

ETHNOMYCOLOGICAL DATA FROM SIBERIA AND NORTH-EAST ASIA ON THE EFFECT OF *AMANITA MUSCARIA*

MARET SAAR

Laboratory of Mycology, Institute of Zoology and Botany, Estonian Academy of Sciences (Estonia)

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Summary

The paper includes literary data on the use of *Amanita muscaria* in Siberia and North-East Asia as well as information collected from ethnographers investigating these areas during the past decades. A survey is given on the cases and rules of *Amanita muscaria* consumption and the ways of its administration. The peoples having the tradition of *Amanita muscaria* consumption were aware of its different psychotropic qualities and were able to use for several purposes. The fungus has been used by them as a psychostimulant having a simultaneous effect on several psychic functions.

Introduction

The biochemical composition and psychotropic effect of *Amanita muscaria* (Fr.) Pers. ex Hook. are not quite clear (Singer, 1978; Flammer, 1985). For their proper elucidation we might also take into consideration the data originating from animist-shamanist cultures as they are different from those obtained with the help of experiments performed on volunteers and those collected on the basis of casual intoxications.

The following abbreviations are used in the paper: kh, the Khanty; i, the Itelmen; K, Kamchatka; k, the Koryak; AM, *Amanita muscaria*; m, the Mansi; fn, the Forest Nenets; n, the Nganasan; s, the Selkup; Ch, Chukotka; ch, the Chukchi.

Materials

Sources

The paper is based on the following data: (1) literary information from groups of people who have lived on the territories with customary AM consumption from the 17th century up to the first third of the 20th century;

most of it has been represented by Wasson (1968) whose references have been used by the author of the present paper; (2) both oral and written messages from ethnographers, folklorists and archaeologists working on these territories at present; (3) information collected by the author from the Khanty of the Great Yugan (a tributary of the Ob River) in 1987 and from an Estonian who worked as a reindeer herdsman with the Chukchi at the beginning of the 1970s.

Regions of AM consumption and nations involved

Different animist-shamanist cultures of the Asian part of the U.S.S.R. have had different relations to AM. In some cultures AM was regarded as a special object, a supernatural being whose action or influence could be used by man in his particular interests, in others it was not paid any attention whatsoever.

Cultures with customary AM consumption spread in two regions. One of them was West Siberia together with the Taimyr peninsula. AM consumption has been observed among the Khanty (Kamieński Dłuzyk, 1874; Georgi, 1780; Patkanov, 1897; Dunin-Gorkavich, 1904; Karjalainen, 1927; Shatilov, 1931; Yuri Simchenko, 1987; personal communication; Maret Saar, 1987, field work data), the Mansi (Dunin-Gorkavich, 1904; Karjalainen, 1927; Kannisto, 1958), the Forest Nenets (Lehtisalo, 1924), the Selkup (Shatilov, 1927; Donner, 1933), the Nganasan (Yuri Simchenko, 1987), information about the archives of the missionaries (personal communication), and the Ket (Donner, 1933). At the present time there are no data on this phenomenon in this region (kh: Vladislav Kulemzin, Nadezhda Lukina, Edgar Saar, Zoya Sokolova, 1987, all in personal communications; m: Zoya Sokolova, 1987, personal communication; fn: Vladimir Vassilyev, 1987, personal communication; n: Yuri Simchenko, 1987, personal communication). In the regions with the Khanty population where the phenomenon was the most widespread in the past, however, we may assume its episodic existence even now (Maret Saar, 1987, field work data).

The other region included roughly all the continent east of the meridian passing through the mouth of the Kolyma River together with the Kamchatka peninsula. All the nations inhabiting that territory — the Chukchi, the Koryak, the Itelmen, the Eskimoes, the Russians living along the Kolyma for centuries, the Chuvanians*, the Yukagir, the Even — had the similar idea of AM as a supernatural being (Yuri Simchenko, 1987, personal communication). At present the custom of AM consumption is still alive there (Yelena Batyanova, Vladimir Lebedev, Yuri Simchenko, 1987, all in personal communications).

*One of the Yukagir tribes, partly assimilated with the Chukchi and the Koryak.

The relation of AM consumption to the religious position of the consumers and to their sex

In different cultures, sometimes even within one culture, there have been differences depending on the sex and religious standing of the consumers.

