Spectrum Materia Medica
Volume 2

Frans Vermeulen

Emryss Publishers

‘White Rabbit’
Grace Slick
(1967, from *Surrealistic Pillow,* Jefferson Airplane)

One pill makes you larger
And one pill makes you small
And the ones that mother gives you
Don’t do anything at all
Go ask Alice
When she’s ten feet tall
And if you go chasing rabbits
And you know you’re going to fall
Tell 'em a hookah smoking caterpillar
Has given you the call
Call Alice
When she was just small
When the men on the chessboard
Get up and tell you where to go
And you’ve just had some kind of mushroom
And your mind is moving low
Go ask Alice
I think she’ll know
When logic and proportion
Have fallen sloppy dead
And the White Knight is talking backwards
And the Red Queen’s off her head
Remember what the dormouse said
Feed your head
Feed your head
Feed your head

Dedicated to the fine work undertaken by HZG -
Homeopaten Zonder Grenzen.
Homeopaths Without Borders

in sowing their homeopathic spore
far and wide.

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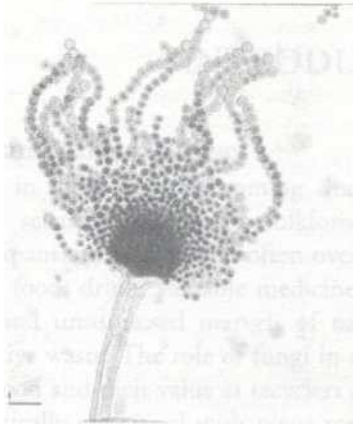

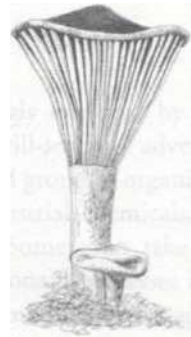

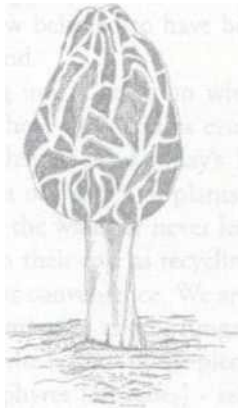

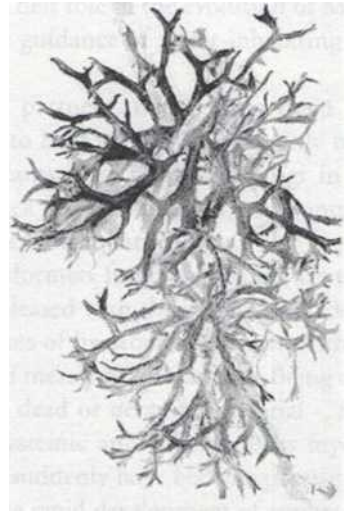

INTRODUCTION

Fungi and fungal diseases

Interest in fungi is mushrooming. Increasingly explored by mycologists, medical scientists, gourmets, folklorists, thrill-seeking adventurers, and mind-expansionists alike, this often-overlooked group of organisms provides us with food, drink, valuable medicines, industrial chemicals, recreational drugs, and unsurpassed marvels of nature. Some even take care of our radioactive waste. The role of fungi in evolutionary processes is now better understood and their value as recyclers and symbionts better appreciated.

Symbiotically associated with plant roots, fungi distribute essential nutrients, thereby transforming inhospitable environments into hospitable ones and enabling plants to settle and grow. Their role in the evolution of Mother Earth is now believed to have been the guidance of water-inhabiting algae onto dry land.

By entering into a coalition with algal partners and allowing them to be dominant these consortiums evolved into land plants. It is certainly no coincidence that 95% of todays land plants have symbiotic fungi in their roots. [Most of the 5% of plants that lack persistent fungal symbionts have returned to the water or never left it; they are aquatic plants.]

However, in their role as recycling transformers fungi are not always to our advantage or convenience. We are not pleased with the increasing incidence of medical mycoses and of fungal diseases of livestock and crops. Although regarded as the villains of the piece, fungi merely play their part. Being essentially saprophytes [saprobes] - recycling dead or decaying material -, fungi, then termed "opportunists," produce systemic and subcutaneous mycoses. During the last 50 years or so saprobes "suddenly have become parasitic and pathogenic," which is probably due to the rapid development of antibacterial, antineoplastic and immunosuppressive drugs.

"A dramatic change in the epidemiology of infectious diseases has taken place with the advent of new chemotherapeutic agents, new immunosuppressive agents, organ transplantation, parenteral alimentation, broad

spectrum antibiotics, and advanced surgical techniques. In this new scenario, fungal infections have emerged as a critical issue in the compromised host." [www. doctorfungus. org]

In unhealthy functioning ecosystems fungus-plant interactions result in disease. Disruption of human immune systems has similar damaging consequences. The maintenance of agricultural monocultures with large-scale use of fertilizers and pesticides as well as the breeding of new crop varieties by genetic manipulation has resulted in significantly decreased resistance of crops to fungal infestation, which, in turn, causes a steep rise in both mycotoxin levels and spore production. A major cause of hypersensitivity [allergic] reactions, both out and indoors the air is filled with spores and other fungal elements. In addition, eczema, chronic digestive problems, acute diarrhoea, and irritable bowel syndrome have all been associated with the ingestion of the products of mould fungi.

In nature much of the effort of fungi goes into undoing the human disruptions of ecosystems. For undoing the disruptions of human immune systems likewise fungi can be employed, to which the ancient history of the use of medicinal fungi as immunostimulants in the Far East bears adequate witness.

Fungal remedies

The various repertories and homeopathic encyclopaedias list 72 names of fungal remedies [fungal compounds included]. Of these, 32 fungi are represented in the abbreviation lists by nothing more than a name, i.e. there are no symptoms, whilst of the remaining 40 fungi 27 have less than twenty symptoms. It leaves us with 13 fungi we might possibly come across when repertorizing. Yet, even that number does not reflect the actual situation. Our understanding of the entire kingdom is based in essence on a total of *three* fungi: Agaricus, Bovista, and Claviceps [Secale], with a few more having a place in the background: Psilocybe, Ustilago, Sticta, Polyporus officinalis, Candida albicans, and the fungal compounds Alcoholus and Penicillinum. This well-known trio supplies the rudiments, the basics, the ABC of the homeopathic perception of the kingdom. One may safely assume that such a foundation is too narrow.

To broaden the horizons - admittedly, my own in the first place - I have spent some years studying the biology of fungi and collecting evidence from the dusty corners of homeopathy. All gathered material I have put together to

come to a working hypothesis designed to enable pattern recognition. Emphasis is placed on the biological features of the individual fungus, based on the conviction that similarity is a matter of analogy between the nature of the substance and the nature of the person. Defining homeopathy as a process of cause and effect ["What can cause can cure"] seems to me too limited and too limiting.

Keys

The process of researching and dusting has resulted in *keys* for the individual fungi. The keys are combinations of mycological and toxicological data, medicinal use, culinary delights, fungal lore, thematic concepts, peculiar properties, and homeopathic symptoms [where available]. The keys are meant as *potential* indications; they cannot be conclusive since clinical verification is lacking for most of the 109 fungi and fungal compounds included in *Spectrum.* As already stated 32 have an abbreviation only; 27 have twenty or less symptoms, and 37 are new.

Dealing with the *Kingdom Fungi, Volume 2* of *Spectrum* presents an orientation in this fascinating but arcane kingdom. It includes drug pictures, rudimentary or more complete, with a range of analogous information [signatures] as its points of departure.

The kingdom Monera [including the kingdom-less viruses] has been discussed in *Volume 1;* the remaining kingdoms - protists, plants, animals, elements - will be presented in subsequent volumes of *Spectrum.*

Enigmatic species

Some fungi, as presented in remedy abbreviation lists or actually existing as homeopathic remedies, have remained obscure regarding their taxonomy or their potential health benefits. These include:

- *Cladosporium lugdunense* [abbr.: *Clados-ll*\. Obviously an organism of French origin [lugdunense means 'from Lyon'], yet non-existent under this name within Cladosporium, a genus of ubiquitous moulds. Cladosporium spp. grow on deteriorating plant materials - some even thrive on vegetables stored in refrigerators - and discharge such huge numbers of spores that they are among the commonest causes of fungal allergies.
- *Monilia coerula* [abbr.: *Moni-c.*\. The genus Monilia originally comprised a group of organisms that are now placed in the separate genus *Candida.* Equally stubborn as erroneous, homeopathy persists in holding on

to the old classification. Since there are no references to a fungus named *Monilia coerula,* it might reflect the old situation and really be a Candida species. In that case the only candidate is Candida krusei var. coeruleum [now shortened to Candida krusei], *[See* Candida albicans]. On the other hand, if the specific name 'coerula' is conclusive, there are several other candidates, such as the moulds Absidia coerulea and Fusarium coeruleum.

• *Hydnum repandum* [abbr.: *Hydn-r.].* With Hydnum the problem is not so much its taxonomy, but more the absence of any reported adverse or beneficial effects. An esteemed edible mushroom, it appears to be totally harmless, despite a slight occasional gastrointestinal upset when eaten raw. Its signature is interesting, though. It belongs to a group of fungi that have *teeth* , rather than gills or pores, [actually brittle but soft needle-shaped spines], to which its alternate name *Dentinum* repandum refers, and, with some imagination, it resembles a hedgehog [Hedgehog Mushroom]. Hydnum repandum has no history of medicinal use, as far as I could ascertain.

• *Lactarius deliciosus* [abbr.: *Lacta-d.].* A delectable edible loved by the ancient Greeks, the Russians still go bananas over Milk Caps. Russia has been called the Milk Cap Mecca. Belonging to the family Russulaceae, Milk Caps share with Russulas certain brittleness and a distinct display of colours. As the name indicates, the discharge of a milky latex when broken or cut distinguishes them from the 'dry' Russulas. Lactarius deliciosus causes gastrointestinal disturbances when eaten raw. The sesquiterpenes contained in Milk Caps are mostly destroyed on cooking. Sesquiterpenes are responsible for the bitterness or pungency of some Milk Caps and increase digestive secretions. Although Lactarius deliciosus is mild tasting, suggesting low levels of sesquiterpenes, the invigorating and appetite-inducing effects of these compounds, might explain why both this species and L. piperatus [Peppery Milk Cap] in the mid-19*^ century had such a reputation in the treatment of pulmonary tuberculosis. It has also been claimed that this use is supported because of the strong antibacterial activity present in some Lactarius species. Unfortunately, these testimonials in the older literature didn't catch lasting attention, so that the therapeutic value of Lactarius spp. is now replaced by culinary praise.

Believing is seeing

The doubting Thomas wanted to see first and then believe, as do some homeopathic practitioners. Such a concept is like the snake that bites its own tail: a vicious circle. That it is all about perspective is illustrated by Andrew Weil's story "Believing is Seeing." Replace the words 'mushroom' or 'morel' in the story by the word 'remedy,' and see what you see ...

Mushroom hunting can teach us a lot about the larger world. A common experience of mushroom hunters is not being able to see a particular mushroom when they first try to collect it. It's not a question of visual acuity, but of pattern recognition. One woman wanted to find morels. She'd been told they grew in her area, but nobody would show her exactly *where,* and she had never seen one in the flesh. So finally she went out by herself to the woods and spent an entire morning looking, without finding a single morel. In frustration she got down on her hands and knees and began sifting through last year's leaves. Just as she was about to give up, she saw one morel a few inches away, and picked it. Clutching it triumphantly, she looked up and saw *hundreds* of them scattered through the woods in all directions.

A useful lesson can be drawn from this: that our brain acts as a filter, screening out what it doesn't consider significant. A certain "key" has to be in place before our brain can say "Aha!" and recognize something. And of course, what we recognize has real consequences. In this case, the person who can see the morels gets to put them in the basket and take them home to eat. The larger principle is that what we experience is determined by what we are able to perceive. It leads me to believe that we should be willing to accept other people's experiences - for instance, telepathy or pre-recognition - or at least *consider* that they have validity, even though we do not share them. Otherwise we could live in a forest full of morels and never see them.

[Cited in David Arora, *All That the Rain Promises and More ...]*

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Frans Vermeulen, Molkom, Stoeden, 24 April, 2006.

CLASSIFICATION KINGDOM FUNGI

[A true "nomenclatural nightmare", the taxonomy of fungi is subject to ongoing debate, "riddled with contradictions", and unresolved disputes. Of the 200,000 species of fungi estimated to exist, about 70,000 have been described, the lion's share of which consists of microscopic fungi such as yeasts and moulds. For the nomenclature and the author citations, standardised to follow Brummit & Powell (1992), I am indebted to Dr Vilma Bharatan, Department of Botany, Natural History Museum London. Synonyms indicate old names, now mostly obsolete, or names currently used in mycological literature but without official nomenclatural status.
The classification given below is mainly based on Bryce Kendrick's authoritative *T he Fifth Kingdom.]*

Fungal nomenclature in homeopathy

Elias Fries [1794-1878] based his classification system on macro morphological features of fungi, placing every gilled fungus into the genus Agaricus and every pored fungus into Boletus. Later he subdivided the latter group and placed the fleshy species into Boletus and the corky or woody ones into Polyporus. The Friesian system of classification prevailed for over a hundred years but is now replaced by systems that distinguish genera and species on the basis of microscopic characteristics. The names used in homeopathy follow the Friesian system: all gilled mushrooms are called Agaricus, all pored species are either Boletus or Polyporus.

PHYLUM EUMYCOTA ["True Fungi"]

The higher or true fungi constitute a single phylum, the Eumycota, which includes two subphyla, Ascomycota and Basidiomycota. In some classification systems the Deuteromycota [Imperfect Fungi] are included as a separate subphylum of the Eumycota, as are the Mastigomycota and the Zygomycota. The Mastigomycota, consisting predominantly of aquatic fungi or fungi that flourish under particularly damp conditions, is divided into three classes:

Chrytridiomycetes, Hyphochytridiomycetes and Oomycetes. In other systems the three classes of the Mastigomycota as well as the Zygomycota are treated as four separate phyla of the lower fungi. The latter system is adapted below.

SUBPHYLUM BASIDIOMYCOTA [Club Fungi]
Contains approximately 25,000 known species, mostly terrestrial and *extensive in growth.* Most of the large, conspicuous fungi encountered in woods and fields, such as mushrooms, puffballs, stinkhorns, and bracket fungi belong to the basidiomycota. In addition the subphylum includes numerous inconspicuous forms, many of which are plant parasites. The spores, usually four, are borne on the outside of a club like cell [basidium], usually in a fruiting body. Basidiospores develop externally and, when mature, are often shot from the basidium, usually with a force sufficient to carry them free of the spore-producing tissue.
The subphylum comprises three classes: Holobasidiomycetes, Phragmobasidiomycetes, and Teliomycetes. The class Holobasidiomycetes is subdivided in two highly interrelated series, called Gasteromycetae and Hymenomycetae.

- CLASS: Holobasidiomycetes

- SERIES Gasteromycetae [Gasteromycetes]

- ORDER: Lycoperdales [Puffballs and Earth Stars]
  - FAMILY: Lycoperdaceae
    - GENUS: Bovista
      - SPECIES: *Bovista nigrescens*
    - GENUS: Calvaria
      - SPECIES: *Calvatia bovista*
        Calvatia gigantea
        [syn Langermannia gigantea]
    - GENUS: Lycoperdon

- ORDER: Phallales [Stinkhorns]
  - FAMILY: Phallaceae

- GENUS: Phallus
  - SPECIES: *Phallus impudicus*
- ORDER: Sclerodermatales
  - FAMILY: Sclerodermaceae
    - GENUS: Scleroderma
      - SPECIES: *Scleroderma citrinus*

- SERIES Hymenomycetae [Hymenomycetes]

- ORDER: Agaricales
  - FAMILY: Agaricaceae
    - GENUS: Agaricus
      - SPECIES: *Agaricus bisporus*
        Agaricus blazei Agaricus campestris

  - FAMILY: Amanitaceae
    - GENUS: Amanita
      - SPECIES: *Amanita citrina* [horn.: Agaricus citrinus]
        Amanita muscaria [horn.: Agaricus muscarius] *Amanita pantherina* [horn.: Agar pantherinus] *Amanita phalloides* [horn.: Agaricus phalloides] *Amanita rubescens* [horn.: Agaricus rubescens] *Amanita verna* [horn.: Agaricus vernus]

  - FAMILY: Coprinaceae
    - GENUS: Coprinus
      - SPECIES: *Coprinus atramentarius*
    - GENUS: Panaeolus
      - SPECIES: *P. campanulatus* [horn.: Agar, campanulatus]

  - FAMILY: Cortinariaceae
    - GENUS: Cortinarius
      - SPECIES: *Cortinarius orellanus*
    - GENUS: Gymnopilus
      - SPECIES: *Gymnopilus spectabilis*

- FAMILY: Lepiotaceae
  - GENUS: Lepiota
    - SPECIES: *Chlorophyllum molybdites*
      Macrolepiota procera [hom.: Agaricus procerus]

- FAMILY: Paxillaceae
  - GENUS: Paxillus
    - SPECIES: *Paxillus involutus*

- FAMILY: Russulaceae
  - GENUS: Lactarius
    - SPECIES: *Lactarius deliciosus*
  - GENUS: Russula
    - SPECIES: *Russula emetica* [hom.: Agaricus emeticus]
      Russula foetens

- FAMILY: Strophariaceae
  - GENUS: Psilocybe
    - SPECIES: *Psilocybe caerulescens*
      Psilocybe semilanceata
  - GENUS: Stropharia
    - SPECIES: *Stroph. semiglobata* [hom.: Agar, semiglobatus]
      Stroph. stercoraria [hom.: Agar, stercorarius]

- FAMILY: Tricholomataceae
  - GENUS: Armillaria
    - SPECIES: *Armillaria mellea*
  - GENUS: Lentinula
    - SPECIES: *Lentinula edodes* [Shiitake]
  - GENUS: Omphalotus
    - SPECIES: *Omphalotus illudens*
  - GENUS: Pleurotus
    - SPECIES: *Pleurotus ostreatus* [Oyster mushroom]

ORDER: Aphyllophorales
- FAMILY: Ganodermataceae

- GENUS: Ganoderma
- SPECIES: *Ganoderma lucidum* [Reishi]

- FAMILY: Polyporaceae [Conks]
  - GENUS: Fomitopsis
    - SPECIES: *F. officinalis* [hom. Polyporus officinalis] [syn. Laricifomes officinalis; hom.: Boletus laricis]
      Fomitopsis pinicola [hom. Polyporus pinicola]
  - GENUS: Grifola
    - SPECIES: *Grifola frondosa*
  - GENUS: Inonotus
    - SPECIES: *Inonotus obliquus* [syn. Polyporus obliquus]
  - GENUS: Piptoporus
    - SPECIES: *Piptoporus betulinus*
  - GENUS: Pycnoporus
    - SPECIES: *Pycnoporus sanguineus*
  - GENUS: Trametes
    - SPECIES: *Trametes versicolor*
      Trametes suaveolens [hom.: Boletus suaveolens]

- ORDER: Boletales
  - FAMILY: Boletaceae
    - GENUS: Boletus
      - SPECIES: *Boletus edulis*
        Boletus luridus
        Boletus satanas

- ORDER: Cantharellales
  - FAMILY: Cantharellaceae [Chanterelles]
    - GENUS: Cantharellus
      - SPECIES: *Cantharellus cibarius*

- ORDER: Hymenochaetales
  - FAMILY: Hymenochaetaceae
    - GENUS: Phellinus
      - SPECIES: *Phellinus nigricans*

CLASS: Phragmobasidiomycetes

ORDER: Auriculariales
- FAMILY: Auriculariaceae
  - GENUS: Auricularia
    - SPECIES: *Auricularia polytricha*

ORDER: Tremellales [Jelly Fungi]
- FAMILY: Filobasidiaceae
  - GENUS: Filobasidiella
    - SPECIES: *Cryptococcus neoformans*
      [anamorph of Filobasidiella neoformans]
  - GENUS: Pityrosporum [syn. Malassezia]
    - SPECIES: *Pityrosporum orbiculare*

- FAMILY: Tremellaceae
  - GENUS: Tremella
    - SPECIES: *Tremella fuciformis*

CLASS: Teliomycetes

ORDER: Ustilaginales [Smut Fungi]
- FAMILY: Sporidiobolaceae
  - GENUS: Sporobolomyces
    - SPECIES: *Sporobolomyces roseus*
      Sporobolomyces salmonicolor

- FAMILY: Ustilaginaceae
  - GENUS: Ustilago
    - SPECIES: *Ustilago maydis* [Corn Smut]

SUBPHYLUM ASCOMYCOTA [Sac Fungi],

Contains more than 30,000 known species, mostly terrestrial and saprophytic, occurring on plant and animal remains, on dung, or in soil. *Extensive in growth.* Some species are parasitic on plants. Spores, usually eight, are borne inside a bladder like sac [ascus], which is the characteristic sexual reproductive structure of the ascomycetes. There is no universally accepted classification of the Ascomycota. Here is adopted the subdivision into the classes Ascomycetes and Saccharomycetes. The class Ascomycetes is divided into four series, depending on the structure of the asci, as reviewed by Kendrick.

