunderbolt (*vajra*) or war-club (*vadhā*) of Indra, fashioned for him by Tvaṣṭar, and used by him (admittedly with somic inspiration) in his battle against Vṛtra: 1.80.12; 1.85.9; 5.34.2; 6.17.10; also 1.52.15 *bhṛṣṭimātā vadhéna*. How charming is the idea of the tiny fly-agaric as the mighty weapon of the great god Indra!

As one who has no specialist qualifications in chemistry or pharmacology, I can mention only very briefly the problems raised by Wasson's theory for human physiology. In dealing with the use of the fly-agaric in Siberia, Wasson quotes frankly many sources which mention the emetic properties of *Amanita muscaria*. Here we can only conjecture that repeated small doses might acclimatize the subject, and result in a tolerance to the nausea; but obviously scientific investigation is necessary. Even more serious for the Soma theory is the repeated mention in the 'Exhibits' of the coma induced by the fly-agaric: see for example p. 279 ('an ecstatic stupor'); p. 315 ('transports himself into a state of unconsciousness'); p. 248 mentions vomiting and convulsions. Especially disturbing is p. 306, where 'in a stupor from three sun-dried agarics, our Hero 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'. Wasson does not make it at all clear in what way this statement differs in respect of the two versions of the same Vogul tale on pp. 303 and 306. Even with this uncertainty, the coma caused by the fly-agaric is too widely attested to be ignored. Here, it would seem, is a plant whose effects are totally unsuitable to stimulate Indra and human warriors for battle. The other reports that the fly-agaric enables men to carry out great feats of strength, and produces increased strength and agility (pp. 159, 240, 273-4, etc.) are hardly compensation for the disadvantages of stupor and unconsciousness.

Wasson (p. 61, n.) refers to, but does not quote, an article by Bowden, Drysdale, and Mogey.³¹ This article, not unexpectedly, dealt with the effects of the plant on flies. From it the authors extracted muscarine, acetylcholine, and a carboxylic acid which they provisionally identified with the ibotenic acid³² earlier extracted from *Amanita muscaria*, *A. strobiliformis*, and *A. pantherina* by Takemoto, Nakajima and Yokobe.³³ It would appear, however, that it was this last-mentioned constituent which produced a temporary state of unconsciousness in flies. Since it is most probable that the muscarine is the chief nauseating agent in *A. muscaria*, the prospects for this line of pharmacological research are

³¹ K. Bowden, A. C. Drysdale, and G. A. Mogey, 'Constituents of *Amanita muscaria*', *Nature*, CCVI, 4991, 1965, 1359-60.

³² Named from Jap. *ibo-tengu-take* (presumably 'verrucose *Amanita*') = *A. strobiliformis*. *A. muscaria* is *beni-tengu-take* 'red *Amanita*'. The use of *tengu-take* 'goblin-mushroom' for *Amanita* may be of interest for vernacular fungal terminology. [The discussion of 'muscarine-effects' here and on p. 361 may now require modification: see Addendum to footnote on p. 362.]

³³ *Journal of the Pharmaceutical Society of Japan*, LXXXIV, 1964, 1232.

not very promising for Wasson's Soma theory. It is nevertheless encouraging that Wasson reports (p. 202) that work on the chemistry and pharmacology of the fly-agaric is in progress in Zürich and in Japan.