With many peoples AM has been used only by persons having a special relation to religion. This is the case with the Forest Nenets (Lehtisalo, 1924); the Selkup (Donner, 1933) and the Ket (Donner, 1933). With most peoples, however, the use of AM was not confined to a certain class and it was also used by ordinary people. Here belong the Chukchi (Dittmar, 1900; Johelson, 1905, 1908; Bogoraz, 1904–1909; and Vladimir Lebedev, Yuri Simchenko, 1987, both in personal communications), the Koryak (Strahlenberg, 1736; Krashennikov, 1755; Steller, 1774; Langsdorf, 1809; Erman, 1833–1848; Maydell, 1893; Dittmar, 1900; Slyunin, 1900; Enderli, 1903; Johelson, 1905, 1908; Bogoraz, 1904–1909; Bergman, 1926; and Yelena Batyanova, Vladimir Lebedev, Yuri Simchenko, 1987, all in personal communications), the Yukagir (Steller, 1774; Johelson, 1905, 1908; and Yuri Simchenko, 1987, personal communication), the Itelmen (Krashennikov, 1755; Steller, 1774; Langsdorf, 1809; Erman, 1833–1848; Dittmar, 1900; Johelson, 1905, 1908; Bogoraz, 1904–1909; and Yuri Simchenko, 1987, personal communication), the Chuvanians (Yuri Simchenko, 1987, personal communication), and the Eskimoes (Yuri Simchenko, 1987, personal communication). The Khanty (Karjalainen, 1927; Shatilov, 1931; and Yuri Simchenko, 1987, personal communication; Maret Saar, 1987, field work data) and the Mansi (Dunin-Gorkavich, 1904; Karjalainen, 1927; Kannisto, 1958) have a few regional differences. Detailed data about the Nganasan are lacking.

In order to prevent erroneous opinions of the significance of AM in magic rites we must state that AM consumption in them was not obligatory. AM was used only by some magicians and not in all rites, while the magicians who could do without AM were considered stronger (Yuri Simchenko, 1987, personal communication).

The sex of a consumer of AM was also important when performing some sacred procedures by an ordinary member of the community.

Usage

AM has been consumed on several different occasions. They can be divided into four groups: sacred and magic activities, recital of epics, work and physical effort, narcotic purposes.

Sacred and magic activities

The use of AM has been reported in connection with the following activities: communication with the souls of the dead (ch: Bogoraz, 1939; K, Ch: Yuri Simchenko, 1987, personal communication), communication with spirits (kh: Patkanov, 1897; Karjalainen, 1927; Shatilov, 1931; m: Karjalainen, 1927;

Chernetsov, 1935; k: Johelson, 1905, 1908; Ch, K: Yuri Simchenko, 1987, personal communication), treatment of diseases (kh: Karjalainen, 1927; Shatilov, 1931), giving a name to a new-born child (ch, k: Vladimir Lebedev, Yuri Simchenko, 1987, both in personal communications), making clear the cause of a dangerous situation and finding ways to overcome it (kh: Karjalainen, 1927; Maret Saar, 1987, field work data; m: Chernetsov, 1935; s: Shatilov, 1927; fn: Lehtisalo, 1924; k: Johelson, 1905, 1908), interpretation of dreams (k: Johelson, 1905, 1908), prediction and fortune-telling (kh: Karjalainen, 1927; ch: Vladimir Lebedev, 1987, personal communication; k: Johelson, 1905, 1908; Kosven, 1962), foreseeing of the future (k: Enderli, 1903; ch: Bogoraz, 1904—1909), seeing of the past (ch: Vladimir Lebedev, 1987, personal communication), visiting of different worlds (k: Enderli, 1903; Johelson, 1905, 1908), flights over the earth (Ch, K: Yuri Simchenko, 1987, personal communication).

According to the world outlook intertwined with religious and magic elements the changes in the world of people are always connected with those in the world of supernatural beings. Man can influence the events of his life working upon these beings. To do this, he must know first whom he has to affect, and then act properly on the basis of right information. In complicated situations and crises it may happen that the information obtained by an ordinary member of the society proves insufficient or he is not able to influence supranormal beings. To enter into the world of the latter and communicate with mighty beings there is the privilege of the persons belonging to the highest sacred rank in the society*. Such people can free one of their souls from the body, send it to the world of supernatural beings, let it act there in the required manner and then bring it back successfully**. The necessary information about people as well as the supranormal world is collected at the initial stage of the procedure, using thereby the aid of spirits coming from the supernatural world (Siikala, 1978). It is characteristic of the procedures that AM is used at the beginning of the whole course of activities. Often the person involved has a sleep after consuming AM and starts influencing the supranormal world only after he has woken up.

Consequently, the process of communicating the world of supernatural beings is diverse and it has a number of stages. There are three kinds of opinions as to which aspect should be stressed with the help of AM at one or another stage.

*At the initial stage of animism any person was allowed to contact the supranormal world. Later this activity became the privilege of special persons (the shamans) whose soul was able to leave the body without doing any harm to the master (Kulemzin, 1984). In the investigated regions there exist world outlooks hardly differing from those characteristic of the initial stages of animism (e.g. the Koryak, the Chukchi); nevertheless, we also came across those of developed ones (e.g. the Khanty, the Mansi).