1. Unitunicate-Operculate Asci have a single wall with a built-in lid or operculum at the tip. At maturity the lid pops open to eject the spores.
2. Unitunicate-Inoperculate Asci lack an operculum but have instead an elastic ring mechanism, letting the spores shoot through at maturity.
3. Prototunicate Asci have no active spore-shooting mechanism; the spores are released when the walls of the asci dissolve, decay or rupture.
4. Bitunicate Asci have a double wall. At maturity the thin outer wall splits, and the thick inner wall absorbs water and expands upward, carrying the ascospores with it.

- CLASS: Ascomycetes.

- SERIES *Unitunicatae-Operculatae.*

- ORDER: Pezizales.
  - FAMILY: Discinaceae [Helvellaceae].
    - GENUS: Gyromitra [False Morels].
      - SPECIES: *Gyromitra esculenta* [Brain Mushroom].

  - FAMILY: Morchellaceae.
    - GENUS: Morchella [Morels].
      - SPECIES: *Morchella esculenta* [Yellow Morel].

  - FAMILY: Tuberaceae [Truffles],
    - GENUS: Tuber.
      - SPECIES: *Tuber aestivum* [Summer truffle],

Tuber magnatum [White truffle of Piedmont], *Tuber melanosporum* [Black truffle of Perigord].

- SERIES *Unitunicatae-Inoperculatae.*

- ORDER: Clavicipitales.
  - FAMILY: Clavicipitaceae.
    - GENUS: Claviceps.
      - SPECIES: *Clavicepspurpurea* [hom.: Secale cornutum].
    - GENUS: Cordyceps.
      - SPECIES: *Cordyceps militaris.*
        Cordyceps sinensis.
        Cordyceps subsessilis
        [teleomorph ofTolypocladium inflatum, producer of Cyclosporin],
    - GENUS: Epichloe
      - SPECIES: *Neotyphodium lolii* [endophyte of the grass Lolium temulentum]

- ORDER: Hypocreales.
  - FAMILY: Hypocreaceae.
    - GENUS: Fusarium.
      - SPECIES: *Fusarium graminearum.*
        Fusarium oxysporum.
        Fusarium sporotrichioides.

  - FAMILY: Nectriaceae.
    - GENUS: Nectria.
      - SPECIES: *Nectria ditissima.*

- ORDER: Leotiales.
  - FAMILY: Sclerotiniaceae.
    - GENUS: Botrytis.
      - SPECIES: *Botrytis cinerea.*

- ORDER: Microascales.
  - FAMILY: Microascaceae.

- GENUS: Pseudallescheria.
  - SPECIES: *Pseudallescheria boydii.*
    [hom.: Acladium castellani]
- ORDER: Sordariales.
  - FAMILY: Lasiosphaeriaceae.
    - GENUS: Arthrinium.
      - SPECIES: *Arthrinium arundinis.*

- SERIES *Prototunicatae.*

- ORDER: Eurotiales [green and blue moulds].
  - FAMILY: Trichocomaceae.
    - GENUS: Aspergillus.
      - SPECIES: *Aspergillus bronchialis.*
        A. candidus [hom.: Sterigmatocystis candidum] *Aspergillus flavus.*
        Aspergillus fumigatus.
        Aspergillus niger.
    - GENUS: Penicillium.
      - SPECIES: *Penicillium camemberti.*
        Penicillium cyclopium.
        Penicillium expansum.
        Penicillium \aurantio\griseum.
        Penicillium griseofulvum.
        Penicillium notatum.
        Penicillium piceum.
        Penicillium roqueforti.

- ORDER: Onygenales.
  - FAMILY: Arthrodermataceae.
    - GENUS: Trichophyton.
      - SPECIES: *Trichophyton mentagrophytes*
        [hom.: T. depressum].
        Trichophyton persearum [hom.: T. persicolor].
        Trichophyton rubrum.
        Trichophyton tonsurans.

- FAMILY: Onygenaceae.
  - GENUS: Blastomyces.
    - SPECIES: *Blastomyces dermatitidis.*
  - GENUS: Coccidioides.
    - SPECIES: *Coccidioides immitis.*
  - GENUS: Geomyces.
    - SPECIES: *Geomyces pannorum*
      [hom.: Aleurisma lugdunense]
  - GENUS: Histoplasma.
    - SPECIES: *Histoplasma capsulatum.*
  - GENUS: Paracoccidoides.
    - SPECIES: *Paracoccidoides brasiliensis.*

ORDER: Ophiostomatales.
- FAMILY: Ophiostomataceae.
  - GENUS: Sporothrix.
    - SPECIES: *Sporothrix schenckii.*

SERIES *Bitunicatae.*

ORDER: Dothideales.
- FAMILY: Dematiaceae.
  - GENUS: Stachybotrys.
    - SPECIES: *Stachybotrys chartarum.*

- FAMILY: Dothioraceae.
  - GENUS: Aureobasidium.
    - SPECIES: *Aureobasidium pullulans.*
  - GENUS: Hortaea.
    - SPECIES: *Hortaea werneckii.*
      [hom.: Cladosporium metanigrum]

- FAMILY: Pleosporaceae.
  - GENUS: Alternaria.
    - SPECIES: *Alternaria alternata.*

- CLASS: Saccharomycetes.

- ORDER: Endomycetales [Saccharomycetales].

  - FAMILY: Ascoideaceae.
    - GENUS: Candida.
      - SPECIES: *Candida albicans* [hom.: Monilia albicans].
        Candida kefyr.
        [anamorph of Kluyveromyces marxianus] *Candida parapsilosis.*

  - FAMILY: Saccharomycedaceae.
    - GENUS: Kloeckera.
      - SPECIES: *Kloeckera apiculata*
        [hom.: Saccharomyces apiculata]

  - FAMILY: Saccharomycetaceae [Yeasts].
    - GENUS: Kluyveromyces.
      - SPECIES: *Kluyveromyces lactis.*
        Kluyveromyces marxianus.
        [teleomorph of Candida kefyr]
    - GENUS: Saccharomyces.
      - SPECIES: 5. *carlsbergensis* [hom.: Cerevisia lager],
        5. *cerevisiae* [hom.: Torula cerevisiae].

SUBPHYLUM DEUTEROMYCOTA [Imperfect Fungi]

Imperfect fungi - fungi lacking sexual stages or having lost the ability to reproduce sexually - were traditionally grouped together in the artificial taxon Deuteromycota. For example, asexual Ascomycota, such as Penicillium, Aspergillus or Candida species, used to be classified separately in the Deuteromycota, but have now been integrated into the Ascomycota. Fungal species whose status is yet to be determined and hence have not yet been placed in the existing divisions are grouped together in the “orphanage”, also called “holding group” known as the Imperfect Fungi. Deuteromycetes are mostly terrestrial and *extensive in growth.*

SUBPHYLUM LICHENES [Lichens]
Lichens are symbiotic associations, mostly of Ascomycota [subclass Discomycetes] with either Cyanobacteria [blue-green algae] or Chlorophyta [green algae]. Occasionally the fungal partner is a basidiomycete or a deuteromycete [imperfect fungus]. They are classified according to the nature of the fungus. Although by some mycologists not recognized as a formal taxonomic group, also because the affinities of many lichens are still unknown, the [sub] phylum Lichenes is maintained for convenience.

Lichens

- CLASS: Ascolichenes.

- ORDER: Lecanorales [contains the majority of lichens].

  - FAMILY: Cladoniaceae.
    - GENUS: Cladonia.
      - SPECIES: *Cladonia pyxidata.*
        Cladonia rangiferina

  - FAMILY: Parmeliaceae.
    - GENUS: Cetraria.
      - SPECIES: *Cetraria islandica.*
        - GENUS: Usnea.
      - SPECIES: *Usnea barbata.*

- ORDER: Peltigerales

  - FAMILY: Lobariaceae.
    - GENUS: Lobaria.
      - SPECIES: *Lobaria pulmonaria* [hom.: Sticta].

- CLASS: Basidiolochenes.
- CLASS: Lichenes Imperfecti.

(onomy

PHYLUM ZYGOMYCOTA

[Characterized by the formation of sexual, thick-walled zygospores and asexual, nonswimming sporangiospores. Most members of the class Trichomycetes are parasites or commensals inside the guts of living arthropods. The Zygomycetes form a diverse group, some of them being common and fast growing, primary colonizers of carbon-containing substrates. Black bread mould, Rhizopus nigricans, is a well-known representative of the Zygomycetes in the order Mucorales.

The order Entomophthorales contains species pathogenic for humans, causing zygomycosis, as well as species that parasitize and kill various insects. The species *Entomophthora muscae* infects the common housefly. Its mycelium grows within the host's body, so that infected flies are often found attached to windows in late summer or fall, their body surrounded by a halo of whitish spores.]

- CLASS: Trichomycetes.
- CLASS: Zygomycetes.
- ORDER: Entomophthorales.
    - FAMILY: Entomophthoraceae.
        - GENUS: Entomophthora.
            - SPECIES: *Entomophthora muscae.*
- ORDER: Mucorales.
    - FAMILY: Mucoraceae.
        - GENUS: Mucor.
            - SPECIES: *Mucor mucedo.*
        - GENUS: Rhizopus.
            - SPECIES: *Rhizopus nigricans [= Rhizopus stolonifer].*

PHYLUM CHYTRIDIOMYCOTA

[Predominantly saprobic aquatic fungi, although many exist as parasites of other fungi, algae, aquatic animals, or terrestrial plants. Some saprobic

species degrade resistant substances, such as chitin and keratin. The phylum has four orders: Blastocladiales, Chytridiales, Harpochytridiales, and Monoblepharidales. There are no representatives of these groups in homeopathy.]

FUNGAL TAXONOMY

Fossil fungi date from 450 million to 500 million years ago. Their ancestry is not well understood. The two main classes - ascomycotes and basidiomy- cotes - are closely related to each other and probably descended from a common ancestor.

Fungi have been traditionally classified in the plant kingdom. Herbalists and botanists stuck closely to classical authority in the explanations given about the origin of these "bastard plants," taking no notice of suggestions that fungi are not plants. As early as 1583 the Italian botanist Andreas Caesalpini [1519-1603] concluded that fungi are "a sort of intermediate existence between plant and inanimate nature" and "in this respect resemble zoophytes, which are intermediate between plants and animals."

The question temporarily occupied the mind of Linnaeus [1707-1778], father of modern taxonomy, who thought fungi might form a new natural kingdom between those of plants and animals. But Linnaeus wasnt particularly interested in working out the details. He actually disliked fungi, which, in his opinion, "have no soul." The systematist in him, however, produced a competent treatment of fungi in *Flora Suecica* [Flora of Sweden] and found it "a scandal of art" that "the order of Fungi is still Chaos."

Personal distaste conflicting with professional vocation might have been the reason why Linnaeus supported the odd conceptions of the German Otto von Miinchhausen [1716-1774], chancellor of Gottingen University, whose notions were in no way less extravagant than the adventures of his fictional heroic namesake Baron von Miinchhausen.

Otto claimed that spores of Ustilago [smut fungus], if placed in water, develop into insect eggs. Spores of toadstools furthermore proved to be the eggs of small animals and fungal fruiting bodies were not plants but dwellings and edifices of innumerable minute creatures. In the twelfth edition of his *Systema Naturae* Linnaeus, consequently, added the new genus *Chaos* to the

subkingdom Vermes [Worms], which included *Chaos Fungorum* and *Chaos Ustilago.* In the early 19th century the Swede Elias Fries [1794-1878] and the South African Hendrick Persoon [1755-1837] brought order in Chaos, the shapeless and unformed world of fungal taxonomy.

Their pioneering work still stands as the foundations for all that has followed in the field of mycology. Thousands of species described by Fries or Persoon still have the name they gave them, denoted by Fr. or Pers., respectively.

BIOLOGY OF FUNGI

Fungi are more distinct from vascular plants than they are from animals. Considering that *chitin* is the main component of both fungal cell walls and the exoskeletons of insects, arachnids [spiders, scorpions, mites, etc.] and crustaceans, fungi are clearly more closely related to animals than to plants. Yet, the fact that they differ from animals *and* p lants in their characteristics, such as life cycle, mode of nutrition, pattern of development, etc., has been a strong argument for a classification on their own right.

Differences with plants

I. The archetypical body of the flowering plant consists of root, stem, leaves and flowers. The bodies of fungi are variously shaped; roots, leaves and flowers are lacking.

II. Plants reproduce by seeds; fungi by spores.

III. Chlorophyll is present in plants and absent in fungi.

IV. Plants are autotrophic [self-feeding]: they obtain the starchy and other organic foods on which they live by building them up from atmospheric carbon dioxide and the mineral salts of the soil. Fungi are heterotrophic: they depend on green plants for carbon and absorb nutrients already elaborated by other organisms, either directly or indirectly. "This somewhat immoral habit, of living on the energies of their neighbours, renders it unnecessary for them to perform many of the duties of the flowering plants, and this has caused their evolution to develop on simpler lines." [Rolfe & Rolfe]

V. Light is essential for the development of plants. Light is not essential for fungi during the vegetative stage, but in many fungi it plays an important

role during the reproductive stage [production of fruiting bodies and/or spore dispersal].

VI. Plants have two genders; their reproductive organs are male or female. Fungi are more or less genderless, having countless mating types instead.

VII. Plants build up true, specialized tissues, unlike fungi, which have no true tissues.

VIII. Plants are limited in comparison to fungi. “There are hundreds of species of fungi which are ubiquitous throughout the world, at any rate where climatic conditions are suitable, whereas very much more limited habitats are found in the case of many flowering plants which climatically are equally favoured.” [Rolfe]

IX. Plants need one or two seasons to produce seeds; fungi proceed much more rapidly, producing a fruiting body within hours or days.

X. Fungi grow more rapidly in proportion to their body weight than do green plants, and consequently expend relatively more energy in converting their food into an assimilable form. 'Vith moulds an increase in body weight amounting to a thousandfold within a 10-day period, such as occurs in Aspergillus niger, is not uncommon. [Wolf & Wolf]

Expansion and penetration

Fungi develop directly from spores. Spores germinate into thread-like cells known as *hyphae,* rapidly growing slender tubes divided into cells by incomplete cross walls [septa]. In most hyphae, organelles [including nuclei and mitochondria] can more or less freely move around because the septa seldom separate the cells completely. The hyphae of some fungi even have no septa at all. The majority of fungi are composed of hyphae, in contrast to yeasts, which are single-celled. The hyphae form webs or mats known as *mycelium,* which is the feeding, growing form of most fungi. Yeasts do not form mycelia but remain as single cells.

> Often the mycelium is *invisible:* it is buried within the substrate out of which the mushrooms spring. The mycelium is beautifully fitted to its ecological role: it has a great surface area and grows at the tips of the hyphae. Each hypha is a transparent tube, branching and rebranching. In each tube is a rushing torrent of the living contents, the protoplasm, pressing towards the ever expanding tip,” as Brodie puts it. The elements of *penetration* and *extension* are keynotes of fungi. The total hyphal growth of a mycelium [not

the growth of an individual hypha] may exceed 1 km per day! The hyphae have various functions: growth and extension, absorption of nutrients, and anchoring the fungus to its substrate. When sexual spores are produced the mycelium interweaves and mats together its hyphae into elaborate fruiting bodies such as mushrooms. Fruiting bodies spring up from a subterranean web of proliferating threads, the mycelium, that is the *real fungus,* for there are many fungi that do not make their presence known through a fruiting body.

Perhaps the most notorious example of *expansion* is the Honey Mushroom [Armillaria spp.]. Its mycelium spreads by stringy blackish brown strands, which may extend up the hosts trunk or infect neighbouring trees by traversing great distances through the soil. Armillaria is claimed to be the biggest of all living organisms. In Michigan, U.S.A., mycelial threads over an area of 128 hectare were found to belong to a single individual, which was an estimated 1,500 years old. And this is a small one!

A single colony of Armillaria ostoyae growing in the forests of the western state of Washington has been found to cover 600 hectares and to have biomass exceeding that of a blue whale. Every Honey Mushroom meets his match one day, for a few years ago Armillaria-strands were discovered to occupy 890 hectares of the Malheur National Forest in eastern Oregon. DNA analysis demonstrated that 60 of the 100 samples taken were genetically identical. Weighing about 150 metric tons and being at least 2,400 years old, this fungus is among the largest, heaviest and oldest living organisms known on our planet.

"The fifth kingdom, that's what fungi are," concludes David Moore. "More like a fifth column if you ask me; they're all around us, but nobody knows about them."

Reproduction

Most fungi reproduce by the spreading of asexual spores [directly formed spores, without any sort of sexual fusion] by wind, water or animals. Unicellular ftingi [yeasts] reproduce by cell division. Another form of asexual reproduction is simple breakage of the mycelium. From time to time, most fungi form a sexual stage, including reproductive structures.

Sexual reproduction in many fungi features an interesting twist. There is

no distinction between female and male structures, or between female and male organisms. Rather, there is a genetically determined distinction between two or more *mating types.* Individuals of the same mating type cannot mate with one another, but they can mate with individuals of another mating type. This distinction prevents self-fertilization. Individuals of different mating types differ genetically from one another but are often visually and behaviourally indistinguishable.

[Purves et al. 1998]

The actual number of genders or mating types in certain species is very large, which makes the number of possible pairwise combinations astounding. The species Schizophyllum commune, Split-Gill, widely used in genetic studies, was found to have some 21,000 kinds of pairings! Each mating type of many of the higher fungi is determined by *two* sets of genes, in contrast to humans, animals and higher plants, in which each gender is defined by a single set of either male or female genes.

