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Fungi, Folkways and Fairy Tales: Mushrooms & Mildews in Stories, Remedies & Rituals, from Oberon to the Internet

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Abstract: Fungi are manifest in a multiplicity of folktales and fairy tales, and in folk remedies and rituals. They appear as foods, poisons, diseases, decorations, dyes or tinder, and even in insults, compliments, graffiti and video games. These and other impacts of fungi on folkways are here concisely reviewed under categories likely to interest professional and amateur mycologists and accessible to the lay reader. The evolution of popular perceptions of fungi is sketched from Shakespearean times through contemporary European and American cultures. Provided are specific instances of how different cultures utilized or avoided fungi, responded to fungal diseases of crops or humans, or viewed fungi in the context of popular belief, superstition or religion.

Key words: ethnomycology, ethnobotany, fairy rings, fairy tales, folktales, folkways, fungi, mushrooms, plant disease, ringworm, tinder fungus, toadstools, witches' broom, witches' butter.

Catalogue Resume: Introduction. From Shakespeare through the Victorian Era:

Fungi in the Shakespearean perspective and the folkways of western Europe; Fungi and folkways in eastern Europe; Fungi and the fairy faith in Celtic countries; Fungi and witches; Persistence of beliefs about witches and fungi into more modern times; Fungi and miraculous tales (including Märchen, Wonder Tales); Protection of agricultural crops against fungal plant diseases; The Victorian re-crafting of the image of fairies and their relation to fungi; Body parts and pixie farts. Folkways in late nineteenth and twentieth century Europe and America: Mushroom collecting as a context for folktales and folk belief; Folkways of mushroom hunting; Love and enchantment; Illumination and contamination. Traditional folkways transplanted to North America: Mycophilic and mycophobic immigrant groups; Fungi in song and story; Fungi in healing and ritual. Fungi in folkways for healing and prevention: Teas, infusions, diet; Poultices; Styptics; Other applications and afflictions; Miscellaneous medicinal uses for lichens. Other uses: Color and tinder; Pot-pourri et cetera. Impact of fungal imagery on Victorian and modern literature: Fiction, nonfiction, poetry; 'Toadstool' as an invective in propaganda and journalism. Neopaganism, urban legends and more: Santa and psychedelics; Modern witches, neopagans and retro-fairies; Magic mushrooms used to explain world religions and higher consciousness; Fungal funnies, graffiti and urban legends. Conclusions and postscript. Acknowledgements. Literature cited.

Introduction: What are fungi? Fungi comprise mushrooms, toadstools, mildews, molds, rusts, smuts, yeasts, and even those woody, shelf-like conks that grow on trees. Most mycologists (people who study fungi) also study fungus-like organisms like slime molds and water molds. They refer to all of them, informally, as fungi. Nearly all these organisms, except for some single-celled yeasts, are at some stage of their life cycle composed of microscopic, threadlike bodies called *hyphae*, and reproduction occurs via a variety of spores or spore-like propagules. What are folkways? Folkways comprise folklore (including fairy tales, myths, legends, tall tales, jests, ballads, urban legends, etc.), and folk practices (including hunting and gathering, cooking, weaving, carving, etc.). Folktales in particular merge by degrees into literature, and provide motifs and clichés for the literary class as well as the common folk. The connection of fungi to folkways has an extensive and ancient history, often fading into the twilight of prehistory. The impact of fungi on putatively ancient (i.e., pre-Christian) folkways of Slavic eastern Europe or

those of the Celts of western Europe is especially well documented and has been concisely summarized (Dugan 2008).

It is very difficult to trace precisely the temporal and spatial origins of folktales and other folkways, but extensive compilations and indices have at least documented the geographic and cultural span of motifs, plots, etc. (e.g., Aarne 1961; Baughman 1966; Propp 1968, 1984; Thompson 1955-1958; Uther 2004). Written compilations of folktales and other documentation of folkways are exceedingly scarce prior to the Renaissance, and usually commence much later, but about a tenth of European folklore can be traced to collections from the Middle Ages (Kready 1916).¹ Thompson (1977) gave multiple examples wherein tales collected much later from the oral tradition had been located in earlier written compilations from

¹ Ziolkowski (2006) explores in great depth the influence of medieval Latin traditions on certain fairy tales. Anderson (2000) probes for narratives with fairy tale qualities in classical antiquity. Both, but especially Ziolkowski, contain summaries of the debates over the relative antiquity of folktales and fairy tales.

the Renaissance or Middle Ages. But he noted that it is practically impossible to exclude the possibility that even very early literary collections had oral precursors, and some tales seem to exhibit such an extremely broad geographic range, and possess such extensive variants, that it is most probable they attained these attributes prior to being recorded in writing anywhere.

Explicit documentation of fungi in either oral or literary traditions is sporadic, but fungi are occasionally recognized explicitly by assignment of a given motif, e.g. in Thompson (1955-1958), the taboo of digging in a fairy ring is motif number C523.2, the kinds of magic bestowed by mold from churchyards are recorded under D1278.1, and motif number F343.19.1 is for fairy bread that will turn to toadstools if not consumed the day that fairies make a gift of it. A limited number of other examples are present in the types of Aarne (1961) and Uther (2004), and other compilations.² Philological and linguistic aspects of folkways pertinent to mushrooms have been addressed in detail (Toporov 1985). Occasionally, the etymologies of given popular (folk) mushroom names are traced in detail from one language to another, e.g., from German to Slovene or vice versa (Reindl 2005). In general, however, references to fungi in miscellaneous folkways must be documented piecemeal as they are encountered. Provided herein are numerous manifestations of fungi in the folk tradition, organized rather informally under categories most likely to interest the professional or amateur mycologist, but also the general reader. This review focuses on folkways in the European traditions, and on North American traditions derived from the European, from just prior to

the seventeenth century to the present, but will occasionally mention aspects from earlier periods. Although all times subsequent to the Victorian era are herein termed modern, this review concludes with a section on folkways that are more specifically contemporary, i.e., roughly coincident with the era of television, the atom bomb and rock 'n' roll. Professional folklorists carefully distinguish the genres of myth, legend, epic, folktale, joke, riddle, etc.; and professional mycologists discriminate between ascomycetes, basidiomycetes, zygomycetes and other fungal or pseudo-fungal taxa. In the interests of appeal to the lay reader, such taxonomies will be de-emphasized here. Slime molds, actually related to protozoa, will be considered fungi, and the eccentricities of New Age neopaganism ("fake-lore" to some) will be sampled alongside remnants of centuries-old peasant belief. The fungi called yeasts are integral to brewing and baking, and, of course, leavened bread and fermented beverages appear often in folktales. Only a few references will be made here to yeasts and their products, but the subject of bread and beverages has been reviewed extensively for ancient and classical antiquity (Dugan 2008). A very readable and humorous introduction to the overall historical impact of fungi has been provided by Money (2007a).

From Shakespeare through the Victorian Era

Fungi in the Shakespearean perspective and the folkways of western Europe

Although some literary European folktales, such as those of Reynard the Fox, first appear in written form in medieval times or even before (e.g., Aesop's Fables), most of our well known fairy tales and folktales were first documented only from later periods. Prime examples are those of the Arabian Nights (The Thousand and One Nights) in the sixteenth century, Charles Perrault in the seventeenth century, Madame d'Aulnoy in the seventeenth and early eighteenth centuries, and the brothers Grimm and Alexander Afanesiev in the nineteenth century (Ashliman 2004; Kready

² The distinctions between functions, motifs, plots, and types, etc., are glossed over here, as are the finer distinctions between genres of folklore. They are all components or attributes used in classifying folklore, including folktales. Inspection of Dundes (1962) will suffice to advance any mycologist or lay reader to a higher level of confusion on the matter.

1916). Sometimes fungi play an incidental role in these stories, essentially helping to establish context, and at other times fungi are integral to story content. References to fermented beverages such as wine, beer or mead can be prominent, such as the glasses of wine in the Brothers Grimm (1944), 'The Robber Bridegroom'. Also notable is the persistence of fairy rings or mushrooms in folktales from Celtic countries and other parts of Europe, about which more below. Avery (2002) reproduced the frontis-piece from d'Aulnoy's *The History of the Tales of the Fairies*, showing "a race of fairies" dancing in a ring. Madame d'Aulnoy was "very popular with the literary English and probably the first fairy-tale writer that many English young ladies encountered" (Avery 2002).

Prior to the Shakespearean era, mushrooms also occur in the context of folk recipes, either simply for food, or as potions: Cockayne's *Leechdoms, Wortcunning and Starcraft of Early England*, as cited by Ramsbottom (1953), has a recipe including mushrooms for making a woman pregnant. And several coats-of-arms are cited by Ramsbottom (1953) as portraying mushrooms. Of course, mushrooms were often associated with decay, as in those portrayed adjacent to an old stump in Matthiolus (Mattioli 1563, Fig. 1). Sometimes mushrooms were additionally associated with "lower" animals, a relic from medieval and classical times (Dugan 2008; see also Molitoris 2002 and Rolfe and Rolfe 1925, both illustrating a variation of Fig. 1 with a snail and a serpent).

The explicit linkage between mushrooms, toadstools and fairies in literary traditions essentially starts in Shakespearean times. Use of the word 'fairy' was well prior, at about 1300, but use of the term 'fairy-ring' was from 1599 (Serjeantson 1936). Although references to fungi are not always positive in the English literary tradition, eventually references to

mushrooms in the context of fairies assumed a benign context.



Fig. 1. Mushrooms, from Mattioli (1563).

Most common is the pileus (cap) of a mushroom as a table for the fairies:

"A little mushroome table spread,
After short prayers, they set on bread."
(Robert Herrick, *Oberon's feast in Hesperides*, 1648, cited in Green 1962 and Schwenger 1979).

"Then o'er a mushroom's head
Our table-cloth is spread ..."
(anonymous, *Queen Mab's Invitation*, ca. 1658, cited in Green 1962).

"Upon a mushroom's head,
Our table we do spread..."
(from d'Aulnoy, eighteenth century chapbook, cited in Avery 2002)

And of fairy rings, those circles formed in the grass from the growth of mushrooms (or, depending on their reproductive cycle, the circle of mushrooms themselves) much was written:

"And nightly, meadow-fairies, look you sing,
Like to the Garter's compass, in a ring
Th' expressure that it bears, green let it be,
More fertile fresh than all the field to see."
(From *The Merry Wives of Windsor* cited in Rolfe and Rolfe 1925)

"A pleasant mead,
Where fairies often did their measures tread,

Which in the meadows made such circles green,
As if with garlands it had crowned been."
(From Browne, *Britannia's Pastorals*, ca. 1613-1616, cited in Rolfe and Rolfe 1925.)

"... Fairies dancing upon our green, and they were little, little creatures clothed in green ... and danced in moonshiny night around, or in a ring ... where mushrooms grow."
(Keightley 1873, citing Brand's edition of Bourne, *Antiquitates Vulgares*, 1725).

"Of airy elves, by moonlight shadows seen,
The silver token and the circled green."
(Pope, 'The Rape of the Lock', cited in Rolfe and Rolfe 1925).

Sometimes the subject is popular superstition about such rings, e.g.:

"He who tills the fairy green,
Nae luck again sall hae."
(19 July 1819, *Edinburgh Magazine*, cited in Rolfe and Rolfe 1925; Findlay 1982 gave a more complete version).

Shakespeare believed that sheep would not graze grass on fairy rings [see quote from *Tempest* cited in Latham (1878) later in this article], as did other European writers (Findlay 1982; Rolfe and Rolfe 1925). [Welsh sheep, however, "eat it greedily - hence the superiority of Welsh mutton" (Sikes 1880)]. Most such literary manifestations no doubt originated from a folk background. Keightley (1873) cited an informant in Devon: "Pixies are the souls of infants who died before they were baptized. They are of small stature ... [their] attire is always green. Dancing is their chief amusement ... always at night; and thus they form the fairy-rings." A popular belief was that by stepping inside a fairy ring, one would put oneself within the fairies' power, often with unfortunate results. An example is found in Findlay (1982) and Ramsbottom (1953) of an incident in 1663, in which a curate was witness to "elves or fayries

comming over the downes" and "dancing rounde and rounde, and singing and making all maner of small odd noyses." The good curate was discovered, surrounded, pinched all over, and left at sunrise in the middle of a fairy ring.

There are multiple accounts of fear or respect for fairy rings in Europe and Britain. "In Germany they are called 'Hexen Rings' (Hexe meaning a witch) and are ascribed to the dancing of witches on Walpurgis night, which is on the eve of May Day when the old pagan witches were thought to hold high revelry" (Findlay 1982).³ The first appearance of the tales of the Brothers Grimm appeared in English in 1823 (as *German Popular Stories*) and featured a drawing by George Cruickshank of fairies dancing in a ring (reproduced in Garry and El-Shamy 2005). "In France they are also called 'Ronds de Sorcières' and there enormous toads with bulging eyes are said to appear" (Findlay 1982). Henry More (1614-1687), a scholar at Cambridge, wondered if fairy rings "be the rendezvous of witches, or the dancing places of those little puppet sprites which they call elves or fairies" (Morgan 1995). Fairy rings were attributed to dancing elves, who "make so deep an impression on the earth that no grass grows there, being burned with extreme heat," (Olaus Magnus, *History of the Goths*, 1628, cited in Ramsbottom 1953). There were other folk beliefs involving heat: "In the Tyrol, however, they have a quite different notion about Fairy Rings believing that a winged dragon was wont to fly over the fields scorching the grass with his tail - but why, one wonders, did he fly in such small circles?" (Findlay 1982). Harrison (1973) reproduced an illustration attributed to Olaus Magnus, showing bird- and cloven-footed creatures, with and without tails and horns, dancing in a stylized ring; one plays a bagpipe. Molitoris (2002) reproduced several analogous prints from old chap-books, etc., illustrative of the

³ The actual German word is Hexenringe. "It means, literally, the circles that witches form while dancing" (B. Hyner, personal communication).

connection between fairy rings, witches, devils, etc. The frontis piece of Henry More's *Philosophical Poems* (1647) clearly showed devils, sprites, a toad, a dragon, figures with wands, etc. associated with dancers in a fairy ring (reproduced in Briggs 1976).

Belief in the connection between fairy rings and fairies was persistent. Sir Arthur Conan Doyle ("the great protagonist for the existence of fairies") was quoted as noting, "Certainly from all time these circles have been associated with the gambols of the little people" (Rolfe and Rolfe 1925). Analogous beliefs in West Sussex were documented in 1868: "Those singular circles in the grass known by the name of fairy-rings, 'the green sour ringlets whereof the ewe not bites' (Tempest, v.1) are still believed to be caused by the feet of fairies who have danced there... We still regard the beautiful red cup-moss as the fairies' baths," (Latham 1878). More examples, in a specifically Celtic context, are provided below in *Fungi and the fairy faith in Celtic countries*. Brand (1893) gave a readable account of popular beliefs and scientific accounts of the origin of fairy rings at the end of the nineteenth century, as well as several more examples of celebrations of fairies and fairy rings in verse.