**"Contacting the spirit world is not only difficult, it is also dangerous. In order to help his band of supporters at critical points in their lives the shaman places his own well-being and even his life — as shamans themselves often say — at stake" (Siikala, 1978).

(1) In the opinion of Siikala, AM is a means of amplifying the rhythmical stimulation of changes in the conscious mind of the shaman*.

(2) Another kind of opinion might be contemplated from the point of view of psychology as "the effect of AM on information processing".

In the world outlook of both regions of AM consumption the fungus is connected with clairvoyance and information obtained from spirits. The typical explanations of the phenomenon are as follows: the fungus brings about a special state in which the consumer "knows everything", e.g., who has stolen something from him, or deceived him, etc. (s: Shatilov, 1927); it helps to understand the language of the spirits (m: Chernetsov, 1935); it has the power, when necessary, to predict the future to the person has eaten it (k: Enderli, 1903; Kosven, 1962, referred according to Novik**); it tells every man, even if he were not a shaman, what aided him when he was sick, or explains a dream to him, or shows him the upper world or the underground world[†]), or foretells what can happen to him (k: Johelson, 1905, 1908); it tells people the cause of the evil, e.g. when a man or an animal has got lost or when somebody is ill (kh: Maret Saar, 1987, field work data); it gives an answer to a question, e.g. how to cure a sick person (fn: Lehtisalo, 1924). According to the Khanty, AM is the only spirit able to predict something (Vladislav Kulemzin, 1987, personal communication).

Information is obtained at the time of hallucinations or dreams. Their course and aim is different in every region but the common trait of all is the appearance of anthropomorphous spirits, the so-called AM-manikins[‡]. They answer the questions asked by the AM consumer (kh: Karjalainen, 1927; Maret Saar, 1987, field work data) and give him information about the problem he is interested in. This is done singing (kh: Karjalainen, 1927) or in the form of a narrative (fn: Lehtisalo, 1924). They take the person by the hand and lead him through the whole world, showing him various things, sometimes taking him even to the world of the dead (ch: Bogoraz, 1904–1909); they show him the future and the past (k: Johelson, 1905, 1908).

*According to Siikala (1978) "the framework of the shaman's technique of ecstasy is similar to the basic psychic mechanism on which hypnosis is founded; this mechanism is undoubtedly common to all goal-oriented trace behaviour. . . The mental process of the trace induction stage can be regarded as a gradual deeping of role-taking directed at the supranormal. . . Mechanical means of stimulating the nervous system are rhythmical music, singing, dancing and drugs. . . The use of hallucinogens and other such intoxicants is not a vital element of trance technique in any part of Siberia. . . The shaman's altered state of consciousness comes into being as generalized reality orientation disappears along with an increase in the intensity of the rhythmical, gradually accelerating sensory stimulus and role-taking directed at the supranormal.

**Dikov, 1984.

[†]According to the Koryak and Chukchi they are, respectively, the future and the past.

[‡]The conception of AM-spirits as beings of the supranormal world, anthropomorphous to a greater or lesser extent, is common in both regions of AM consumption. Probably it goes back to time immemorial (Dikov, 1971; Devlet, 1975). Petroglyphs in Chukotka depicting AM-manikins are supposed to have belonged to the ancestors of the Chukchi, assimilating the proto-Eskimos (Dikov, 1971).

Information is given to the listeners at the time of dreams (kh: Maret Saar, 1987, field work data) or hallucinations (kh: Karjalainen, 1927), sometimes, however, after waking up (kh: Karjalainen, 1927; fn: Lehtisalo, 1924).

The essence and distribution of AM-questioning* on the territory inhabited by the Khanty has been treated by Karjalainen (1927). In his opinion the fungus has been consumed to call forth dreams that would give information and would enable foretelling the future.

Some data are now presented on the Khanty of the Yugan (Maret Saar, 1987, field work data), originating from two old clans whose settlements are situated in the middle reaches of the river, about 200 km from each other. The author's informers were Yakov Petrovich Kuplandeyev (b. 1959) from one family and the Ryskin brothers, Yefim Mikhailovich (b. 1939) and Ivan Mikhailovich (b. 1941) from the other. They all regarded the phenomenon of AM-questioning, in principle, from the same angle. They called it clairvoyance or a fit of second sight.

"AM was used to get inebriation as well as to call forth a fit of second sight for the purpose of learning something definite, for instance: what ails you, where the lost thing, animal or person is and whether the latter are dead or alive. To evoke a fit of second sight, AM was consumed by wise men" (the explanation of Yakov Kuplandeyev).