In addition, fungal genes can have hundreds of individual variations. In most kinds of plants and animals the mingling of heritable materials derived from both parents takes place soon after two sex cells unite. In mushrooms this happens only after an extensive courtship.

> In the ftingi, the fusing of the two nuclei happens *long after mating.* When two sexually compatible filaments mate, the nuclei remain separated [haploid]. They remain so as the filaments grow, up to the moment when a fully mature mushroom forms its spores. Thus, for most of its life, each filament contains two separate kinds of nuclei.
>
> Why do the cells wait until the last possible minute to combine their nuclei? At first glance, combining nuclei early or late would seem to make little difference: in each case, two sets of chromosomes are carried by the same cell. If the nuclei fuse, however, they form an irreversible union that seals the fate of their [now diploid] genetic material. The dikaryon [cell with two nuclei], on the other hand, by keeping the two nuclei apart, provides another shot at genetic diversity. In the words of a Boston mycologist, Richard Batchelor, the two nuclei live as roommates, capable of further dalliances.
>
> A dikaryotic filament can still fuse with another filament, leading to a new combination of nuclei and to a different arrangement of genes. It seems that fungi wish to leave themselves open to new genetic opportunities

until the last minute. If we applied the terms of human behaviour to mushrooms, we would conclude that the fungi "commitment" is highly tentative.

[Schaechter 1997]

Fungi seem often highly opportunistic, keeping their options open to the last minute. [See also Flexibility.]

Spores

Fungal spores are microscopically small. They consist of only a single cell and carry only a minute food reserve to sustain the young individual that will emerge from them. Unlike plants, who need to attract pollinators for fertilization, fungi produce spores that are fertile in themselves. The function of fungal fruiting bodies is solely one of dispersa

> Fungi cannot walk or run, but some can swim, most can soar, a few can jump, and some must be carried. ... One of the main reasons for the success of the fungi is their ability to produce and disperse vast numbers of tiny, but often highly characteristic and specialized, spores. By sheer fecundity, the fungi make sure that, whenever and wherever a new food substrate becomes available, they will be on hand to exploit it. Most fungi are cosmopolitan - you could find them almost anywhere in the world. The air we breathe sometimes contains more than 10,000 spores per cubic metre. ... Of course, even these huge numbers become greatly attenuated when the spores are dispersed in the vastness of the atmosphere, but the total spore load of the outside air is always significant, and can on occasion be a real threat to health. [Kendrick 2000]

Metabolism

Unlike green plants and algae, fungi are unable to synthesize their energy requirement from sunlight. Quite the reverse, they generally avoid direct sunlight. Fungi cannot assimilate carbon dioxide. Due to the lack of chlorophyll fungi have adopted another, more animal-like strategy: they obtain their nourishment and energy from organic compounds already produced by other organisms [animals and plants].

Fungi prefer carbohydrates and nitrogen as their main sources. Like animals, they store energy in glycogen rather than in starch, which is the usual storage compound in plants. They can readily absorb and metabolize a variety

of soluble carbohydrates, such as glucose, xylose, sucrose, and fructose, but are also characteristically well equipped to process such insoluble carbohydrates as starches, cellulose, hemicellulose and lignin. To be able to do so, food must be taken in dissolved form [in water], which is being prepared by enzymes. [The carbon source must be an *energy-rich* substance previously synthesized by another organism.] In this fungi are similar to insects and spiders. Decomposition products of proteins can be used by most fungi as nitrogen sources. A number of fungi need additional nitrogen and thus grow on dung or parasitize on arthropods. To obtain nitrogen some have even developed ingenious mechanism for trapping microorganisms, such are amoebas, roundworms and rotifers.

A range of elements is required for normal growth. These include macronutrients such as potassium, phosphorus, magnesium, sulphur, and calcium, and micronutrients like iron, copper, manganese, zinc, and molybdenum. Oxygen and hydrogen are absolute requirements; they are supplied in the form of water or are obtained from carbohydrates. Fungi can do without boron, chlorine, fluorine, iodine and silicon, in contrast to plants, for which these elements are essential or physiologically promotive.

The metabolism of fungi can be likened to that of animals, as it is destructive. The end is the total mineralization of the organic substances. In this the various kinds are able to work together in teams, one variety continuing the destructive process where the other leaves off. Only when understood as a unit can these complicated chain systems show their true functions which, taken all together, constitute the metabolism of the fungi.

The green, assimilating plant raises dead, mineral substances into the realm of life, building up first carbohydrates, then proteins, fats, etc. The digestive activity of the fungi runs in exactly the opposite direction; it leads substances back - step-by-step - into the mineral state.

From its darkness the Earth flowers and fruits through its fungi. The processes that normally terminate vegetative plant growth in the light, i.e. flowering and fruiting, have here sunk down into the soil and become independent. The process takes place at a different level. These fungi sometimes look like shapes born of a nightmare or coming from an underworld. Some seem harmless enough, others have frighteningly glaring colours. There is any amount of variety. Enticement and destruction seem

> to be embodied in them side by side, and they exert a strange fascination. Fungi can do nothing but grow and digest. They can make neither leaves nor stalks nor roots "because the sun does not bother with them."
> Many things point towards the fact that in fungi only earthly influences work, but not the cosmic light forces. Instead of the ethereal scent of a flower we can smell anything from spicy meat to a repulsive stench. Instead of bees and butterflies, we see flies, beetles and slugs feeding on the slimy substances of fungi and the decomposing by-products.
> [Grohmann 1974]

Light

Direct sunlight may be avoided and the sun may not bother with them, yet light is a necessary requirement for many fungi to form fruiting bodies or spores. The actual amount of light needed can be very small. In many cases a brief period of illumination during the early stages of development is all that is necessary; once started, the differentiation of the pileus can be completed in the dark. If the total illumination, however, is too small, growth may be retarded, but with larger amounts death may ensue. Not all species of fungi are equally sensitive to sunlight.

Phototropic fungi respond to the stimulus of light, e.g. by aiming their explosive sporangial mechanism at the light. The presence of light holds the promise of space, maximizing the chance that spores can be projected as far as possible from their launch pads.

> Some fungi in culture display daily rhythms of growth, pigment production, or sporulation, which seem to be responses to the alternation of light and darkness. ... Since fungi grow in so many different habitats, and have such varied ecological requirements, it isn't surprising that we can't generalize on the link between light and sporulation. Light may inhibit, it may stimulate, or it may have opposite effects at different points of development. The effects of light have been investigated from two angles: which wavelengths are active [the action spectrum], and how much light is needed [the dosage response]. ... Most phototropic fungi respond best to blue light. Some ascomycetes and conidial fungi respond to UV, but not to visible light.
> [Kendrick 2000]

Growing conditions

Fungi generally require an *acidic* environment [below pH of 7], while bacteria generally grow in basic environments [at or above pH of 7]. Fungi are very susceptible to drying. If weather conditions are favourable, fruiting bodies of fungi can spring from the soil overnight; but as fast as they come they disappear and dissolve again. No firm frame supports them, no hard shell protects them, and there is no kernel or pip within them.
Some ftingi, on the other hand, can tolerate extreme dryness.

> Some conidial fungi [fungi that form their spores from a hyphal tip] and yeasts are the most xerotolerant [xero=dry] organisms known, able to grow at water activities [a_w] as low as 0.70. If we consider that most animals grow only above a_w 0.99, most green plants wilt irreversibly at a_w 0.97, and most bacteria will grow only at a_w 0.95 or higher, this must be recognized as a truly remarkable talent.
> [Kendrick 2000]

Lichens deal in another way with low water levels. They stop their activities and become dormant during long periods of drought, like hibernating animals.

Rapidity

The fruiting bodies of fungi develop with incredible speed. The embryo of higher fungi starts out as a small but compact latticework of filaments that can barely be seen with the naked eye. Yet the shapes of both the cap and stem are there from the very beginning.

Some fungi don't bother with division of cells or building up specialized tissues, but instead pump fluids into the cells to increase their size in one dimension by 10, 20, or 50 times. Others follow the strategy of just making more cells to increase the volume of the tissue. This explains why the development of fruiting bodies seems so abrupt.

Fungal frigidity

Mushrooms are usually regarded as "cold". At the end of the 19^ century the German mycologist Richard Falck examined whether this is a subjective matter or an objective fact. He found that some mushrooms could be up to 9° C warmer than the surrounding air. Botanist Nicholas P. Money revisited

the heating phenomenon one century later and came to the opposite conclusion.

> Mushroom temperatures were taken by inserting thin wire thermocouples between gills and spines, or up inside the tubes of boletes and other fruiting bodies with pores beneath their caps. A group of students became deeply involved in the work, and measured temperatures from the hymenial surfaces of eighteen types of mushroom in the beech-maple woodland surrounding my university campus in Ohio. Contrary to the earlier work, we found that the mushrooms were colder than the air. I couldn't accept this result for the first few days and kept looking for errors in our method. But the thermocouples were very accurate, and we confirmed that mushrooms cooled during periods of spore release. Cooling was most extreme on warm days, when gills chilled as much as 5° C, but it continued even on cold mornings in November. We then studied mushrooms grown in the laboratory and found that cooling was stimulated by the passage of air around the fruiting body. This suggested an evaporative mechanism of cooling - the origin of chill we experience after swimming.
>
> The warming measured by Falck was probably due to the decomposition of mushrooms that he had plucked from the woods and brought into the laboratory. I'd never noticed how cold mushrooms felt before our experiments. Now I can't walk by a fruiting body without touching its cap. Mushrooms often feel very cold. ... Our experiments exposed the forest floor as a thermal mosaic, with mushrooms as its coldest inhabitants. ... The loss of the water-dependent mechanism of spore propulsion enables gasteromycete fungi to colonize much drier habitats than other basid- iomycetes, and many of them are found on sandy soils and even in deserts. For these fungi, water conservation makes more sense than evaporative cooling, and not surprisingly, the temperature of phallic mushrooms, puffballs, and earth-stars is the same as the air that surrounds them.
> [Money 2002]

Constant activity to maintain intimate relationship with environment

Fungi are essential for life on earth. They release, into soil or atmosphere, carbon, oxygen, nitrogen, and phosphorus, elements that otherwise would be forever locked up in undecomposed organic matter. In feeding on dead or decaying matter, fungi reduce complex organic compounds to simpler

building blocks. Thereby, plants and eventually animals can re-use them. Thus, fungi are life-destroyers as well as life-givers. Existing life must die if new life is to flourish. Fungi bring life to forest floor and meadow both by their ability to draw nutrients to the living and by their capacity *to transform the dead.* Fungi are nature's recyclers, the soil's replenishers.

> With their rapid growth and filamentous form, fungi have a relationship to their environment that is very different from any other group of organisms. The surface-to-volume ratio of fungi is very high, which means that they are in as *intimate* a *contact* wi th the environment as are, for example, the bacteria. With a few exceptions, no part of a fungus is more than a few micrometers from its external environment, being separated from it only by a thin cell wall and the plasma membrane.
> With its extensive mycelium, a fungus can have a profound effect on certain aspects of the surroundings, for example, in binding soil particles together. The maintenance of this intimate relationship between fungus and environment requires that all parts of the fungus are metabolically active; the sorts of quiescent layers of tissue, such as wood, that are found in plants are absent in fungi. The enzymes and other substances that are secreted by fungi have an immediate effect on their surroundings and are of great importance for the maintenance of the fungus itself.
> [Raven et al. 1986]

Relationship to immediate environment - settling down

Fungi can be divided into three categories based on their relationship to their substrate [immediate environment]. Saprophytic fungi or *saprobes* live on dead or decaying matter; parasitic fungi or *parasites* absorb nutrients from living organisms; and *mycorrhizal* fungi or *mutualists* live in mutual beneficial symbiosis with other organisms.

Most serious fungus pests, such as wheat rust, ergot, blights, Dutch elm disease, fall into the category of parasites, but relatively few mushrooms [fungi with a fruiting body] are parasitic. Saprophytic fungi subsist on dead or decaying matter [wood, humus, soil, grass, dung, and other debris]. Mutualists form a mutually beneficial relationship with the rootlets of plants, shrubs or trees called mycorrhiza [from *myco,* fungus, and *rhiza,* root].

Many plants, including almost all tree species, depend on a mutually beneficial symbiotic association with fungi for an adequate supply of water and mineral elements. Unassisted, the root hairs of such plants do not absorb enough of these materials to sustain maximum growth. However, the roots become infected with fungi, forming the association called a mycorrhiza.

In ectomycorrhizae, the fungus wraps around the root; in endomycorrhizae, the infection is internal to the root, with no hyphae visible on the root surface. Infected roots characteristically branch extensively and become swollen and club-shaped. The hyphae of the fungi attached to the root increase the surface area for the absorption of water and minerals, and the mass of the mycorrhiza, like a sponge, holds water efficiently in the neighbourhood of the root.

Most families of flowering plants contain some species that form mycorrhizae, as do liverworts, ferns, club mosses, and gymnosperms. Certain plants that live in nitrogen-poor habitats, such as cranberry bushes and orchids, invariably have mycorrhizae. Orchid seeds will not germinate in nature unless they are already infected by the fungus that will form their mycorrhizae. Plants that lack chlorophyll always have mycorrhizae, which are often shared with the roots of green, photosynthetic plants.

The symbiotic fungus-plant association of a mycorrhiza is *important to both partners.* The fungus obtains important organic compounds, such as sugars and amino acids, from the plant. In return, the fungus greatly increases the absorption of water and minerals [especially phosphorus] by the plant. The fungus also provides certain growth hormones, and it protects the plant against attacks by microorganisms.

Plants that have active mycrorrhizae typically are a deeper green and may resist drought and temperature extremes better than plants of the same species that have little mycorrhizal development. The partnership between plant and fungus results in a plant better adapted for life on land.

[Purves et al. 1998]

Mycorrhizal fungi are host-specific. They cannot grow without their host[s] and their host[s] cannot grow without them. Plants deprived of their fungi grow slowly; many die. Trees deprived of their mycorrhizal partners do not compete successfully with those that have their normal complement. Such fungi have proved invaluable in reforestation projects. Attempts to introduce some plant species to new areas failed until a bit of soil from the native area

[containing the fungus necessary to establish mycorrhizae] was provided. They literally help other organisms to settle down, to take root. Providing added resistance to certain diseases, mycorrhizal fungi have *immunostimulant* activities. In addition, many fungi produce substances - auxin, cytokinin, ethylene, gibberellic acid - that act as *plant growth* regulators.

STRENGTH and SURVIVAL

• Chitin is far more resistant to microbial degradation than is the cellulose found in plant cell walls. Its durability allows certain fungi to break through asphalt in tennis courts and to uproot paving stones.

> Mushrooms may be soft, but they have been known to lift stone slabs and force their way through tarmac. Back in the 1860s, a famous mycologist called M.C. Cooke wrote *A Plain and Easy Account of British Fungi* in which he told of "a large kitchen hearthstone which was forced up from its bed by an under-growing fungus and had to be relaid two or three times, until at last it reposed in peace, the old bed having been removed to a depth of six inches and a new foundation laid." Not only 19th-century building standards are prone to fungal attack. ...
>
> Reginald Buller, a Canadian researcher, did some experiments in the 1920s in which he put weights on the top of developing mushrooms to see how much pressure they could exert. He worked out that a single mushroom could apply a pressure of at least two-thirds of an atmosphere, which is about 10 pounds per square inch. It's all a matter of hydraulics. The mushrooms can fill themselves with water and force their way through cracks and crevices.
>
> They are not doing it because of some perverse intention to break up pavement, but because in nature they need to push through soil and plant litter in order to bring their fruit bodies to a position from which they can release their spores to the winds. Evolution has equipped them with the tools that ensure that they will persist for generations.
>
> [Moore 2001]

• Strength is the quality that enables fungi to accomplish their remarkable exploits. It is also the quality that fungi transfer to either trees in reforestation projects, to lichens for surviving the most inhospitable environments, or to

Vikings, Siberian shamans *[see* Agaricus], Chinese athletes *[see* Cordyceps] or people with weakened immune systems *[see* Ganoderma].
Moulds are known for their resilience. In an experiment conducted in 1935, spores of seven moulds were loosely sealed into small quartz tubes fastened to the outside of the gondola of the Explorer II.
On the Explorers return from an ascent to 72,395 feet, five of the moulds had their vitality unimpaired, though subjected for many hours to drying, extreme cold, strong light rays, ozone and low air pressure.

• Herbs or fungi that help the body adapt during times of stress are called *adaptogens* or *tonics.* Tonic properties of herbs [and fungi] are usually associated with a *bitter* taste. Tonics make the body more resilient and strengthen the body's natural defences. Clinical results with Polyporus officinalis [= Fomitopsis officinalis] in cases of "obstinate intermittent fevers" and "those agues which have been aggravated by abuse of quinine" brought Burt [cited by Hale] to a similar conclusion: "The cases that the Polyporus will give us the best satisfaction in are those of long standing, that have been thoroughly saturated with Quinine and all kinds of remedies; where there is more or less disorder of the liver and abdominal viscera, with anaemia; sallow, jaundiced appearance of the skin; the bowels loose or torpid; but does better if the bowels are costive."

• Fungi affect the immune system. Some act as immunostimulants, whereas certain fungal secondary metabolites, such as *cyclosporin,* are used to depress the immune system in order to "give transplanted organs a better chance of being accepted by the body." Considering the strong fungal affinity for the immune system, it will not come as a surprise that fungal diseases [mycoses], e.g. candidiasis, occur predominantly in immunocompromised patients, just like fungal pests [parasites] flourish in immunocompromised ecosystems, that is on crops grown on soils weakened by monocultural demands and excessive employment of pesticides.
Strength requires energy. Fungi are such excessively energetic organisms because they live on *energy-rich* substances [saccharides] previously synthesized by other organisms. Fungi need to be excessively energetic because they

> ... live in a hostile environment amongst decay on the harshest layer of the ecosystem. There, they encounter disease-causing pathogens far more frequently than other life forms. To survive, they must have proactive, healthy immune systems. Some scientists believe that the antipathogenic properties in mushrooms are precisely what make mushrooms valuable to the human immune system.
> [Halpern & Miller 2002]

• The Kuma tribe of New Guinea employ several mushrooms to evoke a state of excitement known as "mushroom madness." The men get "very excited and combative, to the point of threateningly brandishing their weapons and even lightly wounding others." The women use other "weapons": they become "flirtatious and provocative, boasting of sexual exploits with members of their husbands' clans." Limitless in energy, both men and women are affected, *[see* Boletus]

• The Okanagan-Colville Indians of British Columbia and Washington were known to bathe their babies in a broth of mushrooms with the idea that like mushrooms, which are so strong they move rocks as they grow out of the soil, babies subjected to the broth would grow up strong enough to move men [Hobbs 1995].

FLEXIBILITY

Strength and constant activity to maintain an intimate relationship with the environment have made fungi in terms of evolution into a very successful group of organisms. Adaptability and flexibility have strongly contributed to this success. Through time fungi have kept their options open by avoiding irreversible specialization.

> A key feature during the embryology of even lower animals is the movement of cells and cell populations, so cell migration [and everything that controls it] plays a central role in animal development. Being encased in walls, plants cells have little scope for movement, and their changes in shape and form are achieved by regulating the orientation and position of the wall that forms when a plant divides. Fungi are also encased in walls, but their basic structural unit is a tubular, thread-like cell called a hypha.