Other aspects regarding fairies and fungi are worthy of mention, specifically the connection between megaliths, fairies and fungi: In the British Isles, and Ireland in particular, it was sometimes believed that the stone circles or other ancient monuments were relics erected overnight and "credited to the industry of the fairies, ... giants or the Devil" (Gill 1944). The same Gaelic expression for "a one night's growth" (*fás na h-aon oidhche*) was applied both to the megalithic structures and to mushrooms (Gill 1944).

In some tales about fungi, the context is specifically Christian and does not involve fairies: A motif apparently distributed throughout Europe features various versions of a

story about St. Peter, Christ and the edible and inedible mushrooms. When traveling, Christ and St. Peter beg for bread, and are given both brown and white bread. Crumbs from the white bread fall to the ground and become edible mushrooms, but crumbs from the brown bread become toadstools. Another version has Peter secretly eating some stolen cakes, which he has to spit out, whereon the cakes become mushrooms (recounted from Bohemian and Czech sources in Morgan 1995). From Hungary it is recorded, "... a piece of bread falling out of St. Peter's mouth, who is eating secretly, is turned into a mushroom by Jesus," (Lammel-Ilona Nagy 1992). In other instances (Sicilian, Hungarian, Lithuanian) mushrooms are produced from St. Peter's spittle (Aarne 1961; Uther 2004), or "mushrooms from the spittle of deity" from the Lithuanian (Thompson 1955-1958).

Another motif recorded in explicitly Christian context is the use of mold from graves or churchyards. From Thompson (1955-1958) we have such mold placed on a corpse to prevent its return, or put on a table for the dead, or used in magic. In the latter instance, the mold can confer ability to understand language of animals, or confer clairvoyance, or produce love. Carried in a hat it prevents witchcraft, and also can be used as a remedy. In one story, a huntsman is released from wandering by mold from Christ's grave (Thompson 1955-58).

Fungi may also have had extensive, but indirect, influence on a certain motif prevalent in world legend and myth: the plant that confers immortality or at least restores life. Brewster (1972) contended that the "fungus of immortality" (common to both Chinese and Persian tales), was an example of this kind of plant, and drew other examples (not necessarily fungal, but by implication related to or derived from the Persian and Chinese stories) from Babylonian, classical Mediterranean, Indian, Germanic, and Finnish mythology.

In spite of these largely benign views of fungi or mold (or at least these uses for them), there are many indications that the Anglo-Saxon and Nordic elements of the population in the British Isles viewed fungi with suspicion, especially with regard to their use as food. Similar attitudes prevailed in Scandinavia: "The folk of Norway and Sweden - countries that abound in mushroom life - think of the chanterelle as the one edible mushroom of the forests, which goes to prove that an abundance of mushrooms does not suffice to bring familiarity with them" (Wasson and Wasson 1957). In fact, there are several oft-quoted instances of specifically British mycophobia (all contained in Wasson and Wasson, but see also Benjamin 1995), of which a couple of the more livid should suffice:

From Percy Shelley (*The Sensitive Plant*, 1820):
 "And agarics and fungi, with mildew and mold,
 Started like mist from the wet ground cold,
 Pale, fleshy, as if the decayed dead
 With a spirit of growth had been animated!"

Arthur Conan Doyle (*Sir Nigel*, 1906): "The fields were spotted with monstrous fungi of a size and color never matched before - scarlet and mauve and liver and black. It was as if the sick earth had burst into foul pustules."

And, although the French are known to appreciate a variety of fungi in the diet, sometimes the attitude toward fungi is ambiguous. A prime example from French literature, Moliere's (1622-1673) *Le Tartuffe*, bestows the name for truffle on an exquisitely cultivated hypocrite and rogue. Moliere's choice of name has been analyzed from several perspectives, including the etymological in addition to the mycological. "Tartuffe conjures up a low and covert creature which must be ferreted out and revealed before it can be destroyed" (Montgomery 1973). (One wonders if Montgomery, an American, had any fondness for truffles to offset his rather mycophobic perspective!) As an aside, it should

be noted that truffles were esteemed by the Greeks and Romans (Dugan 2008). It has been recorded that truffles subsequently disappeared from the table only to reappear in the fourteenth century (Lacroix 1874).

These mycophobic views contrast strongly with the mycophilic folk culture of eastern Europe, as detailed below.

Fungi and folkways in eastern Europe

The attraction of the Slavs, especially the Russians, to fungi is well known: "All Russians know the mushrooms, not by dint of study as the mycologists do, but as part of our ancient heritage, imbibed with our mother's milk" (Wasson and Wasson 1957). This is often contrasted with other countries in western Europe. "In France and Italy the peasants know many of the mushrooms ... The Germanic people are less informed than the French, and there is evidence that what they know is of modern acquisition. But when the traveler reaches the lands of the northern Slavic peoples and the Lithuanians, the folk knowledge concerning mushrooms broadens and deepens [to] astounding proportions" (Wasson and Wasson 1957). Indeed, the folk knowledge of mushrooms in Russia reflected the fact of mycorrhizal symbiosis between certain mushroom hyphae and tree roots. Although the anatomical and physiological details of this symbiosis were unknown at the time, peasant names for many mushrooms incorporated the name of the tree with which the mushroom was most frequently associated (Wasson and Wasson 1957). Note, however, that attraction to mushrooms is not uniform throughout eastern Europe. In Estonia, for example, mushroom picking is popular with Russian immigrants, but less so with native Estonians. "Names for mushrooms in Estonian are almost all loan words from Russian" (from an interview in Auer 1996).

In spite of an attraction to mushrooms collected for the dinner table, spoken references to mushrooms often needed to respect an

"atmosphere of mystery and taboo" under which an unseemly interest in mushrooms was a "display of depravity or shamelessness" (Toporov 1985). This was not because the Russians were mycophobic (as stated, they loved to collect mushrooms and make extensive use of mushrooms in the diet), but because certain types of mushrooms were signifiers for sexual relations: "One would hear again and again such remarks as 'you're still little, when you grow up you'll find out' ... or 'only girls need to know this; boys have no reason to' (Toporov 1985). Toporov (1985) presented detailed, theoretical schemes for the symbolic relation of mushrooms to diet, sexuality, celestial and meteorological phenomena, and to "lower" animals (vermin, worms, frogs, snakes, etc.) not just in Slavic culture, but world-wide. Many of his conclusions transcend the limits of discussion here, especially the role of mushrooms in the hypothetical, ancient Nostratic language. A more recent analysis of the semantics of mushrooms in folk language is available in Russian (Nadel-Czerwinska 2002).

The generally high status of mushrooms in eastern Europe is sometimes directly reflected as a positive symbolic value in song or speech, as in a White Ruthenian (Polish) folk song titled, 'Our bridegroom is like a mushroom': "To say that anyone is like a mushroom is to pay them a great compliment," (Iwanowska and Onslow 1924).

But, associations with fungi in an eastern European context can sometimes be negative or at least ambiguous. Some folkways from this region are connected to the witch Baba Yaga (see below on *Fungi and witches*). The connection between fungi on the one hand and female supernatural entities (deities, spirits, witches, etc.) is regarded by some as ancient (see review in Dugan 2008). A malicious (or at least capricious) spirit called a *leshii* roamed the forest, and "wrinkles on mushrooms were marks of the *leshii*'s whip" (Ivanits 1989). These *leshii*, although sometimes human in appearance, were

more properly spirits than witches. According to one source, they could shrink "small enough to hide behind a mushroom" (Warner 2000). The *leshii* was also noted for its shape-shifting ability, including the ability to change into any animal or plant, including a mushroom (Mack and Mack 1999).

Fungi and the fairy faith in Celtic countries

The Celts have been recognized as having a special relationship with fungi, manifest in the association between fairies and fairy rings, especially among the Irish. Many tales reflecting this association have attained a wider distribution within the British Isles and in western Europe as described above. These tales have been summarized in Dugan (2008) and Morgan (1995), and most link fairy rings, puffballs and the like with presumably ancient pagan beliefs and practices. This is often on the presumption that beliefs in fairies are reflective of the relegation of pre-Christian deities to the fairy realm [see Evans-Wentz (1911) on the "fairy faith"]. Sometimes evidence is slightly more direct, and the temporal assignment is not as remote, as in reference to medieval Irish poets possessing secret knowledge of fungi (puffballs in this instance) and plants (Patton 1992).

Rutter (2000) gave a tidy synopsis of the impact of fairy rings on folklore, mostly of the British Isles. Their fungal origin has been documented from the standpoint of science since the latter part of the eighteenth century, the most famous instance being that of William Withering. Withering's rings were caused by *Marasmius oreades*, whose common name today is the fairy ring mushroom, but there are many other species which also grow in rings. Nonetheless, beliefs in the connection of fairy rings with actual fairies long persisted, as per examples above under *Fungi in the Shakespearean perspective and the folkways of western Europe*. According to some, there was a resurgent interest and belief in supernatural explanations for the rings: "In the sixteenth century ... the belief in fairies was falling

on evil days, and until its recent curious revival, it had generally almost disappeared ... although occasionally still surviving here and there, while certain curious beliefs relating to the rings were current in quite recent times" (Rolfe and Rolfe 1925).

Fairy rings in Breconshire, Wales, furnish a typical example of the Celtic lore. "When Anne Thomas was a girl, the children and she were all warned never to go inside a fairy ring. 'When we was going to school, in the Celyn's meadow, there was fairy-rings, and grandfather did say we must mind and not put our foot inside the fairy-rings, else the fairies would have us' " (Hartland 1913). As it transpired, this narrator knew of a man, who when coming home intoxicated from a fair, had heard music in the rings, had trespassed, and danced there in the ring. When he finally came out and went home, years had elapsed, and all he knew were not to be found. Even worse could happen. Once inside the fairy ring, a person might be forced to dance indefinitely. One poor chap, finally pulled from the ring a year after his disappearance (Fig. 2), expired immediately on tasting food (from Wales, in Sikes 1880). In the west counties of England (Somerset, Devon and Cornwall, those with the most Celtic influence), pixies would "steal horses and night and ride them around in circles, called 'gallitraps', a term for fairy rings" (Briggs 1976). [Note that pixies are sometimes to be distinguished from fairies. Briggs (1976) is an adequate guide to the taxonomy of supernatural creatures in the British Isles, and the information in her encyclopedia, including that on fairy rings, is documented in the context of motif number(s) in the Thompson folk-motif index.]

Other evidence of interest is the association of individual fairies with fungi. Puck as an Irish supernatural entity was associated with mushrooms (Breatnach 1993), and according to Grimm (1966, reprint of translation of 1883-



Fig. 2. Pulled from a fairy ring after a year of dancing, from Sikes (1880).

1888), "The Elf-king sits under a great toadstool" (ascribed to a collection of Irish "märchen"). Other connections to fungi include the folk belief in Wales that "fairy bread" must be eaten the same day as it is given, or it turns to toadstools (Thompson 1955-58, citing Baughman). In Welsh lore, mushrooms were "Fairy Food" (Owen 2003, reprint of 1896).

Slime molds were sometimes perceived as remnants of falling stars (Belcher and Swale 1984; Spooner and Roberts 2005). This latter belief may be more widely distributed, as such fungi were perceived as fallen from the sky in Estonia (Jürgenson n.d.). Nieves-Rivera and White (2006) gave examples from world myth on the association between celestial phenomena and fungi, and Beech (1989) provided short summaries and excerpts from medieval, Renaissance and Shakespearean literature illustrating the same concept, especially with reference to meteors and jelly fungi. They specifically mention "starshot" (of Lincolnshire folklore) as being a species of *Tremella*.

Fungi and witches

Perhaps the most persistent link between fungi and witches in folktales is found in the Russian tales about Baba Yaga. This "witch" possessed a dual character, sometimes acting the cruel ogress, other times assisting a hero or heroine. One well known version involves Baba Yaga out hunting for mushrooms, when she encounters a hedgehog

who is also indulging a taste for fungi. Although her immediate inclination is to eat him, Baba Yaga and the hedgehog reach an understanding and he later transforms into a boy with magic powers (Vilenskaya n.d.). Baba Yaga is also an associate of magic and benevolent spirits who dwell under mushrooms (Vilenskaya n.d.). Her association with mushrooms permeates story and art (Fig. 3).

Sometimes fungi were the vehicle, or at least the remaining evidence, by which witches caused trouble for gardens and crops. Witches were held responsible for growth of 'obscene fungi' in people's gardens [Spooner and Roberts 2005, citing Ramsbottom (1953) who discussed a French court case from the surprisingly modern date of 1926 - see *Persistence of beliefs about witches and fungi into more modern times*]. Witches could cause unspecified blights of crops in eastern England (Newman 1945). A decree of Innocent VIII noted that witches, in addition to having intercourse with devils, succubi and the like, "blast the corn of the ground, the grapes of the vineyard, the fruits of the trees" and in general cause "to perish, ...vines ... orchard trees, pasture, grass, corn and other fruits of the earth" (Murray 1917). Surely plant diseases caused by fungi must have been at least occasional causes of these blights and blasts.

Fungi were also amongst the ingredients used by witches for potions. "Until recently, Portuguese witches still used the hallucinogenic fungus *Panaeolus papilionaceus* in their concoctions" (Morgan 1995). *Amanita muscaria* is known as *Hexenpils* ("witches' mushroom") in Austria; and puffballs were reportedly used in potions by witches in the Basque country, according to documents from the Inquisition (Morgan 1995). Toads or frogs (frequent companions of fungi in much folklore) were also often mentioned as ingredients in such potions (Morgan 1995).