"This fungus is used to bring about a spell of second sight. For instance, when a child is ill, the parents want to know whether it is a scourge of god or something else. The father of the child eats the AM to evoke such a spell. He falls asleep and in his dream sees manikins as tall as half an average man (the informer stood up and showed to his waist-belt). The manikins ask the man why he has eaten AM. The man explains his wish and the dwarfs give the answer. For some time the man sleeps without dreams and then the manikins appear once more. The man may now ask another question. During one dream the dwarfs may appear several times, each time giving a little more information. To the onlookers it seems as if the man were asleep, only sometimes he speaks in a loud voice (i.e. when he is talking to the manikins). At last the man falls sound asleep and by the time of his waking up the fit of second sight has passed. Only the pileus of the fungus is eaten**. For the purpose of clairvoyance AM is consumed only by men. The following day the consumer may have attacks of sickness and vomiting. If the manikins do not appear, the explanatory vision will not be obtained." Yefim Ryskin who told this had not eaten AM himself. His information was based on his father's experience.

"AM was used when some misfortune happened. People then appealed to a wise man (the Khanty have a special name for him) for help. If there was no wise man in the neighbourhood, people had to try to learn the secret

*The term used by Karjalainen.

**The Khanty of the Yugan eat only the pileus of AM, the part where the stipe is attached, however, is not eaten.

themselves. Only a man was allowed to consume AM. If nothing came of it, one had to look for a wise man after all." (Ivan Ryskin's explanation).

The questioning of the fungus may sometimes fail, the AM-manikins may not turn up (kh: Maret Saar, 1987, field work data) or they may take the man to other countries and places without giving necessary data on the required problem (kh: Karjalainen, 1927).

AM consumption by the shaman is looked upon as the creation of an assistant. It is perceived like the reception of AM spirit into himself (kh: Karjalainen, 1927), whereas the shaman seems to surrender to an external pressure:

"The shaman ('vorozhey') does not eat AM because he wishes to. He is made to eat it by the AM spirit who speaks and acts through him" (kh: Vladislav Kulemzin, 1987, personal communication).

When forwarding the information to the listeners, the shaman feels as if he were only a means in the hands of AM spirit:

"The subject of the old woman's (a woman shaman — M.S.) song was not she herself but 'the spirit of the fly-agaric'" (kh: Karjalainen, 1927).

"When a vorozhey eats AM, then he, the vorozhey, sings. He who sings is not he, the vorozhey, but AM" (kh: Vladislav Kulemzin, 1987, personal communication).

The poetic nature of a Khanty song written down by Heiki Silvet (1988, personal communication) refers to the positive emotional state of the shaman after getting information. The song represents the shaman's appeal to AM as a mediator in communicating with superior beings.

Oh you little gold-stiped fly-agaric, chao-chao-chao,
Such tidings you brought me, chao-chao-chao,
Little patterned-stiped fly-agaric, chao-chao-chao,
Many messages, many words you have, chao-chao-chao,
(An unknown word) is placed on golden grass, chao-chao-chao,
Little duckling, little duck, chao-chao-chao,
One half of you walks on the water, chao-chao-chao,
The other half of you walks on the ground, chao-chao-chao,
Pulling snare, pulling string, chao-chao-chao,
So one must rock, chao-chao-chao,
You are among fly-agarics a little fly-agaric.

(3) According to the Khanty AM is also a means of checking the shaman's fear (of increasing his courage) at the central stage of the procedure, i.e. the stage of communicating with the supranormal world.

"... a bear eats AM during the rutting season in order 'not to fear', and the informer has compared it in this sense with a shaman who eats AM not only for foretelling the future after having dreamed frightening events but also in order to encourage himself before meeting several spirits" (kh: Kulemzin, 1948).

Recital of epics

In animist-shamanist cultures as well as in pre-literary cultures oral

recital of folklore was a widespread feature. Special performers acted for this purpose. Among them AM consumption has been observed to facilitate their activities.

"To inspire himself, a singer (performer of heroic epic songs — M.S.) would eat a few AM before starting to sing...: under their influence he would get simply mad... Then he would sing heroic epics in a ferocious voice all the night long, including even those which seem to have been forgotten long ago; in the morning he would fall on the plank-bed, powerless. The listeners, indifferent to his state, are content to have heard the songs of their fathers in such an emotional presentation" (kh: Patkanov, 1891).

"On the Vasyugan there were special persons, called *pankal-ku*. A *pankal-ku* soaked AM in warm water and drank the extract which had the effect of a soporific and a narcotic. The people present gathered round the sleeping *pankal-ku* and listened to his dream that he was telling in delirium" (kh: Kulemzin, 1976).

"Once I asked a Reindeer Koryak, who was reputed to be an excellent singer, to sing into the phonograph. Several times he attempted, but without success... After eating two fungi, he began to sing in a loud voice, gesticulating with his hands" (k: Johelson, 1905, 1908).