The hypha has two peculiarities that result in fungal development being totally different from that in plants: it grows only at its tip and new walls form only at right angles to the growth axis of the hypha. ...

Highly flexible developmental processes allow fungi to adapt to a wider range of conditions. The criterion for successful adaptation is successful production of spores, and even the most monstrously abnormal mushroom can do that. This is not true for animals and plants, where even mild abnormalities can reduce their ability to reproduce quite drastically. Fungi differ from animals and plants, therefore, by having much less selection pressure against developmental abnormality.

Development of a structure like a mushroom fruit body, flowering plant, or furry little animal involves individual cells undergoing different sorts of specialization to carry out different functions in the final structure. Generally speaking, this sort of cell differentiation involves successive steps that steadily reduce the options the cell can follow. Eventually, the cell has only one option: it is fully specialized for a particular function.

Early in this differentiation pathway, the cell retains the ability to revert back to the unspecialized 'embryonic' state, but as it progresses through its differentiation pathway, it becomes committed to that pathway and can turn back no more, which is another respect in which fungi differ from animals and plants. The only committed cells we've been able to find in mushrooms are those that make spores. All other cells, no matter how differentiated they become to particular functions, are able to revert to the simple original state if they are removed from the fruit body and put onto some nutritive artificial medium.

This is another evolutionary adaptation that permits flexibility. It allows the fungus to start over again if conditions really turn so nasty that continued development of the fruit body is not feasible. But this feeble grasp on their specialization also tells us something else unexpected about fungal developmental biology.

Because undisturbed cells in the fruit body do not revert to hyphal growth, their differentiated state is somehow continually reinforced while they are inside the fruit body. Rather than rigidly following a described sequence of steps, developmental pathways in fungi allow application of rules that allow great variability in expression. A sort of fuzzy logic in which decisions between possible pathways are made with a degree of uncertainty, being based on balancing probabilities rather than all-or-none switches. Fungal cell differentiation is no less sophisticated or complex than is found

> in animals and plant, but it is very different. Fungi can vary the timing, extent, and mode of differentiation in response to external signals. They can swap growth forms and procreative phases of their life cycle. It all contributes to making them supremely able to adapt to challenging conditions. [Moore 2001]

In resilient communities such as forests, capable of changing through time in response to changing conditions, fungi are the instruments of much of this dynamism. When environmental change is too extreme or too rapid, not in the last place from disruptions to the forest environment by human activity, the fungal response can damage, even destroy the forest. Ultimately bringing the fungus and tree populations back to a balanced condition in disrupted communities, disease epidemics do not occur in communities where fungi and their host trees have adapted to each other and their environment.

KEYNOTE: *Supreme ability to adapt to challenging conditions and to restore balance.*

COLONIZERS

Lichens manage to survive in the most extreme environments, often on bare rock. They grow in the driest deserts and the coldest, windiest mountaintops throughout the world, places that are inaccessible to other organisms. Such organisms are termed *colonizers* or *pioneers·,* they represent the first step in developing a biotic environment where there was only an abiotic one. Lichens still fulfil this role, while:

> Without the plant-fungus partnership, the very colonization of the land by higher plants and animals, 450 to 500 million years ago, probably could not have been accomplished. The barren, rain-lashed soil of that time was not hospitable to organisms more complex than bacteria, simple algae, and mosses. The earliest vascular plants were leafless, seedless forms that superficially resembled modern-day horsetails and quillworts. By allying themselves with fungi, they took hold of the land.
> [Wilson 1992]

Colonizing and exploring is what fungi do for their business. Hyphal growth allows the fungus to colonize a food source as well as to grow from one food source to another. Depending on the substrate and the nature of the fungus - mycorrhizal or parasitic - these characteristics are either a blessing or a curse. As the natural equivalent of "networking" and "connecting people" [the slogan of a telephone manufacturer], mycorrhizal fungi are so abundantly present in lush lowland forest soil that they connect the trees together, so that trees and their seedlings can exchange food and messages. On the other hand, the fungal urge to explore grows *invasive* and *rampant* when the substrate involves structures that are designed to last, e.g. houses. Some fungi can degrade almost everything we make, with the Serpula lacrymans, the dry rot fungus, as a nightmarish example.

> Groups of hyphae [of Serpula] join together along their lengths to form strands. Some of these can reach a thickness of 5 millimetres or more. The strands are invasive, and the cells of which they are made cooperate to grow away from the food source that is already infected to find other food sources. ... In a real sense, the strands are explorers, and if wood is reached in a strand's wandering, it is immediately attacked and eventually destroyed.
> The strands are what make Serpula so dangerous. Strands can penetrate through the pores in bricks, cement, and stones, under tiles and other flooring, over plaster and other ceilings, and across anything that provides mechanical support. In the laboratory, strands have been grown across a full meter of totally dry plasterboard, and they can do this as long as the originally infected wood continues to provide nutrition to the explorer. [Moore 2001]

Fungi ensure survival by producing astronomical numbers of spores. More by hit than by wit, at least a few will land in a place suitable to germinate. To avoid having to embark on a random search for a new substrate, however, some fungi have equipped their spores with special talents to find a host by actively tracing it.
Resistant to desiccation and designed to survive long trips, fungal spores cover distances far in excess of the distances covered by the larger and less portable seeds of the flowering plants.

> Survival of the fittest requires that a species not only out-eat and out-fight its neighbours, but also maintains the ability to spread into new territories. The farther a species travels, the more likely it is to find new sites for growth and development. Nature is not just "red in tooth and claw" - it is filled with wanderlust as well. The mushrooms are a fine example of this strategy.
> [Schaechter 1997]

Wanderlust! Can the tuberculinic nature of fungi be better expressed? [Mcllvaine looks upon the species Lentinus lepideus as "a sort of commercial traveller" because it is "common wherever railroads are."]

FOOD and ALCOHOL

Lower fungi - yeasts and moulds - and their secondary metabolites or enzymes become increasingly important in food processing and the production of pharmaceuticals. The manufacture of bread, beer and wine depends on the activities of the yeast-genus *Saccharomyces.*

Soft-ripened cheeses and blue cheeses are produced by fungi. The former kinds include Camembert and Brie, both ripened by the moulds *Penicillium camembertii* or *Penicillium caseiolum,* which form a dense white mycelial mat on the surface of the cheese and whose milk-protein-digesting enzymes give the cheese its soft consistency. Blue cheeses - Roquefort, Stilton, Gorgonzola, Danish Blue, Blue Cheshire, Blue Castello - are ripened by *Penicillium roquefortii,* which grows as blue-green veins throughout the cheese, producing its unique pungent flavour and its penetrating odour. Yeasts that grow on the surface of Limburger cheese [Constantine Hering's favourite cheese] provide aroma.

Where for the production of hard cheeses animal enzymes [called rennet], traditionally extracted from the stomach membranes of unweaned ruminants, were used to curdle the proteins in milk, the rapid expansion of the modern cheese-making industry necessitated the development of alternative sources of rennet. And what could better meet such rapid expansion than typically expansive organisms like fungi? Moulds like *Mucor* and *Aspergillus* supply milk protein coagulants to the extent that around 80 percent of cheese making now uses them.

Acidity regulators such as citric acid and fumaric acid, widely used in foods

and soft drinks, are produced on an industrial scale by the moulds *Aspergillus niger* and *Rhizopus nigricans,* respectively. Aspergillus niger is also the active ingredient of "Beano", a product designed to metabolize the galactose in beans or brassicas and so prevent flatulence when eating such foods.

A mould now being produced commercially as a meat substitute is *Fusarium graminearum,* marketed under the name "Quorn", which contains a large amount of protein compared to other fungi - about 12 percent.

In the conversion of cabbage, green olives, and cucumbers into sauerkraut, cured olives, and pickles, the microbial actions of lactic acid bacteria are followed by fermentation by the yeasts *Saccharomyces* and *Torulopsis.*

Fungus-fermented soy foods and condiments - soy sauce, miso, tempeh, ket- jap, and hamanatto - form an essential part of the diet in Asian countries. The Japanese begin their day with a fortifying bowl of miso soup and use this rich, salty condiment to flavour a variety of foods in other meals throughout the day.

To make miso, soybeans and grains such as rice or barley, are combined with salt, a mould culture *[Aspergillus oryzae]* and a yeast *[Saccharomyces rouxii* and then aged in cedar vats for one to three years. Aspergillus oryzae is also involved in the manufacture of hamanatto, soy sauce and its Indonesian variety ketjap, while another mould, *Rhizopus oligosporus,* is employed for the production of tempeh, a kind of soybean cheese.

ALCOHOL and URINE

Fungi and alcohol are closely related. Lower fungi such as yeasts produce alcohol - alcohol and carbon dioxide are by-products of the respiration of yeast - just like quite a number of fungi evoke a state of inebriation [drunkenness, intoxication]. The active components of the fly agaric are excreted unchanged with the urine, so that it has been common practice, at least in Siberia, to drink one's urine after ingesting the mushroom or the urine of another person who had taken the mushroom. The same occurs after ingestion of psilocybian mushrooms, but to a lesser extent; 25% of psilocine is excreted in the urine.

The Soma of the Rig Veda, suggested by Gordon Wasson to have been the fly agaric, in the form of a potion - urine - was offered as a drink, which

would make the imbiber immortal. Rather than with immortality urine is now associated with drunkenness or foolishness. Getting pissed refers to getting extremely drunk and a person who is behaving in a foolish or time-wasting way is said to 'piss about', while a 'piss artist' is someone who drinks heavily or a foolish show-off.

PHARMACEUTICALS

Many fungi cause diseases in humans, animals and plants. But just as many fungi yield products useful to humans. Moulds like *Rhizopus nigricans* and *Curvularia lunata* bring about chemical transformations of compounds, especially steroids such as cortisone, hydrocortisone and prednisone, in a reliable and reproducible way. The mould *Aspergillus terreus* produces a substance called lovastatin that acts as a cholesterol-lowering agent by interfering with enzymes that make cholesterol in mammals. Fungi also produce antitumour agents and immunoregulators. Ergot alkaloids, derived from the parasitic fungus *Claviceps purpurea,* have a variety of applications: migraine headaches, high blood pressure, Parkinson's disease, endocrine disorders, and prevention of postpartum haemorrhage.

The best-known fungal secondary metabolite, no doubt, is penicillin. The first penicillin was extracted from *Penicillium notatum* in the 1940s, after Sir Alexander Fleming had isolated the mould in 1927. It was found that *Penicillium chrysogenum* produced much more penicillin than P. notatum. Even higher-yielding strains were soon selected, resulting in the commercial production of penicillin G, penicillin V and [semisynthetic] beta-lactam antibiotics. In the 1960s, a new kind of beta-lactam antibiotic was isolated from the marine mould *Cephalosporium* and named cephalosporin. During the 1950s the antifungal narrow-spectrum antibiotic griseofulvin, derived from *Penicillium griseofulvum,* came into use to combat dermatophyte infections of skin or nails [tineas]. Treatment needs to be very prolonged and side effects include gastrointestinal disturbances, headache, photosensitivity and allergic reactions [rashes, fever].

NUTRITIONAL VALUE

The nutrient composition of edible mushrooms, wild or commercially cultivated, varies somewhat according to species. Benjamin summarizes the

nutritive value as:

- For overall nutrition, mushrooms fall between the best vegetables and animal protein sources.
- Mushrooms consist largely of water [85-95%].
- The protein content of mushrooms is 15-40% of dry weight.
- All essential amino acids are present in mushrooms.
- Fat-soluble vitamins [A, D, E, K] are present in small quantities.
- Water-soluble vitamins [B-group except B12, biotin; vitamin C] are well represented.
- All the important minerals are present, except iron, which occurs in negligible amounts, except in yeast and some higher fungi. Sodium, potassium, and phosphorus are particularly abundant.
- Carbohydrates are major components, averaging 40-60% of the dry weight.

Hering found that certain tissues need certain condiments. “There remains muscular weakness from all sickness. In such cases a diet of mushrooms will be beneficial. They contain potash and phosphoric acid in a high percentage, which restore muscular tissue. For travellers on foot, rowers, and mountain climbers, they prove a restorative of wasted muscular tissue.”

FUNGOPHOBIA

In the western world, mushrooms and toadstools are inevitably dragged in for describing fear, loathing, total revulsion, and imminent death. Linnaeus saw fungi as “thieving and voracious beggars which seize upon the odds and ends which plants leave behind them when Flora is leading them into their winter quarters.”

“Like snakes, slugs, worms, and spiders, they are regarded as unearthly und unworthy, despicable and inexplicable - the vermin of the vegetable world,” observes David Arora. Mushrooms were closely allied with toads and witches, both regarded as inherently dangerous and evil. It was a common belief in Brittany that the foul materials of the ground engendered both toads and fungi.

Irrational fear of fungi - fungophobia - seems to be particularly common amongst the British. William Delisle Hay, an astute Englishman, expressed

it this way in *British Fungi* [1887]:

> Among this vast family of plants, belonging to one class, yet diverse from one another, comprising more than a thousand distinct species indigenous to the islands, there is but one kind that the Englishman condescend to regard with favour. The rest are lumped together in one sweeping condemnation. They are looked upon as vegetable vermin, only made to be destroyed. No English eye can see their beauties, their office is unknown, their varieties not regarded. They are hardly allowed a place among nature's lawful children, but are considered something abnormal, worthless, and inexplicable.
>
> By precept and example children are taught from earliest infancy to despise, loathe, and avoid all kinds of 'toadstools.' The individual who desires to engage in the study of them must boldly face a good deal of scorn. He is laughed at for his strange taste among the better classes, and is actually regarded as a sort of idiot among the lower orders. No fad or hobby is esteemed so contemptible as that of 'fungus-hunter,' or 'toadstool-eater.' This popular sentiment, which we may coin the word 'fungophobia' to express, is very curious. If it were human - that is, universal - one would be inclined to set it down as an instinct, and to revere it accordingly. But it is not human - it is merely British. It is so deep and intense a prejudice that it amounts to a national superstition. ...
>
> It is a striking instance of the confused popular notions of fungi in England that hardly any species have or ever had colloquial English names. They are all 'toadstools,' and therefore are thought unworthy of baptism. Can anything more fully demonstrate the existence of that deep-rooted prejudice called here 'fungophobia'? ...
>
> [cited by Benjamin, 1995]

Fungi hold a special place of fear in the hearts of the British and to others who trace their descent from the subjects of Richard the Lionheart. These lowly members of the Fungi kingdom were, and still are, in English-speaking countries largely overlooked for any utilitarian purpose. Herbalist John Gerard [1545-1612] expressed the general opinion about "mushrumes or toadstooles" in his major work, the *Her ball or General Historic of Plantes* [1597], by stating that:

> They that be not deadly have a gross slimy moisture that is disobedient to nature and digestion and be perilous and dreadful to eat and therefore it

is good to eschew them.

To criticise people who "hunger after the earth's excrescences called mushrooms" Gerard wrote:

> Galen affirms, that they are all very cold and moist and therefore do approach unto a venomous and murdering faculty, and engender a clammy, pituitous [slimy], and cold nutriment if they be eaten. To conclude, few of them are good to be eaten, and most of them do suffocate and strangle the eater. Therefore I give my advice unto those that love such strange and new fangled [foppish] meats, to beware of licking honey among thorns, lest the sweetness of the one do not countervail the sharpness and pricking of the other.

More than 400 years later fungophobia still can go disguised as dietary advice. Robert Young, for instance, issues the warning to "avoid mushrooms of all kinds, truffles, etc." because "these foods are all acid-forming and contain mycotoxins." The unsubstantiated allegation continues with: "Contrary to popular belief, there is no such thing as a good fungus.

The edible ones are just less poisonous than the ones that kill you immediately!" Eager to prove his point that all fungi cause disease, Young throws in some more absurdities for good measure: "Mushrooms contain varying amounts of *amamtin,* the mycotoxin in all mushrooms. Eaten in small amounts it will kill you slowly. In larger amounts it will kill you almost instantly." With such defective judgement to distinguish the true from the false Young indeed exemplifies the whole idea of fungi.

Fungophobal prose and poetry

Numerous examples of prose and poetry directed against mushrooms are readily found in English literature. The English poet Percy Bysshe Shelley [1792-1822] described in *The Sensitive Plant* [1820] the final dissolution of a beautiful garden due to it being neglected after the death of its lady guardian, using mushrooms images as a metaphor of total disintegration and decay:

> Plants to whose names the verses feel loath
> Filled the place with a monstrous undergrowth,
> Prickly and pulpous and blistering and blue,

And agarics and fungi and mildew and mould
Started like mist from the wet ground cold,
Pale fleshy as if the decaying dead
With a spirit of growth had been animated.

Their moss rotted off them, flake by flake,
Till the thick stalk stuck like a murderer's stake,
Where rags of loose flesh yet tremble on high, Infecting the winds that wander by.

The images of dreadful dreariness, death, decay and dissolution aroused by mushrooms highlight the gloomy-ghostly atmosphere in a passage from *Sir Nigel* [1906], a novel by the British physician and creator of Sherlock Holmes, Sir Arthur Conan Doyle [1859-1930],

> The rain had ceased at last, and a sickly autumn sun shone upon a land that was soaked and sodden with water. Wet and rotten leaves reeked and festered under the foul haze which rose from the woods. The fields were spotted with monstrous fungi of a size and colour never matched before - scarlet and mauve and liver and black. It was as though the sick earth had burst forth into foul pustules; mildew and lichen mottled the walls, and with that filthy crop, Death sprang also from the water-soaked earth.

For D.H. Lawrence [1885-1930], English novelist, poet and essayist, fungi were suitable metaphorical tools to belittle the British bourgeoisie in *How Beastly the Bourgeois Is* [1923].

> 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 bygone life, sucking his life out of the dead leaves of greater life than his own.
>
> And even so, he's stale, he's been here too long, touch him, and you'll find he's all gone inside Just like an old mushroom, all wormy inside, and hollow

under a smooth skin and an upright appearance.
Full of seething, wormy, hollow feelings rather nasty -
How beastly the bourgeois is!

Standing in their thousands, these appearances, in damp England what a pity they can't all be kicked over
like sickening toadstools, and left to melt back, swiftly into the soil of England.

And American poet Emily Dickinson [1830-1886]:

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

Embodiment of bad properties

Animals and plants are commonly used in expressions denoting positive human qualities. Fungi, on the other hand, express implicitly unwanted or undesirable things. The ancient Greeks, for example, referred to their compatriots as being like mushrooms, having noted the similarity between "sphongos" [from which the Latin word 'fungus' is derived] and certain doltish, softheaded people.

When an animal achieves disembodied immortality by becoming a verb, human speakers usually honour its behaviour: we hawk our wares, gull or buffalo our naive competitors, hounds our adversaries, and clam up in the face of adversity; we have also been known to man the barricades and kid around with our companions. But plants and other rooted creatures do not feature so great a range of overt action, and our botanically based verbs therefore tout growth and appearances as sources of metaphor.