Witches' butter and witches' brooms also figure in folklore. Of the former, it was said, "Stabbing,

burning or otherwise destroying these fungi were believed to harm the witch herself or to cause her

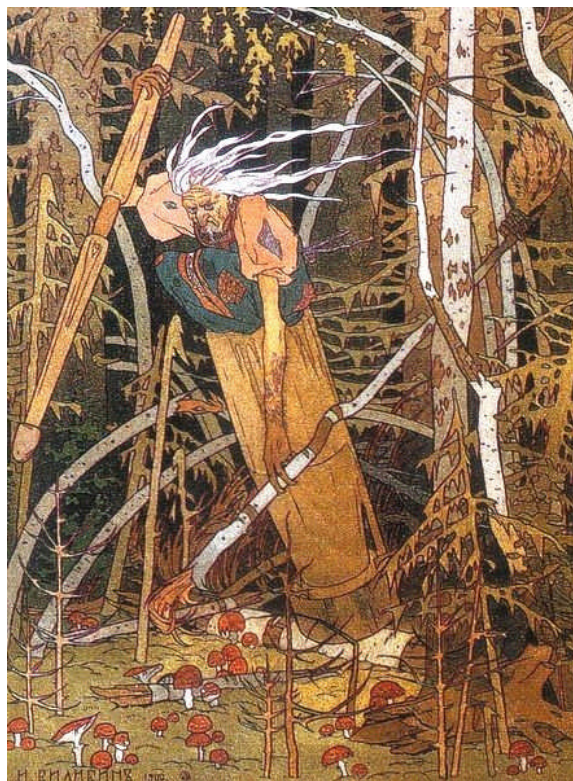


Fig. 3. The Slavic witch, Baba Yaga, with mushrooms, from Bilibin (1900).

to appear" (Spooner and Roberts 2005, citing, in part, Gruffydd 1895), or at least "undo her work" (Owen 2003, reprint of 1896). The belief that "fairy butter" (probably *Tremella* or *Exidia* spp.) was connected to fairies persisted in the British Isles, and the same or similar species were Trolls' butter in Sweden, where "witches (and trolls) milk the cows and scatter the butter" (Rolfe and Rolfe 1925; Thistleton-Dyer 1898). Also from Sweden and recounted by Rolfe and Rolfe: beasts "about the shape of a young cat" bring to witches substance from the devil, and are so full that "they are forced to spew" the substance, which can be found "not far from the houses of these witches.... It is of a yellow colour like gold, and is called 'Butter of Witches.' " Some species "of quick-growing gelatinous fungi" were regarded as excrement or vomit from a milkhare (bjära, trollcat, hare or other supernatural animal created

by a witch and sent out to steal milk) (Nildin-Wall and Wall 1993); if these fungi were burnt or whipped, the witch could be forced to appear. This concept also appeared in Keightley's (1873) description of Finnish belief: "There is a species of mushroom, which if it be fried with tar, salt and sulphur, and beaten with a rod, the woman who owns the Kobald [the Finnish equivalent of *bjära*] will quickly appear, and entreat to spare him." Parkin (2006) provided a detailed account of an episode in 1656 involving such butter, and the sufferings of the Welsh witch, Gwennlian David, when her butter was pierced with a knife. Gwennlian was lucky, and the knife was removed after a fortnight "because of the participants' guilt over the consequences of their actions on such an old woman." Although not connected with witches, the notion of butter (possibly fairy butter) as a product of fungal decay is probably latent in 'Butter is got from the roots of old trees', an illustration by Arthur Rackham for Barrie's (1975, reprint of 1906) *Peter Pan in Kensington Gardens*; the butter is being sliced by a fairy using a toadstool as a table.

Not all yellow fungi reflected in folk belief were jelly fungi. The large yellow slime mold, *Fulgio septica*, was called "shit of witch" in Estonia (Jürgenson n.d.), and was also called "shit of treasure bearer" because it was left where some treasure collector has stolen a treasure.

Other beliefs resulted from fungi unseen except for their effects on plants. Witches' brooms (Fig. 4), anomalous growths caused by *Exoascus* spp., were believed to result from the flight of witches over the affected trees (Rolfe and Rolfe 1925). Poisonings of livestock by forage containing alkaloids (sometimes derived from fungi, as in perennial ryegrass with endophyte, or ergot-infected grasses or grain) contributed substantially to accusations of witchcraft in Tudor and Stuart Britain (Hickey 1990). The psychotropic effects of the ergot fungus may have also impacted folk belief and religion. In

her chapter, "Great Awakening or Great Sickening?" Matossian (1989) conveyed the hypothesis that ergot poisoning was responsible not only for the Salem witchcraft affair, but for the emergence of special religious sensibilities in pre- and post-Revolutionary America. See also 'Roggenwolf' and ergot below.

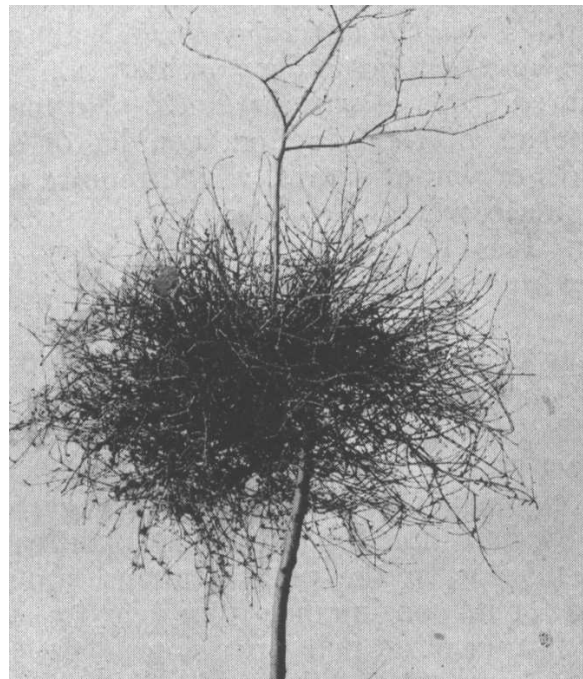


Fig. 4. A witch's broom resulting from infection by *Exoascus* sp., from Masee (1911).

Persistence of beliefs about witches and fungi into more modern times

In the Balkans, dried mushrooms were relatively recently used as an amulet by the window or hearth as protection against witches (Vucanović 1989b). Worobec (1995) chronicled beliefs in late nineteenth to early twentieth century Russian and Ukrainian villages concerning Baba Yaga-like witches ("yellow as a mushroom" and with mortar and pestle, brooms, etc.). Worobec's descriptions of the fates of suspected witches at the hands of villagers make it plain that attitudes common in western Europe during and prior to Shakespeare's day long persisted in eastern Europe, much to the detriment of unfortunate women fitting the classical profile of the witch. A common motif in

Russian folklore is the blighting of crops by witches (Ivanits 1989).

The morphology of some fungi has virtually guaranteed their notoriety. "In a sorcery case in France in 1926, two men and ten women, adherents of the sect Notre-Dame de Pleurs, were charged with falling upon and grievously wounding an Abbé with the hope of eradicating diabolic possession which had enabled him to cast spells on certain members of the sect. They accused him of sending birds to fly from Bombon to Bordeaux over the gardens of the founder of the sect, where their droppings gave rise to fungi of obscene shapes [see 'stinkhorns' below] which emitted such appalling odors that those who breathed them were smitten with horrible diseases" (Ramsbottom 1953).

The lingering associations between witches and fungi (especially harmful fungi) are also reflected in art. The famous architect Antoni Gaudí used a "poisonous ceramic mushroom representing witchcraft and sorcery" in his fantastic creation the Parc Güell in Barcelona (Pizà 2002). It was maintained that this motif was reproduced in the original set design for Engelbert Humperdinck's opera, *Hänsel und Gretel* (Pizà 2002), in which a cannibalistic witch figures prominently.

Fungi and miraculous tales (including Märchen, Wonder Tales)

Fungi have found their way into fairy tales (i.e., those folktales seldom actually involving fairies, but describing magical or miraculous events) in a number of guises. As the most familiar of fungi, mushrooms, they appear especially in eastern European tales. But also present are molds (usually on foods), ringworm, and tinder fungus. The many instances of fairy rings in Celtic folktales have been documented above.

There is a Russian folktale translated as "The War of the Mushrooms" in which a mushroom summons the other mushrooms to war, but all

refuse except the "brown mushrooms" (Aarne 1961, p. 86, citing Afanasiev). Those who wish to see fungi recognized as distinct from plants can note that folklorists have classified this tale amongst animal tales (Haney 1999, Propp 1984). Haney (1999) does not translate the cooperative fungi as "brown" but denotes them as "milky caps" (presumably members of the genus *Lactarius*). Amongst the draft dodgers are the boletes, the coral mushrooms, the honey mushrooms and others; the instigator is the pine mushroom who, however, resides beneath an oak (Haney 1999). Wasson and Wasson (1957) also give an amusing recapitulation of this tale.

The connection between fungi and witches as noted above is sometimes preserved in fairy tales. In an Italian story, an old witch disguises herself as a mushroom to catch persons who are stealing cabbages from her garden. The thieves are apprehended when one of them tries to pick the mushroom (Calvino 1980). In another Italian tale, a young man carries a large mushroom to his master. He is instructed to return the next day and bring back what he found where the mushroom was growing. This turns out to be two vipers, which through a comedy of errors are finally cooked and ingested by the young man. The eating of these snakes suddenly confers the ability to understand the speech of animals (Calvino 1980).

There is also a particular type of folk tale in which a protagonist must force the princess to say, "That is a lie!" before he can marry her. Naturally, the process involves telling numerous tall tales (what we would call "whoppers"): the hero describes impossible feats like cutting ice with bare hands, or drinking water from one's own skull, or tales of impossibly large animals, persons, or plants, or in a Czech version, a stupendous mushroom (from the Czech collector V. Tille, in Bolte and Polívka 1915). Ziolkowski (2006) refers to this tale, but in a context devolving on giant turnips rather than any mycological issues.

Although the fairy tales of Hans Christian Andersen (1805-1875) are sometimes categorized as literature rather than folklore *per se*, it is certainly true that these tales often fit the category of miraculous tales. One such, *The Hill of the Elves*, recounted details of a grand feast and dance held by the elves: "Out in the kitchen frogs were being roasted on spits, and snakes stuffed with children's fingers were baking. The salads were made of toadstool seeds, garnished with moist snouts of mice; and for dressing there was hemlock juice" (Andersen 1983). Perhaps the "seeds" were just Andersen's way of referring to spores, but just perhaps they were also a playful borrowing from Karelian folklore, where mushroom seeds are listed amongst non-existent things (Krikmann n.d.). Surely a literary invention is Andersen's toadstool in *Watchman of the Tower*, in which the gigantic, spark-spewing toadstool was composed of writings, paintings, thoughts and ideas (Andersen 1983).

Moldy food characterized deprivation, poverty, etc. in fairy tales. In the Scandinavian tale, 'Lars, my lad' the protagonist, lost and hungry in the woods, finds an old hut, goes inside and looks into a big chest, "If only there were some bits of moldy bread in it! How nice they would taste!" In fact, there is no moldy bread, but a succession of smaller chests, the last of which is capable of granting wishes (Wiggin and Smith n.d.). And another: "... in a Breton version of the three-wish legend ...: a little boy is oppressed by his stepmother, who gives him only crusts of moldy bread to eat. [The boy meets a beggar with whom he shares his bread, and is granted three wishes.] The boy's first wish is that every time he looks upon his stepmother she will lose all control of her bowels" (Weber 1981). Pinocchio, beloved (and less vengeful) puppet-boy of Collodi (2002, from Collodi 1883), becomes so hungry at one point that he searches for "a bit of dry bread, a crust, a bone ... a little mouldy pudding ..."

Ringworm, caused by several species of microscopic fungi known as dermatophytes, is unsurprisingly a motif in myth and legend. This phenomenon includes references to "leprosy" which was frequently actually caused by ringworm in ancient times (Dugan 2008). Ringworm of the scalp was sometimes called scald head. In fairy tales, there is sometimes a character known as the 'scald head' - a sort of unlikely hero also represented as an ash lad, a numbskull, lazybones, etc. (Lüthi 1984). In the tale from the *Arabian Nights*, *The Fellaheen and His Wicked Wife*, a scald head saves his master from being murdered by his wife and her lover (Burton 1888). Sometimes, a hero may pose as a scald head by covering his golden hair with a cap (Calvino 1980; Thompson 1977). Sometimes the scald head may be known as Little Baldy or Mangy One (Calvino 1980; Muhawi and Kanaana 1989). The mangy one is not necessarily a hero; in *The Ship with Three Decks* (Calvino 1980), a mangy one (with "a scalp completely covered with mange") is an imposter who tries to prevent the actual hero from marrying the princess. And in a version of *Three Heads in the Well*, the ill-natured daughter is punished for pride and selfishness by a "mangy face" or leprosy (Opie and Opie 1974). Animals too, of course, are also sometimes mangy (but not necessarily incipient heroes), as in a fairy tale derived from Giambattista Basile (1575-1632), wherein *Puss-in-Boots* asks whether his master thinks Puss as worthless as a half-ruined mill or a mangy donkey.⁴

Tinder fungi are also found in folk tales. In an American version of *Cinderella*, ('Ashpet', from a collection in North Carolina and Virginia, Chase 1948), the heroine befriends "an old witch-woman" and combs her hair in return for the borrowing of some fire. The fire is conveyed back

⁴ In their well-known *The Classic Fairy Tales*, Opie and Opie (1974) do not mention mangy animals in their version of *Puss in Boots* from Perrault. However, Foreman's (2005) *Classic Fairy Tales* has the donkey as mangy. In other versions (purporting to be "true" rather than "classic") it is Puss who is mangy (Shipton n.d.).

home by Ashpet in "an old dried toadstool" of "the kind that grows kind of like a shelf on the side of a dead tree ... cut it on edge and put a hot coal there ... You could hold fire nearly a week that way" (Chase 1948). The old witch-woman is, of course, the equivalent of the fairy godmother in Cinderella. See the remarks on tinder and amadou under 'Other Uses' below.

In some instances, fungi have been used (misused?) for purposes of invective. Even in the Roman era, it was an insult to be called a toadstool: "...I'll catch you in the street, you rat, *you toadstool*" (in *The Satyricon* of Petronius). And when Snow White and Rose Red trim the beard of the dwarf, he vents his fury by screaming, "Is that civil, *you toadstool*, to disfigure a man's face?" (Snow White and Rose Red, in Brothers Grimm 1944). Even today, the popular mind commonly regards the toadstool with suspicion and revulsion (see '*Toadstool*' as an invective in *propaganda and journalism*).

Miscellaneous appearances of fungi in marvelous tales also include: "The Mushroom Reviles the Young Oak for Clinging to It" - after three days the mushroom collapses and the oak keeps growing (Aarne 1961, from Latvia). And, in the lore of "barnacle geese" from herbals (at least as old as twelfth century AD), a "fungus growing on rotten timber floating at sea" generates these geese (Rodhe 1922). In Finnish folk belief, lizards were among the lower creatures produced by various contemptuous or ridiculous substances, in this case birchwood and aspen fungus (Abercromby 1890b, 1892). In an Estonian fairy tale, The Wild Man, the hero (destined to become a dragon slayer), sets free a little man held captive within a mushroom (Järv n.d.). In the literary fairy tales of M. de Plantade of Montellier (ca. 1700), we encounter a tiny prince who "brandishes a morel mushroom as a shield and an asparagus as a lance" (Tucker 2003). One Russian fairy tale concerns the youngest of three brothers, a mushroom-loving fool who is transformed into a handsome man

through the agency of the magic horse, Sivka Burka. Prior to his transformation, he is taunted by his brothers, "Ivan, you are a fool, and you talk like a fool. Sit on the stove and eat your mushrooms" (www.artrusse.ca/FairyTales).

Protection of agricultural crops against fungal plant diseases

From ancient times through medieval times and the Renaissance, and in remote places up until the end of the Victorian era, it was common for peasantry to practice certain rituals and/or invoke specific deities, spirits or saints for the protection of crops and livestock. These practices, held in conjunction with bonfires, festivals and feasts, provided many of the social entertainments of European rural life. Although many such practices originated in antiquity or in medieval times at the latest, those pertinent to Europe far north of the Mediterranean were generally documented much later, especially in the nineteenth century by collectors of folk and peasant practices. The most famous compilation is certainly that of James Frazer, most notably in the *Golden Bough* (Frazer 1922, an abridgement by the author of his multi-volume work of the same title). Many pertinent practices were also summarized in Orlob (1971, 1973).