Work and physical exertions

Here belongs the cases where a man increases the resistance of his organism to great physical strain and skill of his movements: pursuit of animals in a canoe (Ch: Bogoraz, 1904—1909), haymaking (K: Erman, 1833—1848), pulling boats with ropes (kh: Yuri Simchenko, 1987, personal communication), carrying heavy loads over long distances (K: Langsdorf, 1809), long walking tours (a Cossack: Krashennnikov, 1755; K: Vladimir Lebedev, 1987, personal communication; Ch: Bogoraz, 1904—1909) or running (Ch, T: Yuri Simchenko, 1987, personal communication).

In some cases attention has been drawn to the circumstance that such a way of resisting physical strain did not seem to do any harm to the health. "In harvesting hay I can do the work of three men from morning to nightfall without any trouble" (K: Erman, 1833—1848). — "An old woman runs 30 km and does not die"; (Ch: Yuri Simchenko, 1987, personal communication). It seemed to remove all physical and psychic inconveniences: "...he would lay aside his snow-shoes and walk through the deep snow hour after hour...for the mere pleasure of exercise, and without any feeling of fatigue" (Ch: Bogoraz, 1904—1909). — "Under the influence of the fungus it is a trifle to walk 50 km" (K: Vladimir Lebedev, 1987, personal communication). Information about such an effect of AM has been gathered during two centuries and a half already and the existence of this effect of the fungus has also been stressed by the ethnographers Vladimir Lebedev and Yuri Simchenko who are at present studying the problem of AM consumption.

Narcotic purposes

This group includes cases where people thought it necessary to call forth

high spirits. Such were, for instance, feasts on the occasion of neighbours' visits, during weddings or after successful hunting tours where most of the time was passed eating, dancing and singing (K: Krasheninnikov, 1755). Sometimes it also happened in everyday life that pleasant psychic state was induced alone or in company (K: Dittmar, 1897; Ch: Yelena Batyanova, 1987, personal communication; K, Ch: Vladimir Lebedev, Yuri Simchenko, 1987, both in personal communications; kh: Maret Saar, 1987, field work data) and then the time was spent in activities (K: Langsdorf, 1809) or whiled away quietly on one's own (k: Dittmar, 1900; ch: Dittmar, 1900; and Ülo Siimets, 1987, personal communication), or doing both this and that (k: Johelson, 1905, 1908). The best and most pleasant experiences are said to have been gained when the effect of AM began to show itself during sleep (i: Erman, 1833—1848; k: Erman, 1833—1848; Enderli, 1903; ch: Enderli, 1903). Therefore, it was customary to go to bed after consuming AM (i, k: Erman, 1833—1848; K, Ch: Yuri Simchenko, 1987, personal communication).

The expected psychic effect became apparent first and foremost as a positive frame of mind: pleasant feelings (K: Krasheninnikov, 1755; Langsdorf, 1809; Dittmar, 1900; i: Erman, 1833—1848; k: Erman, 1833—1848; Maydell, 1893; ch, k: Bogoraz, 1904—1909; and Vladimir Lebedev, 1987, personal communication), gaiety, wit, humour (K: Krasheninnikov, 1755; k: Enderli, 1903; Bogoraz, 1904—1909; ch: Bogoraz, 1904—1909; s or kh on the Narym: Georgi, 1780), or, in addition to a euphoric state, pleasant visionary or auditory hallucinations (K: Krasheninnikov, 1755; Dittmar, 1900; i: Erman, 1833—1848; k: Erman, 1833—1848; Maydell, 1893; Johelson, 1905, 1908; ch, k: Bogoraz, 1904—1909; and Vladimir Lebedev, 1987, personal communication) and dreams (i: Erman, 1833—1848; k: Erman, 1833—1848; Slyunin, 1900).

An unexpected side-effect might appear in the form of the so-called AM spirit jokes. In hallucinations orders have been given sometimes to perform strange operations alien to common sense, their form being so imperative that they have been carried out to the letter, without question (K: Krasheninnikov, 1755; k, ch: Bogoraz, 1904—1909). At times the agaric eater was impelled to imitate the fungus (k, ch: Bogoraz, 1904—1909).

The depth of psychic changes varied: in some cases the person maintained contacts with his surroundings and could check his behaviour during the whole period when the influence of AM lasted, in others he lost all contacts and control of himself. Some people experienced both states during one spell of AM effect (k, ch: Bogoraz, 1904—1909).

Other conspicuous side-effects often mentioned by the investigators consisted in the magnification of surrounding objects (K: Krasheninnikov, 1755; k: Maydell, 1893; Slyunin, 1900; Johelson, 1905, 1908; Bogoraz, 1904—1909; ch: Mayden, 1893; Bogoraz, 1904—1909) as well as trembling or convulsions of extremities (K: Krasheninnikov, 1755; Langsdorf, 1809; k: Enderli, 1903; Johelson, 1905, 1908).

Attention should be drawn to the circumstance that in authentic sources no case has been observed where the behaviour of the native under the influence of the fungus has proved dangerous to himself or his companions,

but in most of them the positive nature of the psychic state caused by AM has been stressed.