Consider the two most prominent examples, citing comparable phenomena but with such different meanings - for one usually expresses our joy and the other our fear. Art and prosperity 'flower'; taxes and urban violence 'mushroom.' The burden of difference reflects an obvious in our culture and legends. We love the bright colours of the 'higher' plants, either radiant in the sunlight or jewel-like in the quiet darkness of the forest. We loathe the

> fire when, on a still day, a lighted match is dropped in dry grass. A fairy ring is usually bordered by vegetation of a more vigorous growth [probably due to growth-stimulating plant hormones produced by the fungus], while that within the area of the ring is often quite rank and stunted. A similar pattern can be detected in "herpes circinatus": the vesicles of ringworm appear in the form of a circle, the centre of which is fading, while on the periphery the vesicles are spreading. "Sometimes, however," states Raue, "there is one larger vesicle, which not infrequently is filled with a bloody fluid, right in the centre of the ring, and around the ring appears still another larger ring." It is a mystery why mushrooms [or vesicles] are seldom seen inside the ring. "At first glance, this may seen obvious," observes Schaechter, "the center areas have either run out of food or have accumulated substances that inhibit the fruiting of mushrooms from the fungal growth in the soil. But some fairy rings are hundreds of years old [and cover many acres of land, as, for example, in the pastures by Englands Stonehenge], which begs the question of why, after so much time, the original state of fecundity has not been re-established inside the circle.

At any rate, the timeless captivation of fairy rings has resulted in a hotchpotch of conjectures, beliefs and superstitions.

> That in England was that the circular growths marked the paths of dancing fairies ... and that they brought good luck to the houses built in fields in which they occurred. French peasants could not be induced to enter the rings because enormous toads with bulging eyes abounded there ... In Germany the bare portion of the ring marked the place where a glowing dragon had rested after his nocturnal wanderings. A very prevalent belief was that such rings marked the presence of treasures which could not be obtained without the aid of the fairies or witches. The earliest scientific explanations were almost as fantastic - thunder, lightning, whirlwinds, ants, moles, haystacks, animal urine and such being considered the causal agents.
>
> [Ramsbottom 1923]

Welsh folktales describe the fate of mortals who enter the ring. He finds within the ring a group of spirits [fairies] and is forced to dance with them. When released and allowed to return home, he finds strange people living there. The disoriented traveller is offered bread. Upon eating it, the passage

of time that he has been away manifests itself in his body and he crumbles to dust. The land of the spirits operates on a different time scale than our world. A moment of fairy time represents an eon of mortal time.

FUNGOPHILIA

Dealing with fungi is for the British a hard nut to crack, whilst the Russians are absolutely nuts about them. Mushrooming is a commonplace tradition in Russia, as well as in other Slavic cultures, and a joyful and pleasurable experience. The forest hunt, or “silent hunt”, provides relaxation and joy for the whole family. No corner of the forest is left unexplored. Boletes, milk caps [Lactarius spp.] and some other species are of special value. They have to be cut, not pulled out of the ground, so that the mycelium remains and others will grow in their place. The real work begins at home, where hours are spent on sorting, washing and drying the precious harvest. They can be dried and used for hot soups in the cold winter. In the villages whole mushrooms are put on threads and hung up to dry in the sun. They can also be marinated or salted to eat with trimming [usually potatoes]. Much appreciated in combination with vodka, mushrooms can be ordered in all restaurants that serve Russian cuisine. Unfortunately, many cases of mushroom poisoning occur. Even good mushrooms become inedible because of the bad ecology. In the region of Chernobyl strange mushrooms, mutants, have appeared, which, allegedly, are very harmful.
Mushrooms play an important role in Russian folk medicine. For centuries people have made tinctures - crumbled fly agaric [Amanita muscaria] steeped in vodka for two weeks - to alleviate joint pains [external use]. Featuring as permanent characters in Russian fairy-tales, edible mushrooms are usually very attractive, kind forest creatures, whilst poisonous mushrooms, such as toadstools and fly agarics, are obligatory attributes of such evil, dark forest-forces as witches and goblins.

MUSHROOMS of IMMORTALITY

Further to the east, the Chinese and Japanese have ancient traditions of eating wild fungi and cultivated species, both for culinary and medicinal purposes. China has the longest tradition, going back some 5000 years. It is impossible to imagine life today in China and Japan without fungi. In contrast to other cultures, where the mushroom stands for anything short-lived - “a one day mushroom” - mushrooms, in particular woody [bracket] fungi, are symbols of longevity in China.
These magical mushrooms, called *chih,* last a very long time when they are dried and therefore were considered to be “herbs of deathlessness.” Should they be eaten, one would immediately attain long life and immortality. A mushroom was one of the attributes of the god of longevity. The Immortals ate them, together with cinnamon, gold and jade. Mushrooms gave the Immortals “bodily lightness.” There were supposed to be 120 kinds of mushroom chih, which ranged in potency, producing a short longevity of 100 years, up to the potent forms that ensured a life of over 1,000 years.

SACRED MUSHROOMS

The use of mushrooms in Mexico for the purpose of divination and healing has deep roots in centuries of native tradition. Archaeological artefacts called “mushroom stones”, excavated from highland Mayan sites in Guatemala and dating from about 500 BC, reveal the existence of a sophisticated mushroom cult at such an early date. Sacred mushrooms were called *teonanacatl* by the Aztecs, which, according to Schaechter, “means ‘dangerous mushroom’ but which has been grandly translated as ‘flesh of the gods’.”

> The Spanish conquerors of Mexico were much disturbed by an important religious cult based on the sacramental consumption of sacred mushrooms. The Indians communed with the spirit world through the mushroom- induced hallucinations. Divination, prophecy, and curing rites likewise depended on the narcotic effects of these fungi. As with other Mexican religions that utilized inebriating plants, European persecution drove the mushroom cult into hiding in the hinterlands. Most of the early chroniclers were clerics who emphasized the need for stamping out such a loathsome custom as the sacramental eating of toxic mushrooms.

> As mycophobes, their religious fanaticism was easily directed towards a despised form of plant life which, through its vision-inducing powers, held the Indian in awe. There was little that Christianity could offer comparable in the Indian mind to the supernatural power of the mushrooms. ...
>
> One of the first European references to teonanacatl mentioned mushrooms "which are harmful and intoxicate like wine" so that those who partake of them "see visions, feel a faintness of heart and are provoked to lust." The natives were reported to eat the mushrooms with honey and "when they begin to be excited by them start dancing, singing, weeping. Some ... see themselves dying in a vision; others see themselves being eaten by a wild beast, others imagine that they were capturing prisoners of war, that they are rich, that they possess many slaves, that they have committed adultery and were having their heads crushed for the offence." ... Despite the great age of the mushroom cult and the numerous detailed and forceful Spanish reports of this curious use of the fungi, our knowledge of their identification, utilization, and chemistry is all recent.
>
> [Schultes & Hofmann 1980]

"As pilgrims seeking the Grail," R. Gordon Wasson and his wife did much to unravel the mysteries surrounding the sacred mushrooms. Their publications on the subject had an unwanted side effect: legions of adventurers, spiritual seekers and sensationalists popped up like mushrooms. "Following my article in *Life,"* wrote Wasson, "a mob of thrill-mongers seeking the 'magic mushroom' descended on Huautla de Jimenez - hippies, self-styled psychiatrists, oddballs, even tour leaders with their docile flocks, many accompanied by their molls. ... Countless thousands elsewhere have taken the mushrooms [or the synthetic pills containing their active agent] and the chatter of some fills the nether reaches of one segment of our 'free press.' I deplore this activity of the riffraff of our population but what else could we have done?"
The search for mind-travel-inducing "Liberty caps" had begun.

INDIA

R. Gordon Wasson championed the notion that hallucinogenic mushrooms were prime factors in the early development of human consciousness. He and his collaborators claimed that the Greek Eleusinian rites were inspired by the drinking of a Claviceps-containing potion; that Mexican religions

were based on the use of sacred mushrooms and that soma, a plant whose juice was used by Vedic Indians in preparing an exhilarating ritual beverage, was actually Amanita muscaria. Although Wassons research is exhaustive and authoritative, other researchers come up with proof to the contrary.

> If Wasson is right, we are dealing with a mushroom that was highly regarded, consumed by Brahmins, and even deified in ancient India. On the other hand, many peoples around the world associate mushrooms with decayed matter and regard them as little different from carrion and other "rotting, decaying, or dying" substances that disgust people and make them seek to keep these substances from entering their bodies. Such views have also been common in India, where Hindus are virtually concerned with pollution brought on by dead and decaying things.
>
> Thus, mushrooms were among the forbidden foods of the Dharma-sutras [composed from about 500 BC to AD 600], which group mushrooms with alliums as deriving from impure substances. They liken mushrooms *Curious* to suc[j disgusting or unlawful foods as excrement of a pig, flesh of *Danger-seeking* humans or carnivorous animals, food touched by crows or dogs, or the *Uninhibited by* leavings of Sudras. They are improper for a twice-born man to eat, and if *conventional* he does so, penance is required and he may even become an outcast. If a *wisdom* person wishes to remain pure when he has eaten banned food unintentionally, he should vomit it up or quickly undergo purification.
>
> Though mushrooms are widely eaten in present-day India, their association with decay remains a concern to persons aspiring to ritual purity. People of one North Indian village have a somewhat different perspective on mushrooms and pollution. They call mushrooms by a word meaning that they grow in places where dogs urinate. Since Brahmins look on dogs as unclean, this contributes to the impurity of mushrooms. Another suggestion is that Brahmins may reject mushrooms because of their odour or because they are cooked like meat and have a flavour like meat.
>
> [Simoons 1998]

CROSSING BRIDGES

Mankind has always had a love-hate relationship with fungi.

A striking example of a fungophobe turning fimgophilic is R. Gordon Wasson. The son of an Episcopalian minister, Wasson made a successful career as an investment banker. In 1926, he married a Russian paediatrician,

Valentina Pavlovna, who brought him into contact with mushrooms. It triggered a lifelong search for references and practices involving mushrooms and of cultures manifesting either a great loathing of mushrooms or else a proclivity to treasure them. The Wassons initiated ethno mycology and are leading authorities on the subject of sacred mushrooms.

Those who do not know the story will be interested in learning how it came about that my late wife, a paediatrician, and I, a banker, took up the study of mushrooms. She was a Great Russian and, like all of her countrymen, learned at her mother's knee a solid body of empirical knowledge about the common species and a love for them that is astonishing to us Americans. Like us, the Russians are fond of nature. But their love for mushrooms is of a different order, a visceral urge, a passion that passes understanding.

The worthless kinds, the poisonous mushrooms - in a way, the Russians are fond even of them. They call these "worthless ones" *paganki,* the "little pagans," and my wife would make of them colorful centrepieces for the dining-room table, against a background of moss and stones and wood picked up in the forest. On the other hand, I, of Anglo-Saxon origin, had known nothing of mushrooms. By inheritance, I ignored them all; I rejected those repugnant fungal growths, manifestations of parasitism and decay. Before my marriage, I had not once fixed my gaze on a mushrooms, not once looked at a mushroom with a discriminating eye. Indeed, each of us, she and I, regarded the other as abnormal, or rather subnormal, in our contrasting responses to mushrooms.

A little thing, some will say, this difference in emotional attitude toward wild mushrooms. Yet my wife and I did not think so, and we devoted a part of our leisure hours for more than thirty years to dissecting it, defining it, and tracing it to its origin. ... Many have observed the difference in attitude toward mushrooms of the European peoples.

Some mycologists in the English-speaking world have inveighed against this universal prejudice of our race, hoping thereby to weaken its grip. What a vain hope! One does not treat a constitutional disorder by applying a band-aid. We ourselves have had no desire to change the Anglo Saxon's attitude toward mushrooms. We view this anthropological quirk with amused detachment, confident that it will long remain unchanged, for future students to examine at their leisure. ...

Mushrooms are widely linked with the fly, the toad, the cock, and the

thunderbolt; and so we studied these to see what associations they conveyed to our remote forebears. ... Since we began to publish, in 1955, people from all walks of life have come to us in increasing numbers to contribute information, and often the contributions of even the lowliest informants have been of the highest value, filling lacunae in our argument. We were amateurs, unencumbered by academic inhibitions, and therefore we felt free to range far and wide, disregarding the frontiers that ordinarily segregate the learned disciplines. What we produced was a pioneering work.

[Wasson 1968]

Whether the deep contact with fungi brought up a fungus-mentality in Wasson, or whether such a mentality resulted in his life-long mushroom quest, is a matter of the hen or the egg. It just proves that the internal corresponds with the external and vice versa.

The fact is that Wasson put some typical aspects of the fungus-mentality aptly into words. Slightly remodelled, we get this: *Unencumbered by inhibitions, we felt free to range far and wide, disregarding the frontiers.* Could fungi speak for themselves, the odds are that they would say the same.

MEDIATORS

Fungi are mediators, effecting a reconciliation of whatever binary opposition they are involved in. As hermaphroditic, they mediate male versus female; as cultivatable organisms, they mediate wilderness versus civilization; as edible poisons, they mediate life versus death.

A widespread belief has it that mushrooms appear where lightning strikes the earth. The thunderbolt of Zeus or Donar is itself a mediation between the celestial realm and earth.

DANGERS of FUNGI

The early classical authors had little system for identifying and classifying plants and animals. The Roman scientist Pliny the Elder [23-79], author of the *Natural History,* te nded to lump together animals and plants in order of size. One of the mysteries with which ancient man had to contend was the

mysterious appearance of fungi that emerged in a matter of hours from nothing more than bare wood, rotting leaves, or a pile of dung.

Such manifestations of nature were difficult to explain, the more since fungi have neither roots nor seeds. For Pliny fungi, particularly truffles [Tuber spp.], were "imperfections of the earth." Two centuries earlier, Nicander [ca. 150-200 BC] had written that the hot central core of the earth generated mushrooms on the surface by rarefying the muds, resulting in excrescences that Nicander regarded as "evil ferments".

An early "classification system" was the division of fungi into edible or poisonous. According to William Emboden, "every Roman and Greek commentator spoke of the danger of fungi, but many of their compatriots ignored their warnings and experimented with this delicacy. A mushroom collector might be appointed to a wealthy family, and his life depended on his ability to procure a variety of edible fungi for the household." Pliny oversimplified matters by stating that all fungi of a livid hue were poisonous and that the best of the edible ones were those that turned red.

That this "system" inevitably led to misidentification is shown by the numerous recorded cases of people who were "strangled" [respiratory failure or asphyxia] by eating mushrooms. Mushroom tasters were just as little a safety warranty, to the detriment of Claudius Caesar [Tiberius Claudius the Emperor], whose untimely demise was reportedly due to a fungal repast prepared for him by his [fourth] wife Agrippina and his stepson Nero. The dish of Claudius's beloved Caesar's mushrooms [Amanita caesarea], liberally laced with Amanita phalloides [Death Cap], had been passed by Claudius's trusted taster, the eunuch Halotus, because the first symptoms of the Death Cap poisoning take eight to 24 hours to develop.

The Death Cap paved the way for Claudius to become a god, for it was reported that he ascended into heaven upon his death. Nero, the co-con- spirator, is known to have remarked when hearing mushrooms at a banquet being described as *the food of the gods,* "Oh, yes indeed, it was fungi that made my father a god!" - a term, curiously enough, that was independently used by Central American Indians at that same time.

In the 16th century it became commonplace to refer to edible fungi as "mushrooms" and to poisonous species as "toadstools", a distinction which, however, has no scientific basis. How such a distinction came about is told

by a tradition current in Poland and adjoining regions.

> When Christ and Peter were passing through a forest after a long journey without food, Peter, who had a loaf in his sack but did not take it out for fear of offending his Master, slipped a piece in his mouth. Christ, who was in front, spoke to him at that moment and Peter spat out so that he could answer. This occurred several times until the loaf was finished. Wherever Peter spat out, edible fungi appeared. The devil who was walking behind saw this and decided to go one better by producing brighter and more highly coloured mushrooms. He spat mouthfuls of bread all over the countryside. The wonderfully coloured mushrooms as well as those which looked very much like St. Peter's mushrooms, were, however, all poisonous.
> [Ramsbottom 1953]

Various common names of fungi still testify to this belief: Deadly Cortinarius [Cortinarius gentilis], Deadly Galerina [Galerina autumnalis], Deadly Parasol [Lepiota josserandii], Dead Man's Fingers [Xylaria polymorpha], Dead Man's Foot [Pisolithus tinctorius], Dead Man's Hand [Scleroderma geaster], Death Angel or Destroying Angel [Amanita ocreata], Death Cap [Amanita phalloides], Devil's Dipstick [Mutinus elegans], Devil's Eggs [Phallus spp.], Devil's Stinkhorn [Phallus rubicundus], Devil's Urn [Urnula craterium], and Satan's Bolete [Boletus satanas].

It was soon found that the colour of mushrooms is far from a reliable telltale sign of danger. Colour is one of the most deceptive and variable features of fungi. The ancients recognized that colour should be used in conjunction with other characteristics, such as the habitat of the fungus. They had noticed that mushrooms growing in association with certain trees were more likely to be edible than those that had other trees as their partner.

> The main problem is one of identification. There is no simple rule or test that will tell whether a mushroom is edible or deadly poisonous. Many people are blissfully unaware of this, and rely on tests, which are irrelevant and fallacious. They are playing Russian roulette. ... Every year, many people take unnecessary chances by eating unfamiliar mushrooms, or confuse poisonous species with edible ones, and every year some unfortunates are fatally poisoned.
> [Kendrick 2000]

ANTIDOTES

Methods have been developed to detect and/or neutralise possible toxins in mushrooms. Purported means of identifying poisonous and non-poisonous types have become part of folklore and widely accepted as fact. A traditional method is to stick a silver spoon into the cooking mushrooms. If the spoon turns black, the mushrooms should be discarded; if not, they can be eaten safely. [Sulphuric compounds may be detected this way since silver turns black when exposed to hydrogen sulphide.] This belief is best forgotten: some deadly fungi will leave the silverware sparkling.

Pliny, like others, recommended cooking mushrooms with pear branches or combining them with meat. A wild pear after the meal would "kill or dull the malice that they may have" if all else failed. Nicander produced a whole range of possible antidotes, including cabbage, rue [Ruta], pyrethrum, soda, cress, mustard, chicken dung, ashes of clematis steeped in vinegar, and "the efflorescence which has accumulated on old corroded copper" [copper carbonate; copper is a general ingredient of fungicides!].
He thought it best to take all these as a mixture and then "putting your right finger in your throat to make you sick, vomit forth the baneful pest." Vinegar and/or salt as neutralising agents are still applied in eastern Europe, where bitter or peppery varieties of mushrooms are prepared by marinating or pickling them in salt, with or without vinegar.

The idea of removing the poisons by extracting the mushrooms in vinegar or water reached its peak in France in the 19th century. Frederic Gerard, an assistant at the Jardin des Plantes, Paris, sent a memoir to the Conseil de Salubrite of Paris in 1851, asserting that he had eaten all kinds of poisonous fungi without any health problems. This claim may have been inspired by Jean Jacques Paulet, who in *Traite des champignons* [1790- 1793] claimed that poisonous fungi became innocuous to animals after being cut into pieces and steeped in water containing salt, vinegar, or alcohol.

In the presence of the commission, Gerard prepared and ate 500 g of *Amanita muscaria* one day and at least 70 g of *Amanita phalloides* on another, showing no ill effects at all. All he had done was to cut up portions of the mushrooms, soak them in vinegared water for a few hours, wash

them, and then boil them for half an hour. [This is no report on how they tasted after this maltreatment.] Suspicion still lurks that he eventually succumbed to mushroom poisoning as a result of his experimental ardour. The French have a penchant for such public displays of bravado.