Ritual bonfires (celebrated at various seasons, and called Beltane Fires, Easter Fires, Lenten Fires, or Mid-Summer Fires) were part of rituals for preservation of crop health (Frazer 1922). In actuality, health of crops, livestock and humans, crop fertility, and protection from weeds, pests, plant diseases and bad weather were all aspects of a unifying ritual or deity. Nonetheless, there are occasional direct references to plant pathogens. The Lenten fire in Picardy was recorded as directed against smut, darnel (a weed) and mice. Charred wood from an Easter fire near Forchheim was buried on Walpurgis Day (May 1) to protect wheat from mildew and blight (Frazer 1922). Certain corn spirits might sometimes glide through fields and blacken the growing heads of grain, but could be placated by propitiatory

sacrifices (Orlab 1971, summarizing Frazer). Readers might appreciate knowing that these sacrifices and rituals, performed by European peasantry for protection of crops and livestock and described by Frazer, formed the basis for the British cult classic film, *The Wicker Man* (1973). This movie, and its remake (released in 2006 by Warner Bros.) have drawn various reviews (e.g., Fuller 2006).

Were these folk practices invariably rooted in ancient folkways? Most seem to have been, but some may have been derived from classical or medieval written sources. Note the following regarding the *Geoponica*, a compilation of miscellaneous classical sources: "...Christian or pagan, the sources of [the 10th century AD *Geoponica*] are without exception learned. There is no hint that either Cassianus (the 6th century compiler from which most of the *Geoponica* was later excerpted) or his later excerptor ever talked with farm labourers or peasants to find out what their beliefs and customs were. ... This is of considerable importance ... as any folklorist reading this article will see ... a good deal [of the *Geoponica*] can be paralleled from modern rustic ideas. It is one more proof that a vast proportion of what we call folklore is not really originated from the folk, but has filtered down to them from men of greater learning if not greater sense. The country belief which we ... hasten to collect to-day ... is likely enough to be the science of a century or millennium[!] ago" (Rose 1933).

Berger (1985), writing of the transformation of pagan deities to saints, specified the Celtic goddess Brigid transformed to Saint Brigid. Both were strong and benevolent protectors of cereal crops. Berger's actual allusions to plant diseases caused by fungi are confined to classical times, but she gave a synopsis of the transformation of the Roman Robigalia, a festival and collection of ceremonies against cereal rusts, to the Christian Rogations ceremony. (See Dugan 2008, for a summary and sources on the Robigalia.) Saint Gertrude,

who protected crops from diseases and pests in the middle ages, was another example derived from an older, pagan deity (Powell 1929). Collectors of folklore have continued to garner additional examples. In Herfordshire, a charm for the removal of mildew from wheat was implemented at crop emergence: "a branch of blackthorn (*Prunus spinosa*) ... was cut before daybreak and a portion burned in a large fire in the field" with the remainder hung in the house. The unburned portion might have been burned if disease reappeared (Drury 1992). There is a Finnish folk song about rust in corn: "Depart, O Rust, to tufts of grass" (Abercromby 1890a). And from across the Atlantic we have, "If cotton is planted on a light night, the rust will not bother it" (from North Carolina, in Hand 1964).

Worth mentioning in the context of rituals for crop protection are some references to the malignant Roggenwolf (rye wolf) in Germanic folklore. Thiselton-Dyer (1889) cited various sources on this spirit, whom the peasants apparently tried to appease by leaving a sheaf of rye in the fields over the winter. This spirit was represented in various rituals by a person dressed as a wolf (Thistleton-Dyer 1889). Grigsby (2005) maintained that the Roggenwolf was a personification of ergot, now known to be an agent of convulsions, burning, "massive appetite" and "the sense of becoming an animal - all suggestive of lycanthropy." This latter aspect of the Roggenwolf was documented in more detail by Wettstein (n.d.), whose credibility with mycologists is compromised by attribution of the ergot disease to the fungus *Aspergillus fumigatus*. (The correct name of the agent is *Claviceps purpurea*.)

The Victorian re-crafting of the image of fairies and their relation to fungi

In some countries, most especially those of eastern or southern Europe where fungi were esteemed as food, they were long regarded rather benevolently. But, as we have seen above, such was not always the case amongst the British and

their descendents. Parallel to the mycophobic verse and prose cited above from English sources, are lines from the American poet, Emily Dickinson (The Mushroom):

"Had nature any outcast face,
Could she a son condemn,
Had nature an Iscariot,
That mushroom - it is him."

But this attitude gradually changed, or at least accommodated alternative, benign perspectives on fungi. Jay (2004) documented the "quiet but substantial makeover for Britain's fungi" from "largely shunned, associated with dung heaps and poison" to "pretty, small, delicate" and associated with merry little fairies. As Jay noted, this makeover, largely a product of the Victorians, carried over quite well into the magic mushroom infatuations of the 1960s era in Europe and America.

Interest in magic mushrooms has always received a boost from Lewis Carroll. Jay documented his belief that Lewis Carroll visited the Bodleian Library and there read accounts of uses of the fly agaric amongst Siberian shamans. Lewis Carroll (actually a pseudonym for Charles Lutwidge Dodgson) was of course the author of *Alice in Wonderland* (*Alice's Adventures in Wonderland*, Carroll 1865), which features the famous illustration by John Tenniel of the caterpillar atop a mushroom and smoking a hookah. Alice, of course, is able to ingest some of the mushroom, bites from one side of which make her larger, and the other smaller. Carroll may have also been influenced by the popular guide book 'A Plain and Easy Account of British Fungi' published in 1862 by M.C. Cooke, prior to Carroll's initiation of his writing of *Alice in Wonderland* that year (Wasson and Wasson 1957). There is also a relevant passage in Grimm (1966, reprint of translation of 1883-1888) to the effect that "whoever carries a toadstool about him grows small and light as an elf." The Wassons discounted the possibility that Carroll was

influenced directly by Grimm, but he may have encountered the idea, recorded from Irish folklore, elsewhere. It is worth noting that M.C. Cooke's book, *The Seven Sisters of Sleep* (a half dozen higher plants, plus *Amanita muscaria*) appeared in 1860 (Jay 2004).

At any rate, very probably this "substantial makeover" for mushrooms, magic or otherwise, had antecedents. Joshua Reynolds (1723-1792) painted a very appealing, baby-like Puck seated upon a toadstool (Boase 1947). And already in the first half of the nineteenth century, performances of Shakespeare's *A Midsummer Night's Dream*, experiencing something of a revival, contained elaborate scenes in which Puck made his stage entrance seated on a mushroom; and in one performance the mushroom sank as Oberon, king of the fairies, appeared (Griffiths 1979). By mid-century, Puck astride a mushroom was played by an eight-year-old, Ellen Terry (Nicholson 1998). The use of mushrooms as stage props for *A Midsummer Night's Dream* has persisted; Titania, queen of the fairies, had a giant mushroom for a bed in a modern rendition for the Stratford-upon-Avon festival, one of several theatrical devices considered excessive by one reviewer (Warren 1987).

Fungi influenced the presentation of visual arts as well as drama and theater. Morgan (1995 p. 28) summarized and gave examples of how mushrooms were linked with fairies in art of the Victorian period. Examples of illustrators using this theme were Eleanor Vere Boyle, Richard Dadd, Thomas Heatherly, and Arthur Rackham. This tradition persists (see Howard David Johnson, below). Predictably, at least one modern critic ascribes the inclusion of toadstools in Victorian fairy paintings to subliminal phallic or erotic connotations (Schindler n.d.). Silver (1999) analyzed the impact of fairies on the Victorian consciousness, and referenced the association of little fairies and mushrooms (usually resting on mushrooms, but once, more impishly, using a mushroom as a missile against an injured owl).

Silver's analysis showed fairies as potentially sinister, but the fungi themselves are viewed more neutrally. Nicholson (1998) disapproved of some portrayals of Victorian fairies, in this case for the manner of their "thinly-disguised" eroticism, but the fungi upon which the fairies were seated escaped her criticism. Ripley (2004) presented an intensive analysis of the Victorian sexuality latent in J.M. Barrie's (1975, reprint of 1906) *Peter Pan in Kensington Gardens*, profusely illustrated with pictures by Rackham and often featuring mushrooms, but in Ripley's analysis fungi were furniture, not phalli. A comprehensive, illustrated compilation of fungi in art is available on line (Schaechter et al. n.d.).

Not just fungi, but fairy tales themselves were re-invented by the Victorians; e.g., for certain tales, happy endings were manufactured by the folklorist and scholar, Andrew Lang, using the image of fairies and mushrooms (Susina 2003). Figures 5 and 6 (from Doyle 1870 and Gruelle 1919, respectively) are representative of this benign view of fairies, elves and fungi. [Note that Fig. 5 has been reproduced frequently, as



Fig. 5. Benign views of fungi and fairies: an elf and a fairy exchange a kiss over the top of a mushroom, from Doyle (1870).

detailed in Susina 2003, but also most recently used for the cover of Ashliman (2006).] And the

fairies themselves evolved in accordance with "the exquisite and delicate fancies of the poets" (Murray 1917). Long prior to this recasting of fairies into quaint little imps sitting on mushrooms, fairies were viewed by the Church as identical with, or allied to, pagan deities, spirits or witches. Either fairies or witches might make rings upon the grass with their dancing, and the fairies themselves, especially prior to Shakespeare, were not necessarily diminutive, but usually of normal stature (Green 1962; Murray 1917).

There is a hint in some of J.R.R. Tolkien's early notebooks that even Tolkien himself may have experienced a phase in which he regarded elves or fairies as "little people" (although he apparently got over it - readers of his books will know that Tolkien's elves in *Lord of the Rings* and other works were neither little nor cute). One of his lexicons included the word 'telumbe' or 'inwetelumbe' for mushrooms as a fairy canopy (Fimi 2005-2006).



Fig. 6. Benign views of fungi and fairies: a fairy under a mushroom, from Gruelle (1919).

Strong evidence of the Victorian association of mushrooms with "little people" resides in a case study by Noyes (1889). This study of the mental illness of a certain artistically gifted patient is remarkable for the patient's illustrations, some of which would no doubt have a strong "Jungian"

appeal. These illustrations reflect the associations between fungi and fairies prevalent at the time, but viewed chronologically also acquire a more sinister aspect indicating the artist's descent into mental illness.

An especially charming example of fungal imagery from a Victorian perspective is from the brush of Beatrix Potter, the famous author of *Peter Rabbit* and other books for children. Miss Potter was a capable amateur mycologist and botanical illustrator whose professional ambitions were thwarted by the limitations placed on women of her era. A capsule biography was provided for mycologists by Money (2007b). The example, from an unpublished work by Miss Potter, illustrates Victorian notions not with fairies and fungi, but with the association of toads and toadstools (Fig. 7). This association has a long and intimate history, beyond the scope of this review, but documented extensively in Morgan (1995) and Wasson and Wasson (1957). Although Potter was something of a realist as far as the habits of animals were concerned, it is fair to say her toads are certainly quainter than some earlier examples provided by Morgan (1995).

Body parts and pixie farts

Some "common names" for fungi make use of analogies with body parts (alive or otherwise). For example, the common name for *Xylaria polymorpha* is Dead Man's Fingers, and that for *Xylaria longipes* is Dead Moll's Fingers (Holden 2003). The former has an extensive record of use, but the latter sounds more invented than truly common. Names implying folklore or legend have been long in use for some fungi, i.e., Dryad's Saddle for *Polyporus squamosus*, Elf Cup for a variety of discomycetes, and Elfin Saddle for some *Helvella* species. Witches' Saddles was a name for an unspecified large fungus in Gwent (Davies 1938). Caution is necessary in inferring truly wide-spread or "folk" use of a given common name, as many are admittedly of recent manufacture by various

nature or professional societies (Holden 2003; Norvell 2000). [This manufacture is held



Fig. 7. The Toads' Tea Party by Beatrix Potter. Courtesy of the Victoria & Albert Museum. Permission granted by Frederick Warne & Co.

necessary because, "Unfortunately, there is a paucity of vernacular 'folk names', even in Welsh and Gaelic" (Holden 2003).]

Anatomy-based naming logic has long been applied to those nasty little mushrooms, the stinkhorns: "*Phallus impudicus* means 'rude or shameless penis' and one Renaissance herbal called the mushroom 'the pricke mushroom' " (Spooner and Roberts 2005). Other names were 'devil's horn' and 'Satan's member' and it was once sold in Europe for an aphrodisiac (Spooner and Roberts 2005; Thistleton-Dyer 1898). Because the earlier developmental stages are egg-like, these were also known as the eggs of devils or evil spirits ("Deamonum ova" or "cacodaemonumve ova" - Ramsbottom 1953). Spooner and Roberts (2005) noted the Victorian sensibilities regarding these fungi: "Not surprisingly, genteel Victorians were not fond of the stinkhorn. Beatrix Potter, though a keen illustrator of macrofungi, 'could not find courage to draw it', whilst Charles Darwin's eldest daughter Etty ... would scour her gardens ...

for stinkhorns [which] were then burnt 'in deepest secrecy' for fear they would corrupt the morals of the maidservants." The latter episode was narrated by Darwin's niece, Gwen Raverat (1952).

Some mushrooms, especially certain puffballs, were somehow connected to wolf farts in the European tradition. The puffing action with conspicuous release of spores probably explains the connection to flatulence, but one wonders at the wolf part. "Why wolves should be involved seems obscure. Nonetheless, this connection is maintained with the scientific name for the main genus of puffballs, *Lycoperdon*, which is derived from the Greek for 'wolf fart' (λυκος + περδομαι)" (Spooner and Roberts 2005). An analogous derivation explains the genus name *Bovista* (another puffball) from the German for 'ox fart' (Spooner and Roberts 2005). Note, however, that the derivation for the common name for the puffball is ascribed to the fairy Puck, "a corruption of *puck* or *poukball*, formerly called *puckfist*... The Saxon word for the toadstool was *pulkerfist*" (Rolfe and Rolfe 1925). The word *puckfists* means fairy farts according to Morgan (1995).

Keightley's (1873) Victorian era account insisted that puffballs were named after Puck's fist or foot, and even mentioned wolf's fist and elf's fist, but made no mention of flatulence. Keightley admitted that "wolf and fist are, in fact, incompatible terms" (wolves possessing neither hands nor fists) and suggested that elf's fist was the correct, original meaning, which should not be applied to "thick ugly toadstools" but only to "those delicate fungi called in Ireland fairy-mushrooms." (One suspects that Victorian sensibilities here triumphed over accurate etymology.) Later, Keightley stated, "The pretty tiny conical mushrooms which grow so abundantly in Ireland are called Fairy-mushrooms" thus further binding the connection of fairies to mushrooms with notions of cuteness. This was taken a step further when

recounting the association of fairies with "toadstools or poisonous mushrooms ... named Bwyd Ellyllon, or Elve's food." But Keightley immediately suggests, "Perhaps, however, it is not the large ugly toadstools that are so named, but those pretty small delicate fungi, with their conical heads, which are named Fairy-mushrooms." Again, the Victorian agenda of re-crafting of the image of fairies and their relation to fungi is prominent. And with further connotations of cuteness, there is recorded that small fungi of the sort now termed 'bird's nest' (Nidulariales) were termed fairy purses (Rolfe and Rolfe 1925, citing, with some reservations, reports from Lincolnshire).