We shall conclude with the case when the Russian ethnographer Vladimir Lebedev (1987, personal communication), during an expedition to the Chukchi, tried the effect of AM on himself.

"The effect was revealed in two hours. I was lying in a tent, talking with two men. At first the topic was interesting for me but, starting from a certain moment, I switched out and felt as if I were watching a widescreen film. The program was conducted by myself. I felt light and merry. At a certain point I resumed the conversation with my companions. Having again lost interest in it, I switched over to my 'film' at the spot where I had parted. I spent two hours in total under the influence of the fungi. During all that time I could wholly retain control of myself; my movements were smooth, I was in a lively and merry mood. I did not detect any side-effects concerning either my spirits or physical condition".

Periodical changes in the psychic state seem to be rather typical of the course of such enjoyments. There are also literary data that the contents of hallucinations as well as dreams could be induced by the person involved.

The use of AM to remove psychophysical fatigue can conventionally also be treated in this group.

"When a hunter goes alone to a far-away forest for a long time and gets tired there, that is to say, when his soul and body are tired out, he will eat dried AM and get kind of drunk. After that he will feel well again and can resume hunting" (kh: Maret Saar, 1987, field work data).

Factors essentially influencing the effect

There are two circumstances which have essential impact: the phase of development of the employed fruit body and the predisposition of the consumer.

Phase of development of the fruit body. The dependence of the AM effect on the phase of development of the fruit body is known in both regions of AM consumption and the problem is treated likewise. The effect of young fruit bodies, i.e. those having small and convex pilei, is regarded as stronger and more efficacious on people than that of older ones with big and flat pilei (kh: Karjalainen, 1927; fn: Lehtisalo, 1924; Ch, K: Yuri Simchenko, 1987, personal communication). The former are used to facilitate work and physical exertions, the latter prove to come in handy to evoke hallucinations or obtain a state similar to that caused by alcoholic drinks (ch: Vladimir Lebedev, 1987, personal communication). The ideas of the Itelmen to this effect have been summed up by Langsdorf (1809) as follows: "The smaller mushrooms, which are bright red and covered with many white warty protuberances, are said to be far stronger in narcotic power than the larger ones, which are pale red and have few white spots".

The Forest Nenets wise men ate mature mushrooms only (Lehtisalo, 1924).

Smaller fruit bodies are also more apt to bring about the desired effect.

"Big fungi are not so obedient as small ones, they may deceive; small fungi are stronger than the big ones but more submissive" (Ch, K: Yuri Simchenko, 1987, personal communication).

The size of the fruit bodies fit for use can be pictured by the following two pieces of information: "The pileus of the fungus must not be bigger than the hollow of the hand with crooked fingers" (kh: Maret Saar, 1987, field work data), "the size is variable, with diameters ranging from 1—1½ to 5—6 inches" (i: Langsdorf, 1809).

The disposition of the consumer. The disposition of the AM consumer functions on two levels. The attitude towards AM seems to be of paramount importance. It depends on the culture of the consumer. This is why the data obtained from experimenters with European manner of thought and from people who have suffered AM poisoning differ from those originating in animist-shamanist cultures. The existence of the proper attitude and the necessity to create it are essential features acknowledged also by the peoples consuming AM. "Only someone who is familiar with the origin of the fly-agaric can eat it 'with fortunate results', but if in his intoxication he does not see the mushroom spirits properly, they may kill him, or he may go astray in the dark" (fn: Lehtisalo, 1924).

The other level consists in materializing one's attitude towards AM by telling the fungus before eating what it is wanted for. This act is known in both regions, it is performed in all cases of AM consumption and cannot be omitted before each single event.

"AM must always be told (either in a loud voice or to oneself) the purpose of its use" (Ch, K: Yuri Simchenko, 1987, personal communication).

"Before eating the mushroom, the man recites over it certain definite formulas stating his wish to see the future, the wish will come true in his dream" (k: Enderli, 1903).

"If the magician eats of the mushroom, this always has a cultic significance, which is only natural, since by eating he creates helpers for himself" (kh, m: Karjalainen, 1927).

Administration of AM

Ways of administration. There have been about fifteen ways of administration. AM has been consumed raw, fried or cooked when fresh, dried, and in the form of an extract or decoction. Sometimes people have drunk the urine of a person intoxicated by AM or eaten the meat of intoxicated reindeer.

In the case of dried fungi either the whole fruit body was eaten, i.e., both the pileus and the stipe (ch, k: Yelena Batyanova, Vladimir Lebedev, 1987, both in personal communications) or the pileus only (kh: Karjalainen, 1927; and Maret Saar, 1987, field work data).