[Benjamin 1995]

Symptoms such as "Delusion he is a great person" and "Egotism, reciting his exploits," both recorded for Agaricus, nicely illustrate Gerard's "public display of bravado."

Interestingly, the materia medica of both Agaricus [= Amanita muscaria] and Agaricus emeticus [= Russula emetica] contains some references to vinegar. Hering mentions for Agaricus "Smell of vinegar unbearable" and "Vinegar [and Eau de Cologne] induce fainting," while Allen has the opposite: "The patient did not arouse from this state of stupor, except when teased into drinking a mixture of vinegar and water."

Under Agaricus emeticus we find in Allen: "Violent vomiting, with anxious sensation, as if the stomach hung on threads, which would be momentarily torn into, with ice-cold sweat of face, and constantly renewed faintness, even from moving the head on listening to reading; increased by smelling cordials, especially by *vinegar,* which is unbearable. It seems that the symptom "smell of vinegar unbearable" ended up with the wrong Agaricus.

But ultimately and "despite popular belief to the contrary," Ramsbottom is right in arguing that "there is only one practical way of distinguishing between edible and poisonous toadstools. This experimental method is sure, but the result may not profit a man."

NOTHING VENTURED, NOTHING GAINED

People can conveniently be divided into two groups: those who love to venture on eating wild mushrooms and those who not even want to consider it. There doesn't seem to be any middle ground: one is either a "picker" or a "kicker", as David Arora puts it aptly. Although mushrooming is still regarded [in North America] as a bold and unusual avocation, its practitioners are no longer placed in the category reserved for amateur parachutists or daredevil bungee jumpers.

Eating wild mushrooms is like "playing with fire", according to Harvard

microbiologist and devoted mushroomer, Elio Schaechter. He compares it with the Japanese custom of eating fugu, the highly poisonous puffer fish, and considers an old Japanese saying to apply to mushroomers as well: “Those who eat fugu are stupid but those who don’t eat fugu are even more stupid.” Nothing ventured, nothing gained.

> Surely some of the fascination of eating wild mushrooms is that it is like playing with fire. There is a measure of danger, one that even the most experienced mycologists acknowledge, if not always aloud. I believe that my own fears are usually under control, and I don’t fret visibly when eating a reputable species that I have eaten before. My “warning signal” flares when I am confronted with a species new to my palate, however. I imagine all that could happen, but more often than not I end up eating a small amount. Perhaps it is the thrill of the unknown. ...
>
> People often need to joke about the dangers they face. Little wonder that several mushroom clubs call their yearly celebration “The Survivors’ Banquet,” or that certain walks are called “The Optimists’ Foray.” Ditties and mild jokes are often exchanged, especially between experienced mushroomers and beginners.
>
> Most of the humour may not seem particularly funny out of context, but it does reveal something of how people confront danger. Consider the novice’s question: “Can you eat this kind?” Answers the experienced mushroomer: “Yes, of course. You can eat any mushroom once.” Or the ditty: “There are old mushroom hunters and bold mushroom hunters, but there are no old, bold mushroom hunters.”
>
> [Schaechter 1997]

Despite the obvious hazard, dedicated “pickers” seem unable to resist wild mushrooms. Continuing to try new found species, one avid mushroom hunter commented: “I think twice before I eat a wild mushroom - and then I eat it.”

LIKE A CHILD

It takes “a certain boldness and curiosity to seek out mushrooms, and creativity to put them to good use,” an attitude quite the opposite of the fungo-phobic belief that “mushrooms are actively hostile at worst and worthless at best.” [Hence, perhaps, the lingering distrust of western medicine

towards medicinal mushrooms and the inability to perceive them as potentially powerful, despite fungus-derived wonder drugs such as penicillin and cyclosporin, the undiscriminating prescribing of which, unfortunately, has brought up the invasive side of fungi.]

The fungus characteristics of curiosity, energy and resourcefulness are natural characteristics of children. Is it coincidence that certain mushrooms in the Orient are associated with eternal youth?

If unbalanced, these characteristics may result in borderless and uncontrollable behaviour with the impish oddities typical for this group of remedies. Such behaviour is more based on lack of judgement than on intentional mischief. Lack of discernment is what brings mushroom hunters into trouble for it requires keen judgement to distinguish the true from the false, the edibles from the poisonous look-alikes. Judgement of reality may likewise be impaired in the fungus remedies.

The other extreme in people needing a fungus remedy is that judgement, energy and ingenuity are challenged or compromised. This, in turn, invites others to invade their space and privacy, or even to parasitize on them. Opportunists, either germs or humans, are always happy to fill the gaps. The immunostimulating properties of fungi, understood so well by eastern cultures, apply equally to the psychological level of self-defence and putting up one's borders.

The child, symbolizing innocence, spontaneity and lack of aggression, is self-contained and without forethought or afterthought, according to the Chinese. The main threat of the "child" is fragmentation. Twentyman[1] sees a parallel between the realm of fungi and "the system which in the human organisation carries pre-eminently the forces of death - the brain and nervous system."

> The nerve fibres run as threads throughout the organism. The brain and nerves live fundamentally as parasites upon the organism. Only in the embryo do the nerve cells multiply; probably after birth or early childhood they lose the possibility of reproduction. The fungi of course retain this capacity and the hyphae are composed of long chains of cells, unlike the nerve fibres arising from a single cell.
>
> In the embryonic stage of life, and even to a great extent in babyhood, we are almost all head with a small appendage of trunk and limbs. Gradually we grow down from this head, as a plant grows up from the root. It has

> often been noted that plant and man stand in inverted relationship to each other. A man would have to be turned upside down and planted with his head in the earth, trunk, limbs and genitals pointing upwards, for the correspondences between man and plant to become clear.

So if there were a possible relationship to be discovered between brain and nerves and the realm of the fungi, it would point again to the earth as the home of these strange forms of life. In the embryo and baby, the head is still concerned with growth, and consciousness is obviously not yet imprisoned within the witch's cottage of our head. But as the death processes gradually take over in our brains, we wake up in our heads. Historically it was only in Greek times that thinking began to be experienced as related to the brain.

Can we get any further by looking at the drug pictures and medical experiences in relation to fungi? The very nature of fungus activity leading to fragmentation and disintegration, even to atomization, is echoed in the intellectual activity based on the brain. This too in its one-sided analytical and abstracting activity leads to information of ever increasing complexity and chaos, the information explosion.

... The brain and nervous system normally function in adult life in an inhibitory manner. The expression "to keep a cool head" is highly indicative. Bergson at the beginning of this century showed that our senses screen for us, as it were, the multitudinous incoming impressions, so that we become conscious only of a tiny selection, those needed for our action. It would seem then that the fungus represents the brain and nervous system at an earlier, more embryonic stage of development, before it has been overwhelmed by the death or dying processes characteristic of the adult stages. Sense impressions in our drug picture [of Agaricus] are therefore described as more vivid, more full of life, beauty and springtime. When we look back even as far as the Greek civilization we are enchanted by the freshness of their thoughts, which are still full of life and perception. They have not yet been killed off into the abstractions of modern thought life. So under the influence of Agaricus the Lapps and Siberian Shamans find it easier to re-enter states of consciousness of a dreamlike clairvoyance. They become mediums for inspiration by other influences. Wordsworth's *Ode to Immortality* represents a similar idea in respect to childhood.

We may further question whether the movements of uncoordinated character also reflect in some degree the uncoordinated movements of the baby before it has learnt to still the unnecessary, useless movements

and permit only the useful ones to occur.

In agreement with such an interpretation of the *Agaricus* picture would be the use of this remedy in mental retardation where there is a failure of the child to wake up in its mental functions and persistence in a consciousness of babyhood.

1 L.R. Twentyman - The Fungi. The British Homeopathic Journal, Vol. 74. No. 1. January 1985, p. 16-25.

MYCOTOXINS

The classification of mushroom poisoning, designated by the term *mycetismus,* most widely adopted in the beginning of the 20th century was that of Huseman, who recognized three types: mycetismus [gastro] intestinalis, mycetismus choleriformis and mycetismus cerebralis.

In 1923, Ford modified and extended this classification with two more types: mycetismus nervosus and mycetismus sanguinareus. Rather than on organ affinities modern systems focus on the types of toxins [mycotoxins], which are divided into eight groups. The following is a blend of old and new.

- *Mycetismus gastrointestinalis - Gastrointestinal irritants.*

Rapid onset of mainly gastrointestinal symptoms [nausea, vomiting, diarrhoea], which vary greatly in severity but terminate rapidly and usually spontaneously. Health restored in a couple of days; fatalities very rare.

Typical representatives: Russula emetica [Agaricus emeticus in homeopathy]; Boletus luridus and Boletus satanas [blueing Boletus spp.]; Amanita brun- nescens; Lactarius spp.

- *Mycetismus choleriformis - Amatoxins and Phallotoxins.*

Delayed onset, 6 to 24 hours after ingestion, most commonly about 12 hours. Gastrointestinal disturbances prominent at first: violent abdominal cramps, vomiting and purging, lasting 1-2 days and followed by an asymptomatic interlude. During the latency period [6-24 hours] and the brief, misleading remission of symptoms the toxins attack and destroy the cells of liver, kidney and intestine. Loss of strength and weight is rapid, accompanied by pain, nephritis, anuria, delirium and coma. Death, in two to five days,

occurs in nearly 50 per cent of cases.
Typical representatives: Amanita spp. [A. phalloides, A. verna, A. virosa, A. ocreata]; Galerina spp. [G. autumnalis, G. marginata, G. venenata]; Lepiota spp. [L. castanea, L. helveola, L. josserandii]; Conocybe filaris.

- *Mycetismus nervosus - Muscarine.*

Violent gastrointestinal onset, 30 minutes - 2 hours after ingestion, accompanied by "PSL-syndrome" [stimulation of exocrine glands, resulting in profuse perspiration, salivation and lachrymation], contracted pupils, blurred vision, convulsive movements of muscles, slow heartbeat, decreased blood pressure, difficulty in breathing, mental confusion, delirium, hallucinations. Recovery normally within 24 hours, but in severe cases, death may result from respiratory failure or in patients with existing cardiovascular disease. The specific antidote is atropine.
Typical representatives: Clitocybe spp. [C. cerussata, C. dealbata, C. rivulosa, C. sudorifica], Inocybe spp. [I. geophylla, I. patouillardi, I. pudica], certain red-spored species of Boletus, and probably Omphalotus illudens.
Muscarine is present in Amanita muscaria but presumably in too insignificant amounts to produce effects.

- *Mycetismus sanguinareus - Gyromitrin.*

Gastrointestinal symptoms appear 2-12 hours after ingestion: bloated feeling, nausea, vomiting, abdominal cramps, and diarrhoea. Jaundice and anaemia develop later. Haemolytic toxin; urine may contain haemoglobin. Levels of bilirubin and liver enzymes rise, blood sugar level falls. Symptoms include headache, faintness, loss of muscular control, and fever. Coma and death may ensue after 2-7 days.
Typical representatives: Gyromitra spp. [G. esculenta, G. brunnea, G. car- oliniana, G. fastigiata, G. infula]; possibly Helvella spp. [H. eleastica, H. lacunosa] and Paxina spp.

- *Mycetismus cerebralis - Ibotenic acid! Muscimol*

Symptoms normally appear 30 minutes to 2 hours after ingestion, consisting of nausea and vomiting [depending on number of mushrooms used], dizziness, dilatation of pupils, visual distortions, muscle spasms, loss of muscular coordination, followed by "peculiar cerebral symptoms" [exhilaration,

laughing, loquacity, altered perceptions, feeling of greater strength, etc.], or deep sleep full of fantastic dreams. Drowsiness is a common phenomenon. Convulsions may occur.
Typical representatives: Amanita spp. [A. muscaria, A. gemmata, A. pantherina] .
Panaeolus campanulatus is thought to contain both chemicals.

• *Orellanine syndrome.*
Extremely delayed onset of symptoms - up to three weeks. Nephrotoxic; death in severe cases, from kidney failure.
Typical representatives: Cortinarius spp. [C. orellanus, C. gentilis, C. rainierensis].

• *Caprine syndrome.*
Symptoms occur at any time for up to 5 days after consumption of Coprinus atramentarius when an alcoholic beverage is taken. The alcohol reacts with a compound [coprine] contained in the mushroom, mimicking the effects of anti-alcohol prescription drugs such as Antabuse. Symptoms appear 30-60 minutes after the alcohol intake: reddening of ears and nose, hot flushes of face and neck, metallic taste in the mouth, palpitations, tingling sensations, throbbing headache, nausea and vomiting.
Symptoms persist as long as there is alcohol in the system, usually 2-4 hours. Typical representatives: Coprinus atramentarius and Clitocybe clavipes.

• *Hallucinogenic syndrome* [psilocybin - psilocin].
Symptoms similar to those of LSD, arising shortly after ingestion and remaining for several hours. Psilocybin, a compound containing phosphate, is converted by the human body [by removing the phosphate] into the psy- chotropically 10 times more active psilocin. These mushrooms are known as “magic mushrooms” and belong to four agaric genera [agaric = having stem, cap and gills].
Typical representatives: Psilocybe spp. [P. baeocystis, P. caerulescens, P. cubensis, P. cyanescens, P. mexicana, P. semilanceata, P. silvatica, etc.]; Panaeolus spp. [P. cyanescens; P. foenisecii, P. subbalteatus]; Conocybe cyanopus; Gymnopilus spectabilis.

FUNGAL INFECTIONS

Fungal infections [mycoses] can be divided into three categories, which Kendrick describes as follows:

- *Cutaneous infections,* which involve the outer layer of the skin and cause an allergic or inflammatory response.
- *Subcutaneous infections,* usually involving fungi of low inherent virulence which have been introduced to the tissues through a wound of some kind, and which remain localized or spread only by direct mycelial growth.
- *Systemic infections,* which are caused either by true pathogenic fungi which can establish themselves in normal hosts, or by opportunistic saprobic fungi which could not infect a healthy host, but can attack individuals whose immune system is not working. Both kinds of fungi sometimes become widely disseminated through the body of the host.

The first category consists of mycoses caused by about 40 species of specialized keratinolytic fungi [fungi that have the capacity to utilize the highly insoluble keratin]. Known as *dermatophytes* these fungi are placed in three genera: Epidermophyton, Microsporum, and Trichophyton. They cause what is commonly known as *tinea* or *ringworm.*

The second category includes *chromoblastomycosis* [verrucous dermatitis, occurring in barefoot tropical peoples, producing stalked, dull red or greyish warty growths on feet or legs], *entomophthoromycosis* [formation of steadily growing subcutaneous tumour which may involve a whole limb, the chest or shoulder], *maduramycosis* [disease of the feet, occurring in barefoot tropical peoples and characterized by chronicity, tumefaction, and multiple sinus formation] and *sporotrichosis* [nodular, ulcerous lesions of hand and arm, caused by the cosmopolitan plant saprophyte Sporothrix schenckii found on rosebushes, barberry bushes, sphagnum moss, and other mulches].

The third category involves systemic mycoses caused by specialized pathogenic fungi - histoplasmosis [Darling's disease], coccidioidomycosis [Valley Fever], paracoccidioidomycosis [South American blastomycosis], blastomycosis [Gilchrist's Disease]- or by opportunistic saprobes which all rely on

some breakdown in the mechanisms of resistance - candidiasis, zygomycosis, cryptococcosis, aspergillosis, phaeohyphomycosis.

General Diagnostic Principles

I. — Many of the causative fungi are opportunists and are not usually pathogenic unless they enter a compromised host. Opportunistic fungal infections are particularly likely to occur and should be anticipated in patients after ionizing [x-] radiation and during therapy with corticosteroids, immunosuppressants, or antimetabolites; such infections also tend to occur in patients with AIDS, azotemia, diabetes mellitus, bronchiectasis, emphysema, TB, Hodgkin's disease or other lymphoma, leukemia, or burns.

II. — The major characteristic of virtually every systemic mycosis is its chronic course. Septicaemia or acute pneumonia is rare. Lung lesions develop slowly. Months or years may elapse before medical attention is sought or a diagnosis is made.

III. —Symptoms are rarely intense, but fever, chills, night sweats, anorexia, weight loss, malaise, and depression all may be present.

V. — When a fungus disseminates from a primary focus in the lung, the manifestations may be characteristic. For example, cryptococcosis usually appears as meningitis, progressive disseminated histoplasmosis as hepatic disease, and blastomycosis as a skin lesion.

[The Merck Manual, Ió[1]*[1] edition]

ALLERGENIC FUNGI

Allergic pulmonary disorders caused by hypersensitivity to fungi include hypersensitivity pneumonitis and allergic bronchopulmonary aspergillosis.

These diseases arise from a combination of constitutional factors and environmental exposure, in this case to fungal spores.

Spores as allergens

The prime suspect of respiratory allergies provoked by airborne particles were originally the pollen grains of plants, causing what is widely and inaccurately known as 'hay fever'. But people tended to forget that allergenic pollen is actually only a summer problem, while many respiratory allergies persist in fall and winter. So scientists had to look elsewhere for other less

Disease	*Antigen*	*Source of particles*
Farmer's lung	Micropolyspora faeni or Thermoactinomyces vulgaris	Mouldy hay
Air-conditioner	M. faeni, T. vulgaris, etc.	Humidifiers, air conditioners [or humidifier] lung
Bagassosis	T. vulgaris or M. faeni	Bagasse [sugar cane waste]
Mushroom worker's lung	M. faeni or T. vulgaris	Mushroom post spawning compost
Suberosis [cork workers lung]	Mouldy cork dust	Mouldy cork
Malt workers lung	Aspergillus fumigatus, or	Mouldy barley, malt
Sequoiosis	Pullularia pullulans or Graphium spp.	Mouldy sawdust from Redwoods
Cheesewasher's lung	Penicillium spp.	Mouldy cheese

Hypersensitivity pneumonitis

[from: The Merck Manual, 16th edition]

> seasonal causative agents, and found them in the form of fungal spores. ... Many common fungi are now known to be allergenic, and more allergens are being recognized as time goes on. ... Very high concentrations of spores can be encountered during epidemics of fungal plant diseases such as wheat rust, and the spore concentrations to which farm workers handling mouldy hay are exposed can eventually cause a serious and sometimes fatal allergic disease called 'Farmer's lung'.
>
> Here, repeated exposure to high concentrations of spores from a number of different allergenic fungi [often species of *Penicillium* and *Aspergillus}* can lead to sensitization, and produce acute or chronic symptoms. ... Similar complaints have been seen in some office workers when hidden air-conditioning systems have supported massive growth of similar moulds. Bronchial asthma is also frequently provoked by airborne fungal spores, usually belonging to the mould genera *Alternaria, Aspergillus, Cladosporium, Drechslera ['Helminthosporium}* and *Penicillium.* These spores reach their highest numbers in fall, with another lower peak in spring.

Gray gives the percentages of *skin reactions* to various fungi in 261 fungus-sensitive patients. Alternaria tops the list, with skin reactions in 91% of the 261 patients, followed by Drechslera [60%], yeast [56%], smut [54%], ergot [52%], Aspergillus [34%], Penicillium [30%], Trichophyton [29%], Mucor [28%], mushroom [25%], Fusarium [25%], Rhizopus [24%], and puffball [6%].