Jew's Ear (Judas's Ear), or in modern nomenclature, *Auricularia auricula*, was connected in the imagination with Judas Iscariot, who supposedly hanged himself upon an elder tree after the betrayal of Jesus. In consequence, "this tree frequently bears an appendage strongly resembling a human ear, known as 'Judas's Ear'" (Rolfe and Rolfe 1925).

Folkways in late nineteenth and twentieth century Europe and America

Most of these folkways consist of remnant beliefs from Victorian and pre-Victorian times. Some are interesting merely by virtue of their persistence, and so their antecedents are referenced herein. Some such folkways, no doubt still embedded in the cultures of the early twentieth century, were fast waning or extinct by the close of the century.

Mushroom collecting as a context for folktales and folk belief

Many persisting references to mushrooms are an expression of a cultural affinity for edible mushrooms (i.e., the culture is mycophilic). This is especially true in eastern or southern Europe. In these instances, mushrooms do not comprise the main interest of the story, and the reference to mushrooms is fleeting and introductory, in order to establish a context. This context usually involves a person making a trip to the forest for

the purpose of gathering mushrooms, e.g., a woman goes to the forest looking for mushrooms, becomes lost, lives with a bear and has a son by him (Ivanko the Bear's Son, in Afanesiev 1945). Or becomes lost, and is prey for malign spirits termed *leshii* (from Russia, in Warner 2000). Or simply has a good meal: In Transylvania, a wandering prince decides to stay in the woods, where "he will gather strawberries and mushrooms, and have such a supper that the king himself can't do better" (Gaster 1893). In an instance from Italy, people stayed out of the woods so long in order to avoid a particularly nasty witch, that "the mushrooms that grew there went unpicked and grew as big as umbrellas" (Calvino 1980).

In other instances, being too successful at collecting mushrooms results in charges of witchcraft. From the Ukraine: "A woman who repeatedly returns from the woods with her basket full of mushrooms ... is nothing but a witch who is using her unholy powers to her own profit and ... the detriment of her neighbors" (Koenig 1937). Being unsuccessful was risky, too: "A child picking mushrooms with a neighbor picked more than she did; later he fell ill, and she was suspected of causing it" (from Croatia, in Vukanović 1989a).

Finally, it must be noted that the connection between fairy tales and mushrooms is so implanted in the popular imagination that persons assume it even when it is not actually present. Schubert and Hwang (2000) discuss at length the episodic logic of a version of Little Red Riding Hood wherein she goes astray in the forest by chasing a butterfly and hunting mushrooms. In fact, the version they cite (Perrault 1961) contains no reference to mushrooms at all.

Folkways of mushroom hunting

The extent to which various cultures indulge in hunting wild mushrooms varies tremendously. At one extreme are the Russians, whose

fondness for the pastime borders on mania. Wasson and Wasson (1957) related several episodes from children's and adult literature, e.g., in Tolstoy's *Anna Karenina*, "... a nursery full of tearful little children is turned in an instant from tears to joyous excitement with the announcement that they are to go mushrooming." A Russian nursery rhyme describes a mother who sends her toddler out to collect the *borovik* (a kind of bolete), but when he repeatedly returns with the wrong mushrooms, she finally goes herself and finds it just outside the door. The Wassons further related a story, from V.I. Lenin's wife, that even in a drenching downpour, Lenin himself quickly turned off a mountain path to collect ceps (boletes) and would not cease until his sack was full (an episode which the Wassons think "shows him in a more winning light"). Their point is largely to contrast the mycophilic Russians with the English and Americans, but it is admitted that the Italians, French, plus the Catalans and Basques are also fond of mushrooming and mushrooms.

Even in the United States, there is recognition that mushrooming has become a folk tradition. "Hunting mushrooms each spring is an Indiana folkway" (Dorson 1959). The interests of one Vermont couple led to their contribution of "an exhibit of scrimshaw-like etchings on shelf mushrooms, commonly known as artist's conk, at the Hall of Nations in Paris" (Emery et al. 2003); the same couple derived income from sale of wild mushrooms to restaurants, a situation encountered in other rural lifestyles throughout the United States (Emery et al. 2003). Often, however, foraging for private use is sharply distinguished from commercial picking. Some persons view commercial harvest as a violation of ethical norms, whilst others view it as a legitimate activity calling for its own norms and suitable regulation (Fine 1998). Norms of behavior include the concepts of proper share and respect for environment, but even within circles of devotees debate can be lively (Fine 1998).

To some degree, the debates over commercial picking simply reflect a competition that has always been present. "As often occurs, debate merges self interest with ideological beliefs ... As one mushroomer joked: 'The way I think about it, is to prohibit everybody [from] collecting mushrooms except me' " (Fine 1998).

Competition has always been keen in the presence of direct, economic self-interest. For example, in the past there were in the British countryside persons known as runners, itinerant workers who made a living harvesting stone, picking wild flowers, etc. Mushrooms represented another form of income. Competition for mushrooms amongst the runners meant arising early to have the best pick (Bagshawe 1955).

Story telling in relation to mushroom hunting in the United States has been thoroughly documented by Fine (1998). The stories told by mushroom hunters were categorized: war stories (involving hardship), sad stories (essentially involving failures to collect some especially desired fungus), and treasure tales (mycological finds that "emphasize the remarkable and magical generosity of the natural environment"). Also emphasized are "bragging rights" (stories about a great haul, overlapping with the treasure tale motif), and of course jokes, often employing dark humor, about the dangers of mushroom poisoning. "Humor about poisoning does not account for the majority of jokes told by mushroomers, but the sensitivity of the subject makes it a key topic," (Fine 1998). Some examples included humor about the timing of ingesting possibly poisonous fungi: "Eat them on a Friday, so you have all Saturday to recuperate." And gastro-intestinal upsets: "It turned him inside out. He was worshipping the porcelain goddess all night." And, again from Fine (1988), an especially quotable limerick:

"A chap from the hills of Carolina
Was buried last week in Elvina
After eating some Honeys

He begin to feel funny
(He was attacked by a fall *Galerina*.)"

A catalog of mycological humor, much of it esoteric, was compiled by Michael Tansey and is available on line at www.bsu.edu/classes/ruch/msa/tansey.html.

Given that Slavic folklore has much to say about sexuality and gender of mushrooms (see *Fungi and folkways in eastern Europe*), it is interesting that there are analogs in the contemporary culture of American mushroom hunters. "Any plant (sic) kingdom that includes *Phallus impudicus*, *Amanita vaginata*, *Nolanea mammosa*, and *Clitocybe nuda* demonstrates that human sexuality influences how we perceive nature," (Fine 1998). As it happens, Fine was well acquainted with Toporov's ideas, and used these in a gloss on how gender is assigned to mushrooms in casual and not so casual conversation. In general, "Male mushrooms are bigger, stronger, and darker than female mushrooms" (Fine 1998). Examples of "male" mushrooms included *Boletus edulis* (the king bolete), *Strobilomyces floccopus* (the old man of the woods) and Slippery Jack (*Suillus luteus* - Slippery Jill is the less common *Suillus subluteus*). The deadly *Amanita* species, e.g. *A. virosa*, are female.

Finally, there are those folkways that, from a scientific perspective, constitute superstitions. This is especially noteworthy with regard to beliefs on edibility. Examples include: Mushrooms that are pink underneath are poisonous (Hines 1965, with a caveat from Alexander Smith on the variability of gill color with maturity). Also, "It is said that any mushroom which grows in an orchard where apple trees are blooming is edible. The same man who [related this belief] nearly died because of his belief in this theory" (Randolf 1933). Aarne (1961) documented from Walloon tales, "A peasant is told a ten-sou piece (silver) will darken mushrooms if they are poisonous. Since he has only nine sous, he removes one-tenth of the mushrooms." Moore (2004) related, rather

skeptically, that a potion of raw rabbit stomachs plus raw rabbit brains is held an effective antidote in case of mistakes.

Other interesting superstitions pertain to collecting itself: "In order to insure a good haul of mushrooms, the hunter must always wear at least one garment inside out" (Voiles 1944). "If you see a 'button mushroom' you should pluck it, as 'it will never grow any more once it is looked at' " (Westropp 1911). And Reindl (2005) cites Slovene sources to the effect that "folk custom demanded that mushroom collectors not mention the mushrooms by name lest they not find them." And finally, not specifically directed at mushroom hunters, but perhaps good advice: "Never kick fungi with your foot, or you will have bad luck for seven years" (Ladbury et al. 1909).

Love and enchantment

There are occasional references to fungi for the enhancement of natural attractiveness. Dew from fairy rings was to be avoided, however: "... the old West-country superstition, which holds that if a maiden desires to improve her complexion, it is only necessary to go out early on a May morning and rub the dew from the grass on her face. It is doubtless still practiced. It is, however, not so generally known that, for this purpose, one must avoid the grass growing within the circles, or the fairies may revenge themselves on the rash intruder into their sanctuaries by spoiling her complexion" (Rolfe and Rolfe 1925; see also Thistleton-Dyer 1898). The practice of using morning dew to improve complexions persisted into frontier America (Lathrop 1961).

The seductive powers of a kiss may be augmented by "placing a bit of mushroom ... under the tongue" (Long 1973, citing material gathered from German sources). It must be admitted that the most widely (and probably successfully) used fungal-derived items for aphrodisiac qualities are the fermented beverages. In case the active ingredient,

ethanol, is by itself inadequate, the beverage can be augmented, e.g., by "gold, taken daily in wine" (Long 1973).

An instance from Ozark folkways was especially forthright in its use of anatomical analogies: "A young girl who finds a stinkhorn fungus (*Phallus impudicus*) regards it as a good omen. Old women say that back in the 1870's adolescent girls would strip off their clothes and dance around this plant. If a virgin touched the stinkhorn to her vulva, it was a sure sign that she'd get the man she wanted," (Randolph 1953).

Illumination and contamination

Fungal bioluminescence seems to have had a persistent impact on folk belief, although fungi are only one of several forms of bioluminescence. There is evidence for the influence of fungal bioluminescence on folklore up to and including modern times. Sometimes modern minds have utilized the notion as a plausible explanation for ancient legends.

One source noted that Will o' the wisp ("Missouri spook light") was attributed by "science minded people" to biological luminescence, from "the well-known fungi *Panus stipiticus* (sic)" ... "which is not as well known as they think" (Weinstock and Cray 1964). Some persons, at least as far back as Shakespearean times knew well enough that rotten wood or fruiting bodies of mushrooms could be luminescent, and made use of the phenomenon by constructing crude lanterns from these materials. Analogous lanterns were constructed of luminescent wood by twentieth century soldiers in their trenches (Glawe and Solberg 1989; Ramsbottom 1953). Findlay (1982), with the hindsight bestowed by modern science, suggested that the "fire on the water" in Beowulf may have been "luminescence from fungi on rotten trees growing in a swamp."

Actually, Will-o-the-wisp is more frequently attributed to the spontaneous ignition of swamp gases, perhaps phosphine in the presence of

methane, but the phenomenon may have been confounded in the popular mind with other luminescence originating from fungi (Dubos 1952). In general, Jack-o-lanterns (another common name for luminescent, Will-o-the-wisp phenomena) were perceived as malicious, leading persons into danger or casting spells (Hand 1964). Of Will-of-the-wisp in eastern England: "descriptions are obscure and contradictory. ... In the fens there is a special form of fire fiend known as the 'Lantern Man' ..." who, if inadvertently summoned by whistling, can be escaped if one "lies face downwards on the ground with the mouth buried in mud" (Newman 1945). Another avoidance tactic, from the southeast U. S., was "turn all your pockets inside out and no harm can come to you" (Hand 1964).

In California miner's folklore, luminous essences from rotting timber were referred to as Jack-o-lanterns; and a fungus growth called "timber frost" simulated flickering light when illuminated. Such events were thought to mark places where miners have been killed (Hand 1942). In the Utah mining camps, "... a fungus growth simulating human hair" and located near the spot where a miner was dismembered in an explosion, was interpreted as the still-growing hair of the miner, essentially transplanted to the mine timbers by the force of the explosion (Hand 1941).

Other instances involve fungi as contaminating substances, which must be acted against or, in some instances, used offensively. An example of the latter is from the Balkans, where in preparation for a bullfight, shepherds sharpened the horns, and smeared "foreheads and horns with a foul-smelling fungus called *knjiginja*," (Vucanović 1961). But instances of the former are more common: "The handling of large species of toadstool, sometimes called 'wart-toadstool,' will cause warts to grow on the part of the hand coming in contact with it," (Hand 1961). Some jelly fungi called "pieces of cloud"

were believed to cause rabies in Estonia (Jürgenson n.d.). And among the Pennsylvania Germans, at the end of the nineteenth century, regarding the proper disposal of husks and vines remaining from harvested corn and beans: "Should they be burned, the next crop of corn and beans will be attacked by 'black fungus' (*brâut*)" (Hoffman 1888). Perhaps this practice had origins in Europe. For analogous practices, see the subsection *Fungi in healing and ritual* in the section below.

Traditional Folkways transplanted to North America

Mycophilic and mycophobic immigrant groups

The concept of mycophilic versus mycophobic cultures has been briefly reviewed above. There are indications that the relative affinities of peoples for fungi are evident in the New World as well as the Old. Notable is the idea that societies derived from Anglo-Saxon culture tend to be mycophobic. Thus we read, "the ethnic core of the Ozarks ...[is]... predominantly white, Anglo-Saxon" hence, "Mushrooms were ignored" (Miller 1968). And, with somewhat more humor, the point was made that Jell-O, not dried porcini mushrooms, is indicative of a wholesome staple for the American diet (Newton 1992).

Fungi in song and story

Nonetheless, we see sporadic references to fungi as a backdrop to song or story. Mushroom collecting as a folkway can form the background of songs, such as one sung in Canada but reflecting Old World values (Slavutych 1960):

"My songs, what am I to do with you?
I shall go to the woods and sow you there.
Some day girls will come there to pick mushrooms
And they will find you, my songs."

One of the most famous American songs is Wildwood Flower (Carter Family song, traditional), which has the line "The pale amanita and islip like blue" (www.bluegrass.com).

In Illinois, fairy rings ("with or without mushrooms or toadstools") were evidence of fairy dancing (from a collection of early twentieth century lore, summarized in Hand 1981). And apparently there were Leprechauns still living under mushrooms or toadstools among the California Irish (Hand 1981). In the state of Georgia, a toadstool is the Devil's snuff-box and imps come at night for the snuff. "In the morning you can tell when the imps have been for the snuff, as you will find the toad-stool broken off and scattered about" (Steiner 1899). Such "snuff" was used in conjuring, "singly or in combination with graveyard dirt and other things," (Steiner 1901). Rolfe and Rolfe (1925) attributed the same term (Devil's snuff box) to stinkhorns, and they wrote that the term was applied to stinkhorns by "the coloured people in the vicinity of Washington, U.S.A."