One perplexing factor in the situation is that the modern Zoroastrians identify the Haoma-plant as a species of *Ephedra*.³⁴ This naturally does not prove that the latter was the original plant. So far as I know, it has never been used as a substitute for Soma, and all the references to it in modern discussions of the Indian Soma appear to have been derived from Iranian information (see Dr. O'Flaherty's chapter in Wasson's book). Even if an *Ephedra* might have been the original Soma—and I must make it clear that I am not suggesting that this was so—it would probably be impossible to identify the species.³⁵ The alkaloid ephedrine (similar in its physiological action to adrenaline—in the United States called epinephrine) was isolated by Yamanashi in 1885 from *Ephedra sinica* Stapf. The latter, *ma-huang* 麻黃, Jap. *ma-ō*, has been used as a medicinal herb in China since well before the Christian era. Ephedrine 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. To list only the more salient effects on the mammalian organism, muscarine causes contraction of the pupils, depression of blood-pressure, cardiac slowing, increased peristalsis, and bronchial constriction: ephedrine causes dilation of the pupils, increase of blood-pressure, increase of heart rate, and relaxation of the muscles of the bronchi and gastrointestinal tract.³⁶ If the original Soma had been the fly-agaric, it would be extraordinary that the Iranians should have chosen as a substitute a plant which might have had entirely opposite effects.

To be fair, it must be added that not all the species of *Ephedra* contain the alkaloid; and of those which do, its concentration may vary considerably in relation to climatic conditions and geographical distribution. It would seem that much work remains to be done in botany, chemistry, and pharmacology before it will be sensible to make a further attack on the problem of the botanical identity of the Soma-plant.

Wasson writes (p. 69), 'India is a land where the incredible sometimes comes true, and I should be delighted, but not altogether surprised, to discover that there are still circles privy to the knowledge of the true Soma'. Few of us would now be surprised; and it may well happen that at some time in the future some Brahman will 'reveal' the secret that the Soma-plant was a red mushroom.

³⁴ Mary Boyce, 'Haoma, priest of the sacrifice', in M. Boyce and I. Gershevitch (ed.), *W. B. Henning memorial volume*, London, 1970, 62. The evidence quoted (*ibid.*, p. 64, n. 26) from Stein, *BSOS*, vi, 2, 1931, 502 ff., suggests, though it does not prove, that an *Ephedra* was already in use among the Central Asian Iranians in the fourth century A.D.—and not necessarily as Haoma.

³⁵ H. H. W. Pearson, *Gnetales*, Cambridge, 1929 (but written before 1916), lists nine or ten species whose geographical distribution might make them possible candidates; but his information is very imprecise. J. D. Hooker, *Flora of British India*, 1875–97 (information long out of date), v, 641, 863, found it extremely difficult to differentiate many of the species.

³⁶ Louis S. Goodman and Alfred Gilman, *The pharmacological basis of therapeutics*, second ed., New York, 1956.

But Wasson's book has now been published. If any such 'tradition' does come to be disclosed, we shall never know whether it has been fabricated from the book.

I cannot close without an expression of admiration for the enormous labour in scholarly research which Mr. Wasson has devoted to the preparation of this book,³⁷ and of gratitude for the great quantity of fascinating materials which he has placed before us. It is therefore with all the more regret that I find myself unable to accept that he has proved his theory that the original Vedic Soma was *Amanita muscaria*.

³⁷ See now also the review by F. B. J. Kuiper, *Indo-Iranian Journal*, XII, 4, 1970, 279-85, with further comments by R. G. Wasson, *ibid.*, 286-98, published after the present article had been sent for printing.

[Addendum. Mr. Wasson has very kindly sent me a copy of an article by P. Catalfomo and C. H. Eugster, '*Amanita muscaria*: present understanding of its chemistry', *Bulletin on Narcotics*, XXII, 4, 1970, 34-41. The authors show that 'the total muscarine content of *A. muscaria* is extremely low (0.0002 per cent on a fresh weight basis)'. Thus, some of my remarks on pp. 360-1, in so far as they concern muscarine, are probably not relevant for the fly-agaric problem. Unfortunately, this information reached me only after the present article had been set in pages. The paragraphs in question could not be rewritten without undue expense and delay in printing; and I am grateful to the Editorial Board for permitting me this additional note. It should be clear, however, that the chief point of my argument still stands, namely, the nausea, vomiting, and coma caused by the fly-agaric, even if the chemical agents responsible for these effects are not yet definitely decided by pharmacologists.]