Clinical features

[from: The Merck Manual]

In *acute disease,* episodes of fever, chills, cough, and dyspnoea occur in a previously sensitized person, typically appearing 4 to 8 hours after re-exposure to the antigen. Anorexia, nausea, and vomiting may also be present. Fine-to- medium inspiratory rales may be heard on auscultation. Wheezing is unusual. With avoidance of the antigen, symptoms usually improve within hours, though complete recovery may take weeks and pulmonary fibrosis may follow repeated episodes. A *sub acute* form may begin insidiously with cough and dyspnoea over a period of days to weeks, with progression requiring urgent

hospitalization. In the *chronic* form, progressive exertional dyspnoea, productive cough, fatigue, and weight loss may occur over months to years. The disease may progress to respiratory failure.

TUBERCULOSIS

The symptoms of fungal diseases, pulmonary or otherwise, bear a close resemblance to those of tuberculosis: fever, chills, night sweats, anorexia, weight loss, malaise. Some mycoses run a similar course to tuberculosis, with dissemination to the same organs. In aspergilloma, for example, the fungus [Aspergillus fumigatus] forms a mycelial ball in a lung cavity produced by an earlier attack of tuberculosis. And with sporotrichosis the infection spreads through the lymphatic system and eventually may become systemic, affecting first the joints, then the bones, and finally the internal organs, through the bloodstream. Interestingly, the bacterium responsible forTB is a *mycobacterium,* literally "fungus-bacterium," due to its myceliumlike growth.
Furthermore, antibodies directed against Mycobacterium bovis [Bacillus Calmette-Guerin, BCG] are highly sensitive in detecting bacteria, mycobacteria and microfungi, whereas spirochetes, viruses and protozoa show no reaction.

> Froio and Bailey write of a case of pulmonary cryptococcosis, which was diagnosed as tuberculosis and lung tumour; Smith reported that cases of coccidioidomycosis have been incorrectly diagnosed as pneumonia, influenza, tuberculosis, measles, smallpox and occasionally even poliomyelitis, typhoid fever, and syphilis. Brasher and Furcolow [1955] state that there are probably a great many cases of histioplasmosis "masquerading" as, or combined with, tuberculosis in various tuberculosis sanatoria. Schneider [1930] suggested that in all likelihood some cases of aspergillosis are undetected as such, since clinical symptoms and X-ray findings are identical with those of chronic pulmonary tuberculosis. He further points out that tuberculin tests are of no diagnostic value, since aspergillosis gives the same local reaction as tuberculosis.
> [Gray 1959]

"The most important use of White Agaric [= Fomitopsis officinalis;

COMMON SYMPTOMS OF THREE FUNGAL REMEDIES

A = Agaricus. B = Boletus. C = Claviceps [Secale].

Mind	
Ailments from sexual excesses.	ABC
Alcoholism.	ABC
Anxiety - about his own health.	AB
Audacity.	AB
Awkward - drops things.	AB
Cheerful.	AB
Company - aversion to	ABC
Company - desire for	AB
Confusion of mind - on waking [in morning]	AB
Delusions - distances are enlarged.	AB
Delusions - objects are enlarged.	AB
Delusions - sees ghosts.	ABC
Fear - of impending disease.	AB
Fear - of insanity.	AB
Fight, wants to.	ABC
Heedless.	AB
Indifference to everything.	ABC
Irritability - in morning on waking.	AB
Irritability - after coition.	AB
Mistakes - in speaking.	ABC
Speech - by jerks.	AB
Speech - slow.	ABC

Vertigo	
With tendency to fall - forward.	ABC
With tendency to fall - backward.	AB
During headache.	ABC
Objects seem to turn in a circle.	AB
Sudden.	ABC

Head	
Congestion.	ABC

Polyporus officinalis in homeopathy] is in the treatment of sweats in wasting conditions such as phthisis," writes Mrs. Grieve. "Its value in checking these profuse sweats has been confirmed by clinical experience." Agaricus muscarius [Amanita muscaria] is of use in "incipient phthisis," according to Boericke, because the remedy "is related to the tubercular diathesis."

The fungal infection *pityriasis versicolor* is "based on a tuberculous diathesis," according to Lilienthal in 'Homeopathic Therapeutics'.

Some Lactarius [Milk Cap] species have been used for treating tuberculosis, a use that is supported because of the strong antibacterial activity present in these mushrooms.

Porcher [1854] commented on several mushrooms for treating tuberculosis. He reported that a French doctor, Dufresnoi, in the early 1800s, cured over 30 cases of tuberculosis using an electuary [a sweet herbal formula] that contained the fungus *Lactarius deliciosus,* conserve of roses, spermaceti, washed sulphur, and syrup of yarrow with a dose the size of a grape during the day. Another French doctor recommended the powder of the mushroom be simply mixed with honey and given in small doses. ...

One of the most widely used of medicinal fungi for tuberculosis was *{Coriolellus suaveolens [= Trametes suaveolens]}*,* a polypore with an anise-scented fruiting body. It was highly recommended by a number of French and German doctors of the time as a cure for this ailment; several cases were reported in Porcher that had been given up as incurable and then completely recovered. Two drams of the powder were given morning and evening to affect a cure.

[Hobbs 1995]

* In homeopathy as Boletus suaveolens.

The therapeutic connection of fungi with lung disease is probably strongest in the lichens, known as the "lungs of the earth." *[see* under Lichens] Evidently, the central themes and issues of fungal remedies will show a likeness with the characteristics of the tubercular miasm!

Enlarged sensation.	ABC
Pain - pressing - Occiput.	ABC

Eye

Staring.	ABC
Lachrymation - during headache.	AB

Nose

Constant inclination to blow the nose.	AB
Epistaxis - morning.	ABC
Obstruction - at night.	ABC
Sneezing - morning.	AB

Mouth

Dryness or Salivation.	ABC
Speech stammering.	ABC

Abdomen

Pain - pressure >.	ABC

Female

Pain, bearing down, Uterus - during menses.	ABC
Pain, labour-like - during menses.	ABC

Chest - heart

Anxiety in region of heart.	ABC
Oppression of chest.	ABC
Pain, pressing, in heart.	ABC
Palpitation - during menses.	AB
Palpitation - from motion.	AB

Extremities

Cramps - calf of leg.	ABC
Numbness - lower limbs - legs.	ABC
Pain - joints - gouty.	ABC
Stiffness - fingers.	ABC

Weakness - upper limbs.	ABC

Generals

Appetite increased/ ravenous	ABC
Appetite wanting.	ABC
Desire for cold drinks.	ABC
Coldness - cold sensation in stomach and abdomen.	ABC
Coldness - hands and feet.	ABC
Coldness - skin.	ABC
Coldness - general chilliness.	AB
Cold <. Winter c.	ABC
Dryness of usually moist internal parts.	AB
After coition <.	AB
Dry food <.	AB
Injuries - dislocation - sprains.	AB
Pain burning [nose; mouth; throat; rectum; urethra; chest; limbs; skin].	AB
Sensation of strength.	AB
Weakness - during menses.	ABC
Weakness - from perspiration.	ABC
Weather - cold, wet <.	ABC
Weather - dry >.	AB

INCENTIVES

What fuels the fascination for fungi? What is so powerfully persuasive about them as to initiate the intrepidity of the true mushroomer? May we expect a similar attitude and philosophy in people needing a fungus-derived remedy? Here are some suggestions.

- It requires the right mentality, which David Arora describes as "a willingness to plunge into the woods, to uncover their secrets, to learn their characteristics, to penetrate their haunts."

- Accordingly, one need "possess sufficient curiosity so that one wishes to understand more than is afforded by cursory inspection," adds Harold J. Brodie.

- "Surely some of the fascination of eating wild mushrooms is that it is like playing with fire. There is a measure of danger, one that even the most experienced mycologists acknowledge, if not always aloud," says Elio Schaechter.

- One must be willing to prepare the way, to be among the first to occupy bared ground. Or as Gordon Wasson put it: "We were amateurs, unencumbered by academic inhibitions, and therefore we felt free to range far and wide, disregarding the frontiers that ordinarily segregate the learned disciplines. What we produced was a pioneering work."

- An attitude of taking nothing for granted is conveyed by Charles Mcllvaine: "I have determined so many of the reputed poisonous species to be edible, that unless positively authenticated, I do not accept repute as truth, but carefully test suspicious species upon myself. When sure there is no danger, I as carefully have them tested by my numerous under-tasters - male and female."

SIGNATURES/ THEMES OF FUNGI

[These are general outlines; accents may differ within groups and signatures *I* themes may overlap. Puffballs (e.g. Bovista) as well as polypores fall into separate groups but both are used as styptics, thus indicating an affinity with haemorrhages. Only a few macroscopic fleshy fungi have a predilection for liver and kidneys, causing failure of these organs, notably Amanita phalloides, Gyromitra, Paxillus, and Cortinarius, and hence display a syphilitic element. Cryptococcus is placed in the dimophic fungi group due to the symptoms it causes, not because of its nature.]

Macroscopic fleshy fungi

[Agaricus; Amanita; Boletus; Bovista; Cantharellus; Chlorophyllum; Coprinus; Cortinarius; Gymnopilus; Gyromitra; Morchella; Paxillus; Psilocybe; Russula; Scleroderma; Stropharia]

- Affinities: CNS. Psyche. Gastrointestinal tract. Liver. Kidneys.
- *Disposition: Tuberculinic.*
- Expansion. Extension. Invasion. Penetration.
- Exploration. Colonization.
- Pioneering. Ability to adapt to challenging conditions.
- Beyond limits. Limitless. Rampant.
- Beyond control. Uncontrollable. Lack/ loss of control.
- Space. Distorted sense of space.
- Opportunistic. Commitment tentative.
- Flexibility. Avoiding irreversible specialization.
- Constant activity to maintain intimate relationship with environment.
- Nothing ventured, nothing gained.
- Invisible.
- Symbiotic or saprophytic [recycling, transformation].
- Help others to settle down.
- Exploitation.
- Carbohydrates. Energy. Alcohol.
- Strength.
- Light - photophobic or phototropic.
- Blue light stimulates. Red light inhibits.
- Moisture/ dampness. Susceptible to drying. Dehydration.
- Rapidity.

- Frigidity.
- Acidity. Vinegar.
- Death. Decay. Dissolution. Disintegration.
- Grotesque. Bizarre. Variable.

Moulds

[Alternaria; Aspergillus; Aureobasidium; Botrytis; Microsporum; Mucor; Penicillium; Rhizopus; Trichophyton]

- Affinities: Respiratory organs. Sinuses. Mucous membranes. Skin.
- *Disposition: Psoric.*
- Isolation. Seclusion/ exclusion. Banishment.
- Expansion. Extension. Invasion. Penetration.
- Hypersensitivity.
- Autumn allergies. Indoor allergies.
- Food allergies.
- Dust.
- Cats and dogs.
- Birds.
- Moisture/ dampness. Susceptible to drying. Dehydration.
- Antibiotics.

Parasitic - endophytic fungi

[Claviceps (Secale); Cordyceps; Fusarium; Neotyphodium (Lolium tern.); Stachybotrys; Ustilago]

- Affinities: CNS. Psyche. Cardiovascular. Hormonal system.
- *Disposition: Sycotic.*
- Dependency.
- Home-bound. Inseparable.
- Expansion. Extension. Invasion. Penetration.
- Endurance.
- Production. Procreation.
- Haemorrhages.
- Hormonal disorders.
- Hyperplasia. Hypertrophy.

- Tremors; shakes & staggers.
- Coolness >; heat <.

Wood-inhabiting fungi

[Armillaria; Auricularia; Ganoderma; Grifola; Inonotus; Lentinula; Nectria; Omphalotus; Piptoporus; Pleurotus; Polyporus; Pycnoporus; Trametes]

- Affinities: Cardiovascular. Gastrointestinal tract. Skin. Immune system.
- *Disposition: Sycotic-syphilitic [cancer-miasm].*
- Abundant; profuse; opulent.
- Inflexible when dry; flexible when moist.
- Tough; unyielding.
- Ferocious; troublesome.
- Hard; rigorous.
- Strangling or strengthening.
- Stimulant. Adaptogen.
- Expansion. Extension. Invasion. Penetration.
- Death. Decay. Dissolution. Disintegration.
- Immortality.
- Luminescence.
- Volume [weight] loss.

Yeasts

[Candida; Kloeckera; Kluyveromyces; Pityrosporum; Saccharomyces; Sporobolomyces]

- Affinities: Assimilation/ metabolism. Mucous membranes. Skin.
- *Disposition: Sycotic.*
- Effervescence.
- Bubbling, belching and burping.
- Expansion. Extension. Invasion. Penetration.
- Wild or domesticated.
- Social alienation.
- Spaciness.
- Mood swings.
- Anger and aggression; explosive or suppressed.

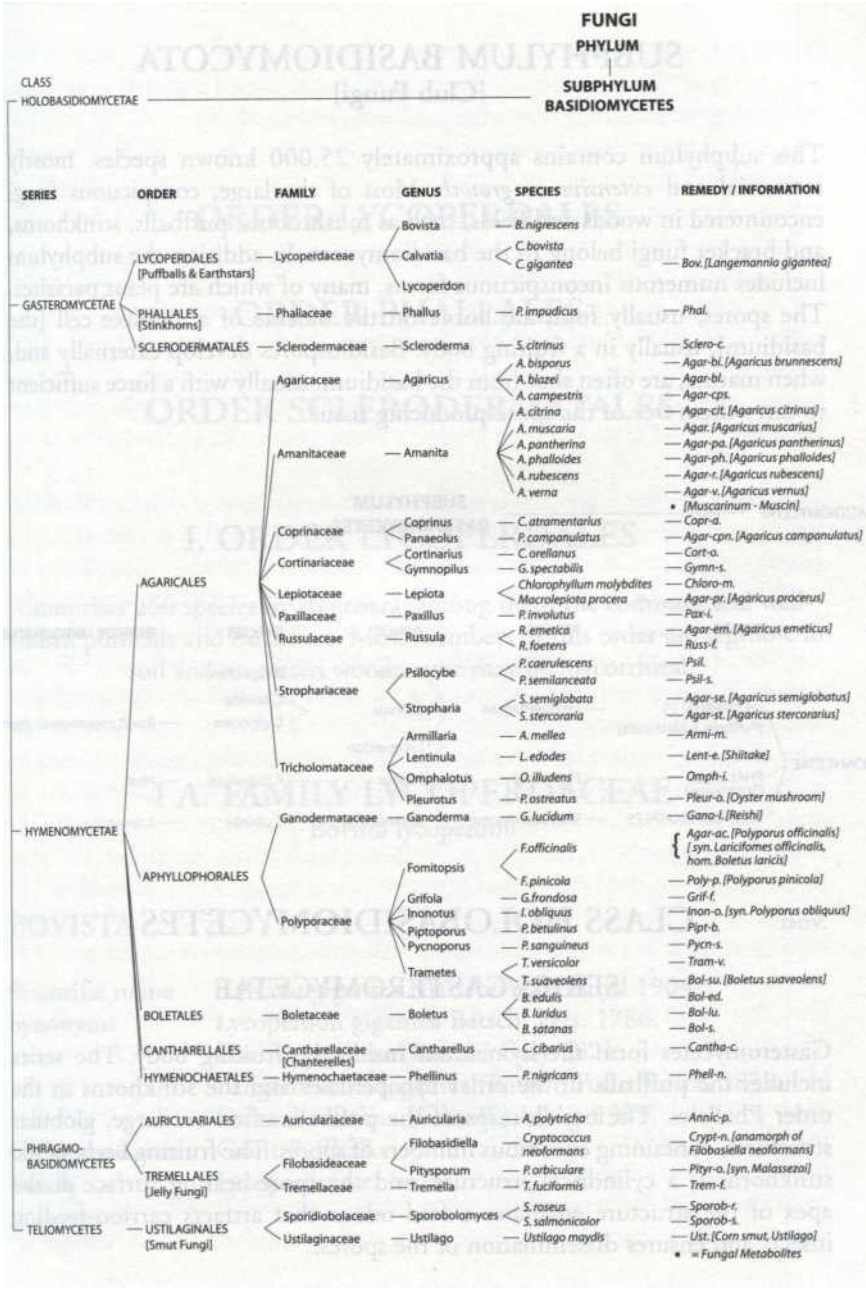
- Carbohydrates. Energy. Alcohol.
- Allergies.

Dimorphic fungi

[Blastomyces; Cryptococcus; Coccidioides; Histoplasma; Hortaea; Paracoccidioides; Sporothrix; Tremella]

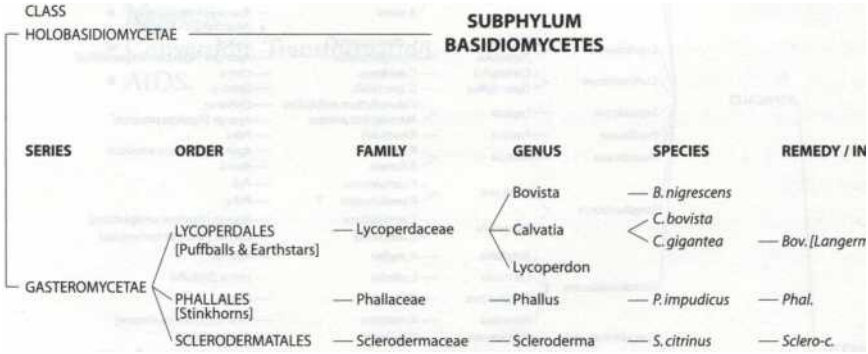
- Affinities: Lungs. Skin and subcutaneous tissue. Immune system. CNS. Musculoskeletal system. Glands.
- *Disposition: Syphilitic.*
- Dissemination. Metastasis.
- Expansion. Extension. Invasion. Penetration.
- Death. Decay. Dissolution. Disintegration.
- Moisture.
- Conversion. Transformation.
- AIDS.

SUBPHYLUM BASIDIOMYCOTA



SUBPHYLUM BASIDIOMYCOTA
[Club Fungi]

This subphylum contains approximately 25,000 known species, mostly terrestrial and *extensive in growth.* Most of the large, conspicuous fungi encountered in woods and fields, such as mushrooms, puffballs, stinkhorns, and bracket fungi belong to the basidiomycota. In addition the subphylum includes numerous inconspicuous forms, many of which are plant parasites. The spores, usually four, are borne on the outside of a clublike cell [the basidium], usually in a fruiting body. Basidiospores develop externally and, when mature, are often shot from the basidium, usually with a force sufficient to carry them free of the spore-producing tissue.



CLASS HOLOBASIDIOMYCETES

SERIES GASTEROMYCETAE

Gasteromycetes form the hymenium inside the fruiting body. The series includes the puffballs in the order Lycoperdales and the stinkhorns in the order Phallales. The basidiocarps of the puffballs often are large, globular structures, containing enormous numbers of spores. The fruiting body of the stinkhorns is a cylindrical structure, and the spore-bearing surface at the apex of the structure emanates a foul odour that attracts carrion-feeding insects and ensures dissemination of the spores.

ORDER LYCOPERDALES

ORDER PHALLALES

ORDER

I. ORDER LYCOPERDALES

Comprises 260 species in 26 genera, among them the common and well-known puffballs and earthstars. Most members of this order are saprobic in soil and on rotten wood; some may be mycorrhizal.