Already noted above, under *Fungi and miraculous tales*, was an American version of Cinderella, ('Ashpet', in Chase 1948), in which fire is conveyed home by Ashpet in "an old dried toadstool".

Fungi in healing and ritual

Customs pertaining to fungi and health were also transplanted across the Atlantic. In Czech-American communities of the upper Mississippi valley, an effigy of Judas was burned on Easter Saturday, and on May Day the ashes and other remains were "planted in the fields, as a preventative against blight." The ceremony was said to have origins in Central Europe or Germany (Ryan 1956). The use of spores as a styptic apparently also traveled across the ocean: "Puffball fungus is used to stop nosebleeding" (North Carolina, in Hand 1961). More on styptics is provided below. The curing of ringworm in southeastern U.S. by rubbing the afflicted parts with silver, wedding rings, coins etc. (Hand 1961) probably reflects analogous customs in Ireland, in which ringworm was "cured" by rubbing the area with gold or silver coins (Mooney 1887).

Fungi in folkways for healing and prevention

Teas, infusions, diet

There are repeated instances of fungi used in, or in other instances cured by, miscellaneous teas and infusions or articles of diet.

One of the more popular remedies on the New Age circuit is Kompucha tea. (Try combining "New Age" and "Kombucha" or "Kompucha" on Google.) The origins of Kompucha tea or "Manchurian mushroom" tea are obscure, being variously documented as either Asian (Chinese, or Korean, then supposedly introduced to Japan) or Russian (Hobbs 1995). The name Kompucha itself may be a misnomer, whose original, more correct application was to a Japanese tea made from seaweed. Its use is presently widely distributed, especially in East Asia. It was introduced to Germany from Russia "about 1911" and miscellaneous publications document its use in Russia, the Caucasus, and the Baltic soon thereafter (Hobbs 1995). Kompucha is not a single microorganism, but a composite growth of several yeasts (including *Pichia fermentans*, *Kloeckera apiculata*, *Saccharomyces ludwigii* and *Schizosaccharomyces pombe*) and bacteria, primarily *Acetobacter* species. The tea has been used for "alleged successful treatments of a suspiciously large number of different kinds of illnesses" (Steiger and Steinegger 1957, cited in Hobbs 1995) and is more reliably credited with mild laxative properties. Since it is produced from black tea with sugar, it is no surprise that Kompucha is stimulating and mildly refreshing. Other skeptics have noted that reliable benefits may be confined to the effects of caffeine and sugar, but that growing such a "brew" at room temperature for several days presents hazards due to contamination (CDC 1995; Majchrowicz 1995).

Other, less contemporary, cures were derived from a largely European tradition. *Agaricus campestris* was stewed in milk to soothe cancer of the throat, and *Auricularia auricula-judae* (*A. auricula*) was boiled in milk to cure jaundice, or

used simply as a gargle for sore throats (Allen and Hatfield 2004). Thus the droll comment by Rolfe and Rolfe (1925) (see *Other aspects of fungi and folkways*, in which the latter fungus is associated both with the elder tree, and with Judas Iscariot): "Thus by a kind of poetic justice, the elder, by means of which Judas died of throat trouble, later provided a means of remedying indispositions of the same in others." Other jelly fungi, mostly *Tremella* spp., were used for a wide variety of medicinal purposes (malaria, warts, constipation and eye diseases to name a few) in Estonia (Jürgensen n.d.).

Fungus growths on mouth or hands (probably ringworm) were held cured by sassafras bark tea (Lathrop 1961). Other liquids, less tasty, were also useful. According to Cavender (2003) turpentine was used (hopefully only topically) as a cure for ringworm.

This is not the place for an extensive review of medicinal mushrooms and cancer therapy. Sullivan et al. (2006) provided a concise, contemporary synopsis. But, here we can note that the belief in the curative and/or preventative power of mushrooms, documented in an East Asian context by Sullivan et al., also pertains to some extent to Europe, e.g., "...stories that in some Central European countries people eating ... *Boletus edulis*, had very little cancer" (Wine 1955).

Poultices

"In various folklores and 'native medicine', mushrooms have long been thought curative or at least helpful for certain illnesses" and "we should remember that mushrooms are closely akin to ... those molds and soil fungi that are the source of penicillin, the different 'mycins' and others of our 'wonder drugs'" (Mowery 1955). In folklore of European countries, a poultice of moldy bread was good for external infections (Mowery 1955). There were analogous records for the New World: "Mouldy jam was used in rural areas of Quebec, Canada, and mouldy

bread was used in parts of Devon, and in Kansas, USA" (Wainwright 1989a, citing other sources); and the "traditional use of mouldy bread and milk to treat infections" was known in rural America (Wainwright 1989b). Moldy bread was one of many kinds of "general purpose" poultices in pioneer days of Western Kansas (Lathrop 1961). In Sussex, charcoal of *Piptoporus betulinus* was used as a disinfectant and antiseptic (Allen and Hatfield 2004), and strips of the fungus were used as corn pads (Allen and Hatfield 2004). In Coote Lake's (1959) synopsis of Gypsies' 'Penicillin' excerpted from the Sunday Times, are references to use of moldy materials (straw, cheese, apple, old leather, bread) to wounds, boils, etc. However, readers were cautioned about other instances in which 'mould' simply referred to soil, not specifically to fungal growth.

There are other interesting references. "The first slice of the Christmas loaf, which, it was said, would never mold, was never eaten but put away to make bread poultices for infected fingers" (note the implicit contradiction between absence of mold and healing power) (Voiles 1944). As cited above, several traditional stories from Europe involve the healing power of mold taken from Christ's grave or from graves in churchyards (Thompson 1955-1958). *Phellinus pomaceus*, ground and heated, was used as a poultice for facial swelling (Allen and Hatfield 2004), and *Fistulina hepatica* was applied to open ulcers in north-east Ireland (Allen and Hatfield 2004, citing William Sherard, a 17th century botanist).

Styptics

"Powder" from puffballs was recommended in John Wesley's *Primitive Physic* as a styptic (Trimmer 1965). Puffballs for staunching "all but the most profuse forms of bleeding" were documented in Allen and Hatfield (2004). From Isle of Axholme (Lincolnshire), "fuzz-ball" was used to stop bleeding (Rudkin 1933). This use was "probably very ancient" as evidenced by a collection of *Bovista nigrescens* excavated at Skara Brae in Orkney and puffballs strung up in

skeins by country surgeons of seventeenth century England (Allen and Hatfield 2004). Analogous practices followed by cottagers and villagers are recorded elsewhere, and the fungi were used on burns, warts, piles, carbuncles, chapped and chaffed parts, and even against tetanus (Allen and Hatfield 2004). Use of puffballs in medicine has a history in ancient (Dugan 2008) and medieval medicine. In the latter, a plaster of puffballs was applied to the foot for wart removal (Anderson 2004).

Other applications and afflictions

Multiple folk practices defy classification by the above scheme. One such concerns specimens of *Daldinia concentrica* (cramp balls, King Alfred's cakes), which were used to ward off cramps by being carried on one's person (Allen and Hatfield 2004).⁵ Chilblains in Anglesey were cured by rubbing with *Tremella mesenterica* (Allen and Hatfield 2004, citing Hugh Davies, an early botanist in Anglesey).

Fungal afflictions of the skin and mucous membranes often generated interesting folkways. In Finnish lore, tumors or boils were referred to as Hiisi's fungus, *Hiisi* being a malevolent devil or fiend (Abercromby 1890a). But, most references in folklore seem to be to ringworm, the infections stemming from the fungi known as dermatophytes. Thus, from Ireland: "Tradition has it that the seventh consecutive son in a family is born with the cure for ringworm" (Hutson 1957). "The 'doctor' ... was the youngest member of the profession I have ever laid eyes on, being then just one year old." His technique was essentially a wave of the hand, (plus a prayer by the doctor's assistant, his mother), and his fee was ten shillings. Other

"doctors" and their practices are described by Hutson (1957). Hand (1961) noted cures, principally from North Carolina, involving appropriate applications of buttermilk and salt, leeks and lard, walnut juice, water from a rotten stump, or use of metal: silver, wedding rings, pennies. Cures for ringworm ("charms") have a long history in Anglo-Saxon and Celtic folklore (see Dugan 2008), and such charms persisted well into modern times (Davies 1998). Some persons in Southern Appalachia consulted English translations of German charm books for these cures (Cavender 2003).

Thrush (yeast infection common in mouths of young children) was treated by the Cajun *traiteur* (folk healer) who specialized in laying-on of hands, sign of the cross, secret prayers etc., (Ancelet 1991). Hand (1961) contained many folk cures for thrush. Among them are various roots and other plant parts, teas, infusions, etc., (e.g., bark of slippery elm or persimmon, tansey tea), insects (worn as an amulet), rabbit brains (a perilous choice, as failure of this cure signified absence of the father's love), and toads (administered in contact with skin and mouth). Other cures involved the use of a corpse, urine in various forms (man's urine or father's urine), or other rather disagreeable procedures. Less appalling choices are simply breathing into baby's mouth, or presumably more effective, using the breath of specified persons: one who has never seen his father, a woman who marries without changing her name, etc. The seventh son motif cited directly above is echoed: "The seventh son of a family can cure thrash. Merely give the man the child's name and age." Cavender (2003) noted that black persons, especially those with darker complexions, were held by white persons to have exceptional abilities to cure certain disorders, e.g., thrush could be cured by riding on a horse with a black man, and ringworm cured by having a black woman spit on the affected area.

⁵ The reference to King Alfred's cakes doubtlessly originated from the famous legend wherein the King, without disclosing his royal identity, resided awhile in the house of a peasant. When asked to watch over the cakes in the oven, he was so preoccupied by affairs of state that he permitted them to burn and was thoroughly chastised by the peasant's wife.

Miscellaneous medicinal uses for lichens

Lichens, those engaging symbioses of fungi and algae, have been used as remedies. *Cladonia chlorophaea* (chalice-moss, cup-moss) was held effective against whooping cough, and recently was still in use in Wales (Allen and Hatfield 2004). It was also used in Ireland, boiled in milk. *Parmelia omphalodes*, used for brown dyes ('crottle' in British spelling), was also sprinkled on stockings to prevent inflamed feet in the Highlands; and as a cure for sores under the chin and for burns and cuts in Ireland; and was also used in a soup for invalids (Allen and Hatfield 2004). *Usnea* species (beard lichen) cured diseases of the scalp, "allegedly for no better reason than that its appearance recalls a head of long hair" and is still an ingredient in some anti-dandruff shampoos sold by drugstores; and in Ireland for sore eyes, mixed with tobacco and butter and applied as a lotion (Allen and Hatfield 2004). *Peltigera aphthosa* (sea-green lichen) was made into an infusion of milk, against thrush in children, and (in larger doses) as a purgative against intestinal worms. *Peltigera canina* (dog lichen) has fruit bodies resembling dog's teeth, and was a supposed antidote against rabies (in Caernorvonshire). *Lobaria pulmonaria*, recommended in 15th century herbals for lung complaints, including consumption, had a pitted surface resembling lung tissue. It is sold today by herbalists for asthma and bladder troubles, and to promote appetite. It was probably one of several lichens used by some Irish against piles. *Xanthoria parietina* is a yellow-colored lichen, probably one of several used against jaundice by consuming it boiled in milk (Allen and Hatfield 2004). This is a good example of sympathetic magic—the yellow medicine cures yellowness, and analogous examples are discernable above.

Other uses*Color and tinder*

Mushrooms and other fungi, including lichens, have been used for dyes (Bessette and Bessette 2001; Rice and Beebe 1980; Spooner and

Roberts 2005). Fungi were used in the former Yugoslavia for the traditional brown, golden and scarlet colors in Serbian and Croatian fabric designs (Lodge 1941). Putatively ancient folkways using fungi for dyes have been summarily reviewed (Dugan 2008; Spooner and Roberts 2005). Recent decades have witnessed renewed enthusiasm for this craft, with hobbyists discovering or re-discovering fungi useful for dyes and sharing results in craft newsletters e.g., Nelson et al. (2005). Although most literature on lichens pertains to their use by mere mortals, apparently fairies also made use of the dyes: "Although green seems to have been their popular colour, yet the fairies of the moon were often clad in heath-brown or lichen-dyed garments, hence the name of 'Elfin-grey' " (Thistleton-Dyer 1898).

Especially notable is the use of *Fomes fomentarius* for tinder and amadou (a felt-like substance), concisely reviewed by Spooner and Roberts (2005), and more extensively by Roussel et al. (2002). The birch polypore, *Piptoporus betulinus* had similar uses for starting or preserving fire. Frazer (1955, reprint of earlier editions) gave a good idea of the societal contexts: A "species of agaric [sic] which grows on old birch trees, and is very combustible," was used to initiate the Beltane fires of the Scottish Highlands. The Beltane fires were a "curious and interesting picture of ancient heathendom surviving in our own country" and may bear relation to the ritual burning of toadstools (*Bäran*) in analogous fire festivals in Sweden (Frazer 1955). The use of toadstools in this manner was to counteract the power of trolls. Morgan (1995) provided details on the probable species of fungus (*Tremella mesenterica*) and specific attributes of the trolls.

A fungus growing on birch was also used for tinder in the Finnish epic, the Kalevala. For instance, the aged primeval minstrel, Väinämöinen, captured fire thusly:

"Then he thrust the spark of fire
In a little piece of tinder,

In the fungus hard of birch tree,
And among the copper kettles"
(translation of Kirby 1907).

The Kalevala also noted the use of fungi for food, as in when the bear is admonished to leave cattle alone and be content with honey, roots, insects, and fungi. There is also the curious use of fungus for insertion into the nostrils of guard dogs, to keep them from scenting cattle. The Kalevala, a compilation of ballads presumably centuries old, but only arranged into a single work in the early part of the nineteenth century, is "Shamistic animism, overlain with Christianity" (Kirby 1907).

"Mushrooms" were also used for tinder by the southern Slavs for the lighting of bonfires, between which cattle were driven, and in some instances the dancing of a naked man or woman and/or the firing of guns completed the ritual (Kemp 1935). The fungi also had medicinal uses. *Fomes fomentarius* (and *Phellinus ignarius*, too) were indeed used for tinder, and the former was used in Suffolk to "staunch bleeding and cure slight wounds" (Allen and Hatfield 2004). We've seen above that use of fungi for tinder has made its way into folktales. In another example, a Magyar folk tale, the smallest of three brothers goes hunting with his elders, but he procures no game. However, in missing shots at birds, he obtains a piece of steel, a piece of flint, and an old fungus, and thereby has the means to produce spark and tinder, so fire can be made to cook the deer his brothers have killed (Brunvand 1959).