The fungus was swallowed unchewed and washed down with a gulp of water (K, Ch: Steller, 1774; Langsdorf, 1809; and Vladimir Lebedev, 1987, personal communication); the fungus was chewed and swallowed and then

washed down with a gulp of water (kh: Maret Saar, 1987, field work data; k: Maydell, 1893; ch: Bogoraz, 1904—1909); the fungus was masticated and only the saliva swallowed (k: Dittmar, 1900); the fungus was masticated by women but swallowed by men (k: Enderli, 1903; Bogoraz, 1904—1909). The latter way of administration has not been observed in 1970—1980, moreover, people lack any memory of it (Vladimir Lebedev, 1987, personal communication). At times the fungus was eaten with bread (kh: Karjalainen, 1927) or with either butter or fat (kh: Karjalainen, 1927). Sometimes it was eaten after it had been soaked in water for some time (kh: Maret Saar, 1987, field work data).

Dried fungi were also cooked in water for a short period of time and then the liquid drunk either pure (k: Strahlenberg, 1736; Ch, K: Vladimir Lebedev, 1987, personal communication) or mixed with fruit juice (the Russians in Chukotka and Kamchatka: Erman, 1833—1848).

In order to get an extract the fungi were soaked in fruit juice (K: Langsdorf, 1809) or hot water was poured over and left until they became swollen (Ch, K: Vladimir Lebedev, 1987, personal communication). It was known that bog bilberry *Vaccinium uliginosum* strengthened the effect of AM (K: Langsdorf, 1809). An extract was sometimes made with fire weed *Epilobium angustifolium* (K: Krasheninnikov, 1755). The remaining fungi were also swallowed (Ch, K: Yuri Simchenko, 1987, personal communication).

The urine of a person intoxicated by AM was drunk either pure (k: Strahlenberg, 1736; Krasheninnikov, 1755; Steller, 1774; Langsdorf, 1809; Maydell, 1893; Slyunin, 1900; Enderli, 1903; Johelson, 1905, 1908) or mixed with a beverage (k: Erman, 1833—1848).

The meat of reindeer intoxicated by AM had a psychotropic effect only when the animal was slaughtered in the intoxicated state (k: Steller, 1774; Erman, 1833—1848).

Fresh fungi were eaten either raw (kh or s of the Narym: Georgi, 1780; kh: Karjalainen, 1927) or they were fried or cooked and then eaten as sauce or soup (K: Langsdorf, 1809).

The most widespread manner of AM consumption in both regions was that of eating dried fungi (a review of references of such nature has been given by Wasson, 1968, pp. 153—154; K, Ch: Vladimir Lebedev, Yuri Simchenko, 1987, both in personal communications; kh: Maret Saar, 1987, field work data). It was partially due to the circumstance that drying was the best way of preserving the fungus. The main reason, however, was the idea that fresh fungi were very poisonous (k: Slyunin, 1900). "The poison is then more effective, and kills more speedily" (k: Johelson, 1905, 1908).

The water used to wash down the fungi has been characterized as fresh and cold (k: Slyunin, 1900; K: Steller, 1774; kh: Maret Saar, 1987). "The narcotic effect is also said to be heightened by the drinking of large quantities of cold water afterwards" (K: Langsdorf, 1809).

Dose. The dose depended on the physical state of the individual and could therefore differ greatly (K: Langsdorf, 1809). The maximum dose of dried

fungi, according to literary data, is 21 fruit bodies and even more (Patkanov, 1897). If we do not take into account these doubtful figures (Karjalainen, 1927), all the other literary data and the contemporary ones obtained in personal communication will remain in the interval from $\frac{1}{2}$ to 11 fruit bodies (K: Langsdorf, 1809; and Yuri Simchenko, 1987, personal communication; Ch: Yuri Simchenko, 1987, personal communication; ch: Bogoraz, 1904—1909; and Yelena Batyanova, Vladimir Lebedev, 1987, both in personal communications; k: Krasheninnikov, 1755; Erman, 1833—1848; Johelson, 1905, 1908; and Yelena Batyanova, Vladimir Lebedev, 1987, both in personal communications; i: Krasheninnikov, 1755; fn: Lehtisalo, 1924; s: Donner, 1933; kh: Karjalainen, 1927; and Maret Saar, 1987, field work data).

In order to call forth hallucinations, 3—11 rather ripe fruit bodies with flat pilei have been used while with the object of facilitating work and other physical strain 3—5 young fruit bodies with convex pilei have been chosen (ch, k: Vladimir Lebedev, 1987, personal communication). There is only one piece of information how the dose was determined in a special case of AM consumption. According to a Khanty of the Yugan, AM was administered until the person's spirits began to rise continuously, i.e. when no falls could be detected (Maret Saar, 1987, field work data). It must be stressed that in that region the fungus was eaten unhurriedly, biting small pieces of the pileus, chewing them carefully, and washing down mouthfuls one by one*.