Pot-pourri et cetera

Fungi have played a role in various crafts. Spooner and Roberts (2005) have provided a concise review of how fungi have been used in paper (miscellaneous bracket fungi), perfumes (most notably certain lichens in the genera *Evernia* and *Pseudoevernia*), pot-pourri (certain polypores), ink (*Coprinus* species, "inky caps"), and wood-crafts (green stain from *Chlorociboria*

aeruginascens, or spalted wood produced by moderate decay from various polypores, or fungi in the Xylariaceae). The birch polypore, *Piptoporus betulinus*, was called the razor strop fungus. Rolfe and Rolfe (1925) concisely described the manufacture and use of the strops from Surrey and British Columbia.

Fungi were also used to quell or kill insects. "Formerly bee-keepers used ignited mushrooms for the purpose of smoking out bees, in fact some of the more conservative still use them. The variety used is *Lycoperdon Giganteum*..." The practice rendered bees more docile, or in stronger doses, "anaesthetises them completely" (Ellis 1946). Ellis (1946), in a section on use of *Amanita muscaria* as an intoxicant by Siberian tribes and Tartars, also noted that bits of the fungus "broken up in milk" have been used to kill flies "for centuries." See also Spooner and Roberts (2005) on this topic.

One of the more exotic uses of fungi was for predicting the weather. "If the 'spotty rot' - a type of fungus - was especially thick, a good hard freeze and accompanying cold spell sufficiently long to make possible the curing of hogmeat could be expected" (Davis 1969). "A lot of mushrooms popping up overnight warns you of rain" (Hyatt 1965); and mushrooms thus appearing constitute "a sure sign of rain within twelve hours" (Hand 1964, citing an Ozarks folkway collected by Randolph). "Mushrooms in November disclose a light winter," (Hyatt 1965).

Fungi were not just an interesting folk oddity in Lapland, as they are of extreme importance for the grazing of reindeer: "They are so fond of fungi that tending them in autumn is a very real problem, as ... they will bolt off in search of them," and the reindeer may "spread out looking for fungi and lose their way in bad weather and darkness," (Vorren 1962). Analogous difficulties from reindeer seeking out fungi are cited by Paine (1994), but the importance of fungi for fattening the deer in late summer is considerable (Ingold

1984). Lichens and mushrooms, especially Agaricaceae and *Boletus*, are the fungi most sought by the animals (Anderson 1978; Paine 1994). Interestingly, the Saami (one of the Lapp peoples) themselves do not partake of fungi, except for some bracket fungi which they use "as a coffee surrogate or additive" (Andersen 1978).

Impact of fungal imagery on Victorian and modern literature

Fiction, nonfiction, poetry

With respect to Victorian and modern literature, numerous American and British authors (usually of the nineteenth century, e.g., Keats, Tennyson, Emily Dickenson, Sir Arthur Conan Doyle) have used mushrooms to connote decay, rottenness or death, whereas others, usually more recent, have celebrated them as a source of wonder. The topic, with the above examples, has been reviewed in discursive form (Anon. 2006; Benjamin 1995; Wasson and Wasson 1957) and examples have been provided above along with more mycophilic examples from Russian tradition. Another instance, from the mycophobic British tradition and often quoted, is from D.H. Lawrence's *How Beastly the Bourgeois Is*:

"How beastly the bourgeois is
especially the male of the species—

Nicely groomed, like a mushroom
standing there so sleek and erect and eyeable—
and like a fungus, living on the remains of a
bygone life
sucking his own life out of the dead leaves of
greater life than his own."

The American Edgar Allen Poe, obviously heir to the British tradition of mycophobia, used fungi to accentuate "an atmosphere which had no affinity with the air of heaven, but which had reeked ... pestilent and ... sluggish. ... Minute fungi overspread the whole exterior, hanging in a fine tangled web..." (from *Fall of the House of Usher*). Jules Verne was ambivalent: "...here

were white mushrooms, nearly forty feet high, and with tops of equal dimensions ... beneath them reigned a gloomy and mystic darkness" (from *Journey to the Center of the Earth*).

The English writer H.G. Wells took a more sanguine attitude toward the fungi, at least toward those forming the subject of *The Purple Pileus*. His protagonist, Mr. Coombes, ingests some in an almost suicidal fit of despair, but finds the fungi not deadly. Instead, they are psychoactive and an excellent rejuvenator for his stagnant condition.

Lesser known examples include James Joyce's *Ulysses*, in which a witch milks a cow whilst seated on a toadstool (analyzed in Williams 1991), and Salman Rushdie's *The Moor's Last Sigh* (a "fairy tale about utopian worlds" - Deszcz 2004). The protagonist is begot soon after his parents meet an "old mushroom-selling crone" who is actually his father's mother (Deszcz 2004). With regard to children's literature, it would be remiss not to mention the series of *Mushroom Planet* books by Eleanor Cameron. In the first of the series, *Wonderful Flight to the Mushroom Planet* (1954), a rocket ship built by two boys travels to the mushroom planet, *Basidium*.

There have been several books sold with the title or subtitle *Destroying Angel* or *Destroying Angels*, but of course this designation has special meaning for mycologists, given the reputation of certain *Amanita* species sometimes given that common name. Apparently some of the effect has transferred to the popular consciousness. At least two books with this name (Lukasik 2006; Money 1985) actually feature gilled mushrooms on the cover. Lukasik's thriller, alas, features an *Amanita muscaria* instead of *A. phalloides* or other deadly *Amanita* species, but the photograph is impressive. (You guessed it: mushrooms are used for murder!) However, probably the most famous thriller employing mushrooms for murder is Dorothy Sayers' (1930), *The Documents in the Case*. Alas, Sayers also opted for *A. muscaria* as the toxic species. Reinert (1991, 1994, 1996) has

critiqued Sayers and other writers using toadstools in murder mysteries. The fungus on the cover of Money's documentary is not assignable to species, but is graphically engaging.

"Toadstool" as an invective in propaganda and journalism

Literature can also function as propaganda, benign or malign. The toadstool was used in folktales (Grimm) or classical literature (Petronius) as a symbol of detestation (see *Fungi and miraculous tales* above), and unsurprisingly, more recent literature and journalism put the toadstool to similar use. There is a famous example of the political exploitation of toadstool imagery in the caricature by James Gillray (1757-1815) of Pitt the Younger; Pitt is portrayed as a "Toadstool upon a dunghill" and has octopus-like tentacles attached to the bottom of the stipe! The image has been posted on miscellaneous on line sites, (New York Public Library, www.nypl.org; CSL Vintage Cartoons, www.cartoonstock.com; Wikipedia and others). [One wonders if familiarity with this cartoon added bite to "Wagner is the last mushroom on the dunghill of romanticism" - a grumpy assessment of the composer in Nordau (1895).] Fungi need not be poisonous or growing on dung to be used as instruments of political or social criticism. They can be used to imply buffoonery, rather than depravity. Isaac Sears, leader of the New York Liberty Boys, was satirized by a political opponent, John Vardill, in 1770. Vardill has Sears singing about himself to the tune of Yankee Doodle:

"My Mammy, when she carried me,
Dream'd of a wondrous something,—
She dream'd she bore a great *Mushroom*,
As large as any *Pumpkin*.
Yankee doodle, etc."
(Lemay 1976).

But the use of toadstool imagery can be quite sinister. A prime example has been analyzed by Mills (n.d.) and Wegner (2002): The love of mushroom hunting was deviously exploited by the Nazi propaganda book, *Der Giftpilz* (The Poisonous Mushroom), in which Jews were compared to poisonous fungi (Fig. 8). In *Der Giftpilz*, a mother teaches her son that just as bad mushrooms are sometimes difficult to distinguish from edible ones, bad people (Jews) can be difficult to differentiate from non-Jews.

Der Giftpilz was translated into English, accompanied by a forward warning readers as to its venomous nature, as early as 1938 (the year of its publication in German) as an example of the insidious nature of the Nazi program. The publisher of the original booklet (by Hiemer,



Fig. 8. A Jewish person caricatured as a toadstool, in *Der Giftpilz*, a Nazi propaganda book (Hiemer 1938).

1938), Julius Streicher, was a Nazi propagandist subsequently executed by the victorious allies as a war criminal.

With less venomous intent (or at least not so explicitly racist), was the political cartoon of H. Haynie from 1968, in which two American soldiers are on patrol in a field of giant fungi whose caps all resemble the *Nón lá*, the conical Vietnamese hat: "The mushrooms are South Vietnamese - they are good. The Toadstools are Viet Cong - they will kill you. You'll know it's a toadstool if it kills you" (reproduced in Emerson 1968).

Less objectionable, but still unsettling, is the comparison made by Kofahl (n.d.): "Does it matter what one believes? Yes it does. Many people have died horrible deaths because they believed that a poisonous toadstool was an edible mushroom." Evidence is then adduced that equally serious consequences await persons who mistakenly believe in evolution rather than creationism, and who accordingly lapse into libertine behavior resulting in "degenerating creation and race" (Kofahl n.d.).

The use of toadstool imagery for pro-creationist literature had precedent in *The Toadstool among the Tombs*, first published in 1925 by B.H. Shadduck; the cover and frontis-piece depict an evolutionist as a toadstool with thick eyeglasses (Fig. 9). The toadstool grows upon a grave (his own). The booklet contents leave the reader in little doubt that supposedly educated persons who believe in evolution have bad things in store for them. The booklet is available online with Shadduck's other booklets at www.creationism.org. Analogous, but un-illustrated, is the following: "Many parts of the teaching of false cults have to be true in order to seduce people, but the false parts are deadly. ... And remember: any good or any truth to be found in another religion will also be found in Christianity. Furthermore, only in true

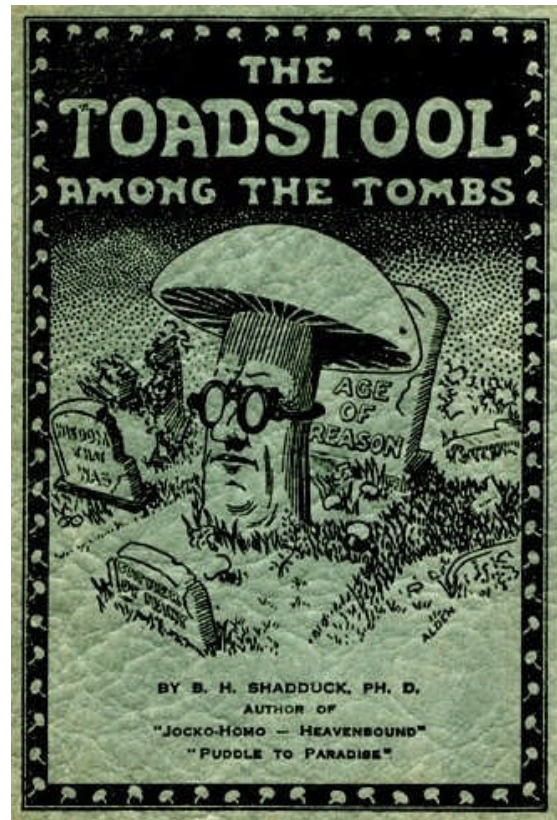


Fig. 9. An evolutionist caricatured as a toadstool, in *The Toadstool among the Tombs* (Shadduck 1925).

Christianity will this good or truth be found in its pure form, untainted with evil. (Such evil often appears deceptively harmless, like a beautiful, but deadly toadstool)" (Morris 1999). Toadstools emblematic of spiritual death have also been used to characterize the presumptive evils of women in church ministries, infant baptism, and abortion (Bousman 2005).

To be fair, it should be noted that the derogatory image of the toadstool had even earlier been exploited for progressive causes, i.e., the remark by Oliver Wendell Holmes describing the fakes and quacks selling patent medicines as "the mushroom, say rather, the toadstool millionaires" (Young 1961). Current rough and tumble political debate also exploits such imagery: "But we are now seeing the full depravity of President Clinton's moral character exposed. Stripped of its outer integuments of salacity and fraud, the inner

man is revealed as timid and niddering, lying to the last firm handshake and as sickly yellow as a poisonous toadstool" (Johnson 1999). Such examples could be multiplied, but there seems little doubt that the image of the poisonous mushroom is deliberately selected because it still elicits revulsion in the popular mind.⁶

Neopaganism, urban legends and more

Fungi have become integral to contemporary popular belief, at least in certain segments of alternative culture. Amongst some adherents of a New Age or neopagan affiliation, various putative impacts of fungi on human culture have become articles of faith. These putative impacts nearly always involve fungi producing psychoactive metabolites other than ethanol. For example, it is an interesting belief that the red and white costumes of Santa and/or the Catholic clergy have historical roots in rituals involving ingestion of *Amanita muscaria*. (Try combining "Santa Claus" with "*Amanita muscaria*" on Google.) The case of the clergy is briefly reviewed in Dugan (2008), with jolly Saint Nick treated more extensively below. Others of New Age or neopagan temperament count these opinions as error, as their preference for assigning such impacts resides with more modestly colored fungi in the genus *Psilocybe*. What is important here is not so much the evidence (or lack thereof) for generating such beliefs, but simply that such beliefs now comprise part of popular culture.

Santa and psychedelics

The putative connection between Santa and *Amanita muscaria* has been mentioned positively in a botanical newsletter (Anon. 2003), a presidential address for a mycological society (Edwards 1998), and, perhaps more

tellingly, in media devoted largely to *Cannabis* (Larsen 2003). This connection between Santa and *Amanita muscaria* is even alluded to in lectures on chemistry and agriculture (Pawelczyk 2006). In popular, street journalism we can read, "Does Santa wear a mushroom's colors?" (Campbell and Kroeger 1981). "Like Santa Clause the *Amanita muscaria* wears a red suit trimmed in white. Though the connections are circumstantial, they make for interesting speculation about the reasons for Santa's jolly nature." Morgan (1995) reviewed the topic, noting some resemblance between Santa and the Norse deity, Wotan. Some aspects of Wotan's character (flying through the sky in a vehicle pulled by animals, etc.) are reminiscent of Santa. Wotan's character is connected to *A. muscaria* because these mushrooms were held to spring up from droplets of blood shed by his steed (Morgan 1995). "[Jonathon] Ott, and also British anthropologist Rogan Taylor, suggested that Santa's clothing of red and white represented the fly agaric eaten by the [Siberian] shaman. His flight through the sky is shamanic, and the association with reindeer is reminiscent of the Koryak custom of eating the flesh of bemushroomed reindeer to get high. Modern mythology places Santa's homeland as Lapland, whose shamans consumed fly agaric, and surrounds him with elves (creatures normally linked with fungi in folklore)" (Morgan 1995). Interesting from an aesthetic perspective is art by Jimmy Bursenos (solsticestudios.net) as reproduced in Larsen (2003), with emphasis on *A. muscaria* and Santa.

Of course, *A. muscaria* has entered folk tradition in much less controversial ways. "There is a tradition on New Year's Eve in Germany, where 'Glückspilze' are offered. These are reproductions of *Amanita muscaria* in chocolate and marzipan, which are given as good luck presents" (Gerritsen 2000). The bestowal of good fortune is the purpose of an amulet of "a red fungus with white spots" as a German good luck charm (Wright and Lovett 1908). These and other benign folk uses of *A. muscaria* for good luck and simple fun were

⁶ Fungi continue to function on a less sinister level as major or minor villains in popular culture, e.g., Fungus Maximus is a nasty character in the children's animated film, *Barbie Mermaidia*. The character Fungus is an assistant to the primary villain in the animated film, *Monsters, Inc.*

reviewed by Hoffman and Hoffman (2001) and have made appearances on multiple web pages, blogs, etc., (Fig. 10).

Modern witches, neopagans and retro-fairies
Imagery illustrating the connection between fairies and mushrooms, latent in traditional folk belief and strongly reinforced by the literary and artistic biases of the Victorians, has persisted well into modern culture. A particularly well crafted example is the web site for the art of Howard David Johnson, a successful contemporary artist: "For more than six thousand years, the Faerie, the Toad, and the Mushroom have been associated with Shamanism and the ancient Pagan religions of Europe" (Johnson n.d.). Johnson's art prominently features fairies (mostly female and nubile) with mushrooms and toadstools, including *Amanita muscaria* and "magic mushrooms" (Johnson 2006).

Probably inevitable was integration of this imagery into video format, including aspects relevant to psychoactive fungi. "Because most video game creators are children of the 1960s, drug culture seems to play a subtle role in some of the games. For Mario [Super Mario Brothers video game] the people who aid the hero are mushrooms, just as 'magic' mushrooms ... aided Carlos Castaneda ... [with] mescaline (sic) ..." (Sherman 1997). Although Sherman attributed the wrong psychoactive ingredient to mushrooms, she accurately delineated the synthesis of Castaneda (see below), J.R.R. Tolkien, and Lewis Carroll that characterized much of 1960s and post-sixties culture. In Super Mario Brothers, we have "... quiet, peace-loving mushroom people" victimized by magic and their kingdom turned to ruin. Here, Princess Toadstool, daughter of the mushroom King is held captive. In the game, a certain kind of mushroom bestows additional life. Sherman placed her analysis in the context of folkloristic categories (see Aarne 1961 and Propp 1968;

Sherman cited the earlier editions in German and Russian).

Occasionally one finds examples of mushrooms used in contemporary witchcraft. Death cap (*Amanita phalloides*) was listed as an ingredient in martial sachet powders ("hex powders" which "should never be administered for consumption") of modern witches (Huson 1977; Tucker 1980). One web site (Spring Wolf n.d.) has a section on mushroom rings, which "were created by witches gathering and dancing ... Their energy left behind would create a 'fungus' and mushrooms would grow in their place." The same web site noted that Elizabeth Pepper's Witch's Almanac (this work has numerous editions) suggests that practitioners seek out a mushroom ring "for communion with



Fig. 10. An item from a collection of Glückspilze (Kristin La Flamme, <http://kristinlaflamme.com>, November 2006).

the energy left behind." To its credit, the site includes a strong warning on distinguishing poisonous from edible mushrooms. Bovenschen

et al. (1978) in their review of contemporary and historical witchcraft, wrote that the "lethal mushroom" belonged to black magic, as opposed to the healing herbs of white magic, in the tradition of European folk medicine, but cited no explicit documentation for this point.

One interesting example is not directly derived from Western tradition, but now has integrated with and influenced contemporary Western culture so much that it bears mention: the literary success of *The Teachings of Don Juan* (Castaneda 1968) and successive works by Castaneda. Derived (supposedly) from Yaqui Indian practices, these examples of "fake lore" (actually, syntheses of anthropological observations and literary invention) have had strong impact on American counter culture (Krantz 2006). The influence of Carlos Castaneda is felt in Europe, and has even impacted development of neopaganism in Russia (negatively in the opinion of one author: "consuming mushrooms without proper awareness" - Ferlat 2003). Even a cursory inspection of literature makes it apparent that the mycophilic Slavs are not immune from adverse side effects of such cultural influences. Experiments with toxigenic/hallucinogenic mushrooms have resulted in hospitalization in eastern Europe (Satora et al. 2005).

Environmental protest culture has also come under the influence of mushrooms, especially of the "magic" variety. These mushrooms, together with the omnipresent *Cannabis*, are the preferred substances of "eco-paganism" (eco-protest culture). Letcher (2001), writing about affairs in the U.K., was careful to state, "In most expressions of contemporary paganism, alcohol is the drug of first choice." But within certain forms of the protest movement, "psychoactive drugs are often preferred" as "natural." "Mushrooms have the added advantage of being acquired freely." Letcher noted, "The cultural association of fairies and fungi is deeply

ingrained in our culture: the pointed caps of the 'magic mushroom,' *Psilocybe semilanceata*, even resemble the pointed hats that fairies are usually portrayed as wearing" (Letcher 2001). The British eco-protest movement encompassed varying degrees of belief in actual fairies (literal belief, skepticism, disbelief) and, at least at the time, was divided into sub-tribal affinities: Fairies (non-violent, vegetarian) versus Trolls (carnivores, more given to heavy alcohol consumption) (Letcher 2001). This linkage between eco-protest, paganism and magic mushrooms (including "hallucinogenic earth bonding" and "scientific paganism") is also implicit in North American contexts (Taylor 2001). Times change, and it should be noted that "drug and alcohol free" events are now common in many New Age and neopagan circles, as attested by using these terms in any Google search.

Magic mushrooms used to explain world religions and higher consciousness

Some amateur ethnomycologists have offered up psychoactive fungi as an explanation for the root cause of spiritual experience in general and the resultant development of the great world religions (reviewed in Dugan 2008). Writings exemplifying a contemporary New Age perspective include Arthur's *Mushrooms and Mankind* (2000), a quixotic blend of extraterrestrials, Atlantis, secret societies and ethnomycology. Arthur's exposition of these interrelated themes, more stream of consciousness than analysis, is amply entertaining if somewhat diffuse in focus. Readers would do well to pay strong attention to his cautionary remarks on ingestion and dosage of *Amanita muscaria*. Heinrich (2002) represents a more scholarly approach, but although his organization of topics and analytical methods are more conventional, his conclusions are certainly outside the mainstream of academic scholarship. Like Arthur, Heinrich discerned the influence of ingestion of psychoactive *Amanita muscaria* in virtually all world religions. For the more cautious scholar, Heinrich's book is interesting for its presentation of some previously unpublished

illustrations of sculpture and art with representations of mushrooms, rather than for Heinrich's elaborate and radical conclusions. An earlier convert to the idea that mushrooms impacted consciousness (higher and otherwise), Rome (1959), presented a synthesis simultaneously academic and kaleidoscopic, combining Bosch- and Brueghel-like demons, dementia, and Walpurgisnacht, with mushrooms and folklore. Although Rome's contribution was well documented and the context academic (his knowledge of Bosch, Brueghel and other artists being quite commendable), his methods were somewhat analogous to those of Arthur (2000). [By contrast, Dixon (1984) used Bosch's paintings in a more focused analysis, demonstrating the impact of ergotism on late medieval and subsequent times, and detailing the interactions of ergot with the therapeutic use of mandrake, which contains belladonna. Her conclusions regarding the impact of fungi on belief systems are largely confined to certain aspects of the cult of St. Anthony and alchemical beliefs.] McKenna (1988) opted for extraterrestrial *Psilocybe* species as an explanation for the evolution of language and higher consciousness.

Fungal funnies, graffiti and urban legends

A compilation such as this would be incomplete without at least a sampling of contemporary jokes, graffiti and contemporary apocrypha:

One story has the family cat as "poisoned" by partaking of a family mushroom dish. The family is alarmed, both for the sake of the cat and because of the potential hazard to themselves. As it transpired, the cat was actually in labor with kittens (Hiscock 2002). This story has circulated as far as Germany and Romania (Brunvand 2000).

You can get high on great literature by sniffing the pages. Various sources on the web or in print journalism promote, or at least report, this concept, which apparently was first presented

tongue in cheek by Hay (1995) in a discussion of mycotoxigenic fungi in libraries. "It turns out that if you spend enough time around old books ... you can start to hallucinate. Really." (Sterling n.d., citing Chicago Tribune and other sources).

You may have thought that "cooties" was a term applied collectively to contagious arthropods such as lice, fleas, etc. (and indeed this can be the case), but in one source cooties were described as a type of fungus (Samuelson 1980). The epidemiology and management of cooties, as imagined and acted out by children, is extremely complex, with context dependent on social status and gender, etc. (Samuelson 1980).

A sampling of aphorisms, graffiti and slang:

Perhaps the most famous is, "Life is too short to stuff a mushroom" from Shirley Conran, a British designer and journalist (documented in Andrews et al. 1996). Nearly as famous would be, "Think I am a mushroom, because they keep me in the dark and feed me bullshit!" (documented in Dundes and Pagter 1987). Sexual connotations of mushrooms are sometimes manifest in rude graffiti - "Suck my mushroom" (from University of Southern California campus, Longnecker 1977). And from slang of teenagers in the 1950s: "Mushroom people - *night owls*" (Clar 1959).

And finally, one outright lie, perhaps destined to become an urban legend based on creativity and literary merit: "Harvard University was named after Sir Walter Montmorency Belgrave Harvard, who in 1689-1691 traveled by donkey through much of what is now western Massachusetts and parts of upper New York State, recording food terms in the languages of the local Indians. (He died after failing to take note of a critical phonemic distinction: q'opuhi 'asparagus' vs. qhopuhi 'species of deadly poisonous asparagus-shaped fungus'. So let's practice distinguishing ejective from aspirated stops, okay class?)" (Pullum 2003). Pullum apparently felt remorse after his web page was consulted by persons in search of "real information" and a disclaimer was

posted: "Absolutely nothing below that pertains to university naming is true. ... Sorry! Me and my deadpan humor. -- GKP"

Conclusions and postscript

The noted mycologist Bryce Kendrick (2000) titled his introductory mycology text, *The Fifth Kingdom*. The title conveys the biological importance of fungi, and their evolutionary equality with the other conventional Kingdoms: animals, plants, protozoa and bacteria. The word 'Kingdom' also captures, for the non-phylogenetic mind, something of the vastness and magic of life forms. Of course, it is no surprise that folklore incorporates innumerable references to plants and animals, and largely omits direct reference to protists and bacteria. Plants and animals dominate the visible farm, forest and field, but the protists and bacteria are nearly always microscopic (except for those pseudo-fungi, the slime molds). Fungi can also be microscopic, but even microscopic forms have, *en bloc*, visible form as mold or pronounced discoloration. Larger fleshy fungi, shelf-like conks, and lichens are nearly impossible not to notice, as are fairy rings in lawn or meadow. Although folklore does not assign to fungi an importance equivalent to animals or plants, fungi repeatedly form the context or substance of tales; they comprise the beds, tables, seats or umbrellas of elfin or fairy royalty as documented above. And as we have seen, the more mycophilic cultures endow fungi with meanings (culinary, sexual, aesthetic, and spiritual) that permeate their languages, literatures and cultures. The total range of folk interest and utilization of fungi documented herein is shown to be quite broad, a result congruent with ethnobotanical or ethnomycological studies for other, non-European cultures (e.g., Berlin et al. 1973; Garibay-Orijel et al. 2007; Hunn 1982; van Dijk et al. 2003; Zent et al. 2004).

Folklore makes reference to diseases caused by protists or bacteria in humans or animals (e.g.,

Drury 1985; Durham 1933; Rolleston 1943), and as we have seen, it repeatedly does the same with plant diseases caused by rusts, smuts, mildews or other microscopic fungi. The widespread bonfires and rituals intended for crop protection are implicit recognition of the power of fungi over economic plants. The widespread motif of the scald head testifies to the analogous ubiquity of fungal disease of humans and animals. We have also seen that misfortunes resulting from fungal infection in fields and gardens were, in conformity with the unfortunate spirit of the times, blamed on persons (mostly women) who conformed to the common conception of the witch. It is also the case that some "lepers" were actually suffering from fungal skin diseases, a point made by Kane (1997). Hence fungi were agents for plant, animal and human diseases, and in the context of prevailing superstition, fungi were also the precipitating cause for the profiling and persecution of witches and persons mistaken for lepers. As agents of human disease, fungi were also the source of prestige and revenue for miscellaneous conjurers and healers. [And don't forget the Church! Dixon (1984) gave an entertaining account of how no less than five complete skeletons of St. Anthony (and several incomplete ones) were used in various European locations to confer on wine the ability to cure ergotism. To its credit, the Papacy attempted to ban this use for counterfeit relics.] Moreover, as the above folktales of St. Peter and Christ demonstrate, fungi were also a source of nutrition known to the common folk.

Readers lacking prior acquaintance with folkloristic studies will by now appreciate that much folklore can be accessed via catalogs of motifs, types and other aspects (e.g., Aarne 1961; Briggs 1976; Propp 1968; Thompson 1955-1958; Uther 2004) as well as via the classic collections of Afanesiev, Calvino, the Brothers Grimm, Perrault, and many others. Readers lacking a prior mycological perspective should be aware that many of the fungi mentioned in this study continue to be of interest to scientists (e.g.,

mycologists, biotechnologists, clinicians) as well as to amateur mushroom hunters, many of whom are highly competent at identification of the species of interest to them. These fungi are, of course, addressed in detail by mycological literature. [Dugan (2006) provided an introduction to the identification of fungi, and gave pertinent citations for mushroom books and other literature.] Also, well documented physical specimens of these fungi can be located for study in numerous mycological herbaria (listed in Holmgren et al. 1990). Living cultures (fungal germplasm) of the fungi mentioned herein can often be ordered from culture collections (see Babcock et al., 2007).

On the surface, folkways (including fairy tales, myths and legends) center on heroes, tricksters, villains, kings, princes and princesses, magic animals and the like. As is apparent from the preceding discussion, folklorists have devised their own taxonomies, and as with mycologists, there are plenty of debates about which systems are the most accurate or useful. Folktales are categorized by folklorists as animal tales, tales of magic, jokes and anecdotes, etc., and folktale motifs and types are classified into literally thousands of categories (Aarne 1961; Propp 1968, 1984; Thompson 1955-1958; Uther 2004). Of course, folktales (and especially fairy tales) have also been analyzed from miscellaneous other perspectives, including psychoanalytic (e.g., Bettelheim 1976), Jungian and feminist (e.g., von Franz 1972; Zipes 1994), and socio-economic (e.g., Weber 1981). In most of these viewpoints, the importance or role of fungi is absent or obscure. Nonetheless, we can see from the documentation in this compilation that fungi make a substantial contribution to western folklore. This contribution, as viewed from an admittedly myco-centric bias, encompasses more folklore than do the small number of indexed tales and motifs directly assigned to fungi by folklorists. The taxonomy of folklore, understandably, does not parallel biological taxonomy. The closest approximations are the

folkloristic categories of animal tales, but most folkways involving other organisms are distributed into multiple, non-biological tales or motifs. This present work, together with Dugan (2008), provides a more encompassing, albeit still introductory, guide to the extended role of fungi in folklore and other folkways. The fungi indeed comprise a biological kingdom, and they also hold sway over an extensive realm in art, legend, lore and literature.

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