Data on the quantity of fruit bodies and liquid for making extracts and on the consumed quantities are scanty. For beginners the extract was made of 7—9 fruit bodies per 3 l of water. The effect was expected to show itself after emptying the first mug (K, Ch: Yuri Simchenko, 1987, personal communication). To induce a state necessary for epic performances or to evoke a pleasant psychic state, the extract of three fungi has been used (s or kh of the Narym: Georgi, 1780).

In the case of fresh raw fungi only one fruit body at a time has been eaten and its effect has been compared to that of an extract made of three fungi (Georgi, 1780); three fruit bodies have been regarded as fatal (k: Johelson, 1905, 1908). More fruit bodies could be eaten only when cooked or dried (K: Langsdorf, 1809).

Precautionary measures. No aggressive behaviour has been observed in people of animist-shamanist cultures under the influence of AM. A review of the respective literary data has been presented in the book by Wasson (Wasson, 1968, pp. 155—158, see also pp. 176—178). There have been very few mortal cases (K: Langsdorf, 1809; k: Slyunin, 1900; Enderli, 1903; Johelson,

*Another factor determining the dose was the sacred conception that only an even or uneven number of fruit bodies could be administered. The number depended on certain beliefs. For instance, speaking of the perception of the limits, the Khanty of the Yugan added: "If you feel after eating two fungi that it is time to finish, you should still eat one more". When practising AM consumption one must always take an uneven number of fruit bodies (K, Ch: Yuri Simchenko, 1987, personal communication).

1905, 1908; and Yelena Batyanova, 1987, personal communication; fn: Lehtisalo, 1924). Such a situation was guaranteed by observing several rules.

People apt to aggressive behaviour under the influence of AM were eliminated with the help of the procedure performed with each prospective fly-agaric consumer. The beginners were given a little AM extract, and their behaviour in the state of intoxication was watched. In case of quarrelsome behaviour, the use of AM was prohibited in the future (K, Ch: Vladimir Lebedev, Yuri Simchenko, 1987, both in personal communications)*.

Undesirable course of intoxication was avoided by following three rules.

(1) Weak people consumed AM in the form of an extract, i.e. in the manner where its psychotropic effect was the least (ch, k: Vladimir Lebedev, 1987, personal communication).

(2) The person under the influence of the fungus was not disturbed in any way. "Let him do what he wants to. If the others interfere, he may do himself harm or injure himself" (K, Ch: Yuri Simchenko, 1987, personal communication).

(3) AM and alcoholic drinks were not consumed simultaneously (kh: Kulemzin, 1976; Ch, K: Vladimir Lebedev, Yuri Simchenko, 1987, both in personal communications). "It is said that by using the two together one may even die. The fungus and alcohol have effects contrary to each other. For instance, when two people meet, one of them having eaten AM and the other having drunk vodka, the former sees the latter as being a filthy force, black even in colour, detrimental to men, and he passes by him from afar" (ch, k: Vladimir Lebedev, 1987, personal communication). Slyunin (1900) describes a case where a Koryak intoxicated by AM drank vodka as a wonderful antidote and found the new state most unpleasant.

Effect

The most fundamental reviews of the effect of AM on people have been presented by Langsdorf (1809), Johelson (1905, 1908) and Bogoraz (1904—1909). Watching all the cases of its usage together, they have proceeded from the depth of the changes both physical and psychic, and from a person's stage of contact with the surrounding world. On the basis of the aforesaid, the effect of AM has been classified, distinguishing two or three forms. These classifications do not express all the aspects of AM effect with equal clarity, especially where sacred and magic activities are concerned. This can be explained by the circumstances that investigators of European origin can perceive in full neither the essence of the transfigured state of conscious mind nor the ways of achieving such a state, let alone the differences springing from the use or omission of AM during the rites. Therefore we should estimate the effect of AM according to the explanations of AM consumers themselves.

*Aggressive behaviour, however, comes across very rarely (Vladimir Lebedev, 1987, personal communication).

In addition to the explanations and descriptions given above, we shall review lethal cases of intoxication presented by Karjalainen (1927): "If anyone consumes too much of it, his teeth become clamped together, foam comes out of his mouth, his eyes bulge, and he can be saved only by the forcible administration of milk or salt, for *panx* (AM: M.S.) wants nothing to do with these substances".

Summary

The analysis of AM consumption in animist-shamanist cultures revealed that the fungus has been used as a multifunctional psychotropic substance. Being a motive psychostimulant, it has facilitated work and relieved physical stress. Possessing the ability to speed up the reproduction and processing of information, it has formed part of sacred rites and helped in performances of folklore. It has also been used for narcotic purposes.

The fungus has a simultaneous (but not equal) effect on several psychic functions. It can be directed by the optimum choice of the administered amount as well as proper selection of suitable fruit bodies. The consumer's attitude towards the procedure can also be made a tool to achieve the desired aim.

Possible unfavourable side-effects are eliminated by observing several rules.

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