I A. FAMILY LYCOPERDACEAE

BOVISTA **Bov.**

Scientific name	Calvatia gigantea (Batsch:Pers.) Lloyd 1904.
Synonyms	Lycoperdon gigantea Batsch: Pers. 1786. Bovista gigantea (Batsch) Gray 1821. Langermannia gigantea (Batsch: Pers.) Rostk. 1839. Calvatia maxima (Schaeff.) Morg. 1979.
Common name	Giant Puffball.
Family	Lycoperdaceae.

KEYS

- Saprophytic fungus attached to the soil by a cord-like mycelial strand.
- Breakfast mushroom. [Repertory: After breakfast >].
- Styptic; haemorrhages.
- Foretelling the future.
- Bone dry; rich in aluminium.
- Puffiness; enlargement; distension.
- Emptiness; deflation; gone with the wind.
- Rupturing when agitated. [Repertory: Telling the plain truth.]
- Dark clouds of spores, like smoke or fog.
- Double skinned; skin eruptions.

NOMENCLATURE

The name *Bovista nigrescens* as well as the common name 'Warted Puffball' [given by Allen and Clarke] are both incorrect when used as *synonyms* for the species used in homeopathy, 'Lycoperdon bovista'. Ashwell's *Companion to the British and American Homoeopathic Pharmacopoeias* [1890] states that the fungus concerned is "smooth and soft" instead of warted. Ashwell's description of it being "a regular globe" would seem more befitting Bovista nigrescens than Calvatia gigantea since the latter usually forms an irregularly rounded fruiting body.

The addition "with only two coats" is of no help in distinguishing because both Bovista and Calvatia are double skinned. [Incidentally, there are rarely more than "two coats".] If we take into account Hamilton's warning in *The Flora Homoeopathica* [1852] that "care must be taken to gather the true Bovista, and not the Lycoperdon giganteum or proteus, which is much larger and more *tuberculous,"* the Bovista of our materia medica will be *Bovista nigrescens.* This is a small, whitish puffball without stem, rounded, small to medium sized [3 to 8 cm in diameter], and with the outer skin whitish at first, then soon darkening with age ['nigrescens'].

The fungus is so light and small that it easily becomes detached and rolls around scattering its spores. Presence of this feature would have left no doubt about the identity of our Bovista, but neither Ashwell nor Hamilton mentions it. Against the candidature of B. nigrescens is also the fact that references to Lycoperdon bovista in old mycological books are accompanied by the addition "giant puffball". Both Mcllvaine [1902] and Cooke [1893] give the names Lycoperdon giganteum and Lycoperdon bovista Linn, as

synonymous with *Calvatia gigantea.* Moreover, Hamilton gives "Storsvam" as the Danish name for the "true Bovista", which is in contradiction with his warning not to confuse it with the "much larger" Lycoperdon giganteum because that is exactly what "stor", Scandinavian for *large,* refers to.
All things considered, there is enough reason to agree with the German Pharmacopoeia to take **Calvatia gigantea as Bovista.**

FEATURES

- Roundish, sometimes flattened or lobed fruiting body, 8 to 60 or more centimetres in diameter.
- Double skinned; outer layer smooth, white or brownish-stained, sometimes composed of minute spinules or granules; inner layer brown, exposed with age.
- Stemless. [Lycoperdon spp. have a stalk!]
- Attached to the soil by a cord-like mycelial strand.
- Flesh [actually the spore mass] at first white and firm and cheesy, becoming yellowish and smelling like old urine, and finally brown and powdery.
- Spores brown and in massive amounts [up to 7 trillion], discharged in puff-like clouds.
- Solitary, scattered or in large circles in fields, pastures, open woods, cemeteries, under small stands of trees, around forest openings, etc.
- Often reappearing for many years in the same locality.
- Late summer to fall.
- Saprophytic.

PUFFBALLS

Puffballs are amongst the commonest fungi in meadows and pastures. They are known by several popular names, such as fuzzball, bulver, bullfist, puckfist, blindball, Satan or devil's snuffbox.

Gerard, in his *Herbal,* says that the fruiting body "being trodden upon do breathe forth a most thin and fine powder, like unto smoke, very noisome and hurtful unto the eyes, causing a kind of blindness, which is called Poreblind, or Sand-blind." According to him the blindness is permanent: "divers have been pore blind ever after, when some small quantity thereof has been blown into their eyes."

The immense numbers of spores make puffballs, in particular Calvatia's, the most prolific organisms living on our planet.

> An organism so ambitious in its projected progeny might readily be labelled as potentially successful. What if the success materialised? What if the spores all fulfilled their function and produced fruiting bodies? Seven billion of these of average size placed end to end would put a girdle round about the earth more than five times; if their spores were equally successful the resulting fruiting bodies would stretch twice to the sun and back, and form a mass eight hundred times the weight of the globe. We are on safe ground asserting that this does not happen. ...
> ... It is certain that on the average only one fruiting body is formed from the enormous mass of spores, on the assumption that the fungus is an annual. This, however, is not so, for it often grows in rings. Theoretically one spore is capable of giving rise to the ring, and probably for a century numerous fruiting bodies has been formed, each with its billions of spores without hope of posterity. ...
> A fungus spore grows and produces mycelium if it chances to reach a suitable environment; this persists and produces a fruiting body if it is able to withstand the competition it encounters there. It survives because it is able to do so, not because it is best fitted to do so. If spore-production be the criterion of success, *Lycoperdon giganteum* [now Calvatia gigantea] is certainly successful. It appears to be impossible to find any satisfactory explanation for the enormous wastage. Obviously with such a colossal number of spores dispersed far and wide we may assume that some fall on good ground, but we cannot reasonably postulate that the super-abundance is designed to ensure this; it is a possible but not a purposeful result. [Ramsbottom 1953]

Young puffballs, the cut surface of which is white as snow, are edible, having "but few competitors for the place of honour at the table," according to Cooke, but older specimens deteriorate very speedily after gathering and have a bitter taste. Young specimens are considered "much lighter and more digestible than egg omelettes, and resemble brain fritters." Some people refer to puffballs as 'breakfast mushrooms' because they blend so well with eggs.

Puffballs were used to smoke out bees. "In some places of England they use to kill or smoulder their Bees [with puffballs], when they would drive the Hives,

and bereave the poor Bees of their meat, houses, and lives," writes Gerard. Puffballs have scatological associations. Lycoperdon means 'wolf's fart' in Latin, which is in keeping with common names as 'pixie-puff' and 'puckfist', denoting an imp's silent fart. To the Basque people the puffball's is the 'ass's fart'. Among the Maori of New Zealand puffballs are known as 'faeces of ghosts or stars'.

UMBILICAL CORD

Puffballs have the peculiarity of being attached to the soil by a cord-like mycelial strand, reminiscent of an umbilical cord. This might have been a reason why the North American Dakota Indians used the puffball for obstetrical purposes and called it 'baby's navel'.
The words 'navel' and 'mushroom' are linguistically related in many languages, e.g. the Italian word *boleto* for mushroom is related to *bellico,* their word for belly or navel.

> The word used in the Vedas is *nabhi,* also used to describe the hub of a wheel, the axis of the chariot. There are many symbols of the *axis mundi,* among which are the sacrificial fire and the centre of the mandala, representing the tree of life at the centre of the world, the source of life, death, and immortality. The amrita [the immortality-inducing drink of the Hindu gods] is called the "navel of order *[rta],"* the Sanskrit term *rta* signifying the "law" or "way" of the universe, the divine order of things, and the immutable laws handed down from heaven. Soma is the umbilical cord that attached heaven to earth.
>
> Your highest navel is attached in heaven; your fingers grow on the back of earth. *[Rig-Veda* IX.79.4]
>
> I have drunk the navel [i.e., Soma] into the navel [i.e., the stomach] for our sake. Indeed, the eye is altogether with the sun. I have milked the child of the wise. *[Rig-Veda* IX. 10.8]
>
> The sharp seer, in heaven's navel, is magnified in the woollen filter, Soma the wise, possessed of good intelligence. *[Rig-Veda* IX. 12.4]
> [Shelley1995]

Spiritual concentration centres upon the navel, an image of the return to the centre of things. However, in common language navel-gazing refers to worthless, unproductive self-analysis, in particular when direct action is required. A kind of emptiness, unconnectedness and deflation: gone with the wind. Bovista has several symptoms related to vacancy, e.g. “Lost in thought; she looked a long time at one point.” *[see* below under Emptiness, deflation.]

BLEEDING

Puffballs have been much used as a styptic for cuts and a stauncher of nosebleeds. In farmhouses strings of dried puffballs were kept at hand for emergencies. The Romans had a couplet, “Quanda mandi chivs moilee ke vindi morripude” - when a man cuts his finger he uses a puffball. In England the spongy part of a puffball - “as a soft and comfortable surgical dressing” - was put on a cut to stop the bleeding instantly. Large puffballs were in great demand by English country butchers. The puffballs were cut in slices and kept in the slaughterhouse, to be put on cuts to stop bleeding and prevent infection. If the interior of the puffball had turned into powder, the outer skin was used as a plaster. Bad cuts healed completely in less than a week. The Blackfoot Indians drank an infusion of puffball spores to stop internal bleeding, while other tribes used them to soothe burns and itching. The spores used like talcum powder were employed to treat diaper rash and sores.

In Herings Guiding Symptoms, Volume 2, page 497, we find this advice:
In bleeding gums after extraction of tooth, apply pieces of fungus to cavity; two or three applications will cure worst case of haemorrhage; for any other kind of wound, a piece large enough to cover wound, held firmly on, or bandaged on, will arrest flow of blood; in epistaxis, hold a good-sized piece of fungus close to nostrils, and direct patient to inhale with all possible force fumes [= spores] arising from it under pressure of hand.

RUPTURE

Fungi have all their own individual methods of spore dispersal. Some lower the temperature of the hymenial surface, others dissolve the spore-bearing surface, again others attract flies to distribute the spores, and some catapult their spores into open space. Puffballs do it by tearing open or by creating a

slit or mouth at the top of the spore case. The wind may suck spores out of these openings like smoke drawn from a chimney or the spores may puff out of the opening when the fruiting body is *agitated.* The slightest knock or vibration is sufficient, for instance by a drop of rain, a gust of wind, a falling twig, an animal paw, etc. The spores are then projected vertically into the air in the form of brownish clouds.

FUTURE

Puffball is a corruption of *puck* or *poukball,* formerly called *puckfist.* The word *puck* is of Celtic origin, appearing in slightly varying forms as the Irish *puca* and the Welsh *pwca* or *pwci,* all denoting an elf, hobgoblin or demon. “Elves and toadstools are in truth indissolubly linked together, not only in the matter of meadow [fairy] rings, for other tricksy sprites were said to sow the puffballs.” This statement leads Wolfe and Wolfe to introduce Puck, “a fairy and merry wanderer of the night”, a “rough, knurly-limbed, faun-faced, and shock-pated, a very Shetlander among the gossamer-winged” fairies around him. It was Puck who gave his name to the puffball.

The Irish know Puck as the pooka. No fairy is more feared because it is always out and about after nightfall, creating harm and mischief. It is the curse of all late night travellers and has to be continually placated or it will create havoc in the countryside. For this reason a share of the crop, known as the ‘pooka’s share’ is left behind on the field at the end of the harvest. In some areas of Ireland, however, the pooka is rather more mysterious than dangerous, provided it is treated with proper respect.

> The pooka may even be helpful on occasion, issuing prophecies and warnings where appropriate. For example the folklorist Douglas Hyde referred to a ‘plump, sleek, terrible steed’ [the pooka most often appears in the guise of a horse] which emerged from a hill in Leinster and which spoke in a human voice to the people there on the first day of November. It was accustomed to give “intelligent and proper answers to those who consulted it concerning all that would befall them until November the next year. And the people used to leave gifts and presents at the hill.”
>
> ... Only one man has ever managed to ride the pooka and that was Brian Boru, the High King of Ireland. Using a special bridle containing three hairs from the pooka’s tail, Brian managed to control the magic horse and stay on its back until, exhausted, it surrendered to his will. The king then

> extracted two promises from it; firstly, that it would no longer torment Christian people and ruin their property and secondly, that it would never again attack an Irishman [all other nationalities are exempt] except those who are drunk or abroad with an evil intent. The latter it could attack with greater ferocity than before. The pooka agreed to these conditions. However, over the intervening years, it seems to have forgotten its bargain and attacks on property and sober travellers on their way home continue to this day.
> [Bob Curran - A Field Guide to Irish Fairies; Appletree Press, Belfast, 1997.]

It may seem somewhat far-fetched to link a nice piece of puckfist-folklore to the use of puffballs by Mexican Indians as divinatory agents, but there is an element that both have in common and that is foretelling the future. The pooka gives "intelligent and proper answers" to questions concerning the future, whilst the Mixtec Indians of Mexico employed two Lycoperdon species to bring about a state of half-sleep during which voices and echoes were heard. These voices were said to respond to questions posed to them. The course of future events was then deduced from the echo answers. Definite auditory, rather than visionary, hallucinations are reported to characterize the puffball intoxication.

CLINICAL MANIFESTATIONS

In Allen's Encyclopaedia symptoms are included which were observed from inhaling the fumes of the burning fungus. In a botanical work of the midnineteenth century, the Reverend Hugh Macmillan describes the anaesthetic and sleep-inducing properties of puffballs. "The common puffball deprives the patient of speech, motion, and sensibility to pain, while he is still conscious of everything that happens around him. ... When the fumes of the burning fungus are slowly inhaled, they gradually produce all the symptoms of intoxication, followed first by drowsiness, and then by perfect insensibility to pain, terminating, if the inhalation be continued, in vomiting, convulsions, and ultimately in death."
There is evidence that puffballs possess narcotic properties. The North American Flathead Indians rub spores of certain puffball species [probably Lycoperdon] on the eyelids and cheeks of children to induce sleep.

Giant Puffballs are edible but may become slightly poisonous when starting to brown. In one case of eating the raw, brown flesh, and drinking alcohol,

drowsiness and vomiting occurred in 8-10 hours. Another case showed an allergic reaction, with rash, flushing and a burning sensation around the mouth.

Lycoperdonosis

Inhalation of puffball spores is a folk remedy to control nosebleed. Applying a piece of the spongy flesh of the fungus is a safer method, since massive inhalation of the spores may cause a syndrome termed lycoperdonosis. The syndrome is characterized by nasopharyngitis, pneumonitis and dyspnoea mimicking an asthma attack.

Of the eight adolescents who inhaled and chewed puffballs [Lycoperdon perlatum] , in the apparent belief of obtaining mind-altering effects, three suffered from nausea and vomiting within 6-12 hours after exposure. Within 3-7 days after exposure, all patients developed cough, fever [temperature up to 39.4 C], shortness of breath, myalgia, and fatigue. Five persons required hospitalization; two were intubated.

Histopathologic examination of lung biopsy specimens revealed an inflammatory process and the presence of yeast-like structures consistent with Lycoperdon spores.[1]

1 Respiratory Illness Associated with Inhalation of Mushroom Spores; MMWR Weekly, July 29, 1994, 43 [29]; 525-526.

Saprophytic fungus attached to the soil by a cord-like mycelial strand.
Breakfast mushroom.
[Repertory: After breakfast >].
Styptic; haemorrhages.
Foretelling the future.
Bone dry; rich in aluminium.
Puffiness; enlargement; distension.
Emptiness; deflation; gone with the wind.
Rupturing when agitated.
[Repertory: Telling the plain truth.]
Dark clouds of spores, like smoke or fog.
Double skinned; skin eruptions.

THERAPEUTICS

Said to be anodyne and antiseptic, and to be a good application to cancerous growths, to allay pain and check bleeding. Porcher, from personal experience, declared the Giant Puffball to possess some narcotic power. A tincture has been used in nervous affections and the dry powder in intertrigo. The fumes from burning this common puffball are narcotic and anaesthetic, but no practical application of them has been made. In 1853, Dr. B. W. Richardson, acting upon the suggestion that the fumes of this fungus stupefied bees, experimented upon and narcotized and anaesthetized several animals, from one of which he painlessly removed a tumour. If carried too far the inhalation produced death, respiration being paralyzed. No congestion was produced. When death was not produced the animal slowly recovered,

and even after the narcotism had passed off the perception of pain was for a time abolished. These effects have been attributed to carbon dioxide, the gas given off when the puffball is burned.
[King's American Dispensatory]

In traditional Chinese medicine, Calvatia gigantea is said to be effective against chronic tonsillitis, and swollen, sore throats. Pharmacological research in China supports the traditional haemostatic effect of puffball spores. In one study of 467 patients, *Calvatia gigantea* spores were effective in 98% of the cases in stopping traumatic haemorrhage after operations. [Compare the symptom in the homeopathic materia medica: Profuse bleeding of gums after tooth extraction.] In Chinese folk medicine *C. gigantea* as well as *C. lilacina* is recommended for coughs, hoarseness and sore throats.
In German folk medicine Calvatia-spores were used to treat urinary problems, corrosive leucorrhoea, asthma, palpitations, and, particularly in Austria, to induce abortion.

ALUMINIUM

• Puffball spores are bone dry. The ash of Calvatia gigantea is rich in *aluminium.* Very fine aluminium dust is easily ignited and may give rise to explosions. The high aluminium content was utilized in early theatres for creating stage lightning by blowing a mixture of spores from *Lycopodium* and *Calvatia gigantea* through a flame. [Lycopodium also contains high amounts of aluminium!]

• Aluminium powder was previously used in medicine as an astringent, drying agent, and deodorant. As a dressing for wounds and ulcers it has similar effects to puffball spores, which staunch the flow of blood and dry out wounds.

• Bovista and Alumina have nearly 1,000 symptoms in common. The following is a selection of rubrics containing less than 50 remedies in which both remedies are present.

- Audacity.
- Confusion of mind, after rising; from alcohol/ wine.
- Courageous.
- Delusions: enlarged; parts of body seem too large; of water; creeping

of worms.

- Dullness on waking.
- Fear of pins/ pointed things.
- Indiscretion. Reveals secrets.
- Laughing alternating with weeping.
- Mistakes: in speaking [misplacing words]; in time.
- Telling the plain truth.
- Headache > during eating.
- Foggy vision in morning. [Concomitant of confusion and dullness.]
- Viscid, tough nasal discharge.
- Sneezing in morning.
- Face: changing colour.
- Eruptions: around nose; on cheeks [herpes]; on lips [vesicles].
- Dryness/ rawness of throat in morning on waking.
- Appetite increased after eating.
- Emptiness [stomach] after eating.
- Nausea: with chilliness; on motion; with palpitation; before breakfast.
- Constipation during menses.
- Diarrhoea before and/or during menses.
- Leucorrhoea: ropy, stringy; transparent; < walking.
- Hoarseness in morning.
- Respiration difficult from mucus in trachea.
- Dry cough in morning after rising.
- Palpitation of heart: after eating; after excitement; during menses.
- Sensation as if heart is enlarged [swollen],
- Itching sacrum/ coccyx.
- Sleeplessness: from coldness; from itching.
- Dreams: drowning; exhausting; ghosts; snakes; water.
- Sensation as if about to perspire, but no moisture appears.
- Generals: full moon <; wet weather >.

MATERIA MEDICA

Provings

[1] Hartlaub [H] [1828], Nenning [N], Schreter [S] - preparation and method unknown.

[2] Petroz [P] - symptoms from inhaling the fumes of the burning fungus and symptoms observed by a young woman, very sensitive to medicinal action, from

KEY COMPONENTS

Instead of repeating Bovista's materia medica I have arranged the symptoms according to their parallels with the key features of the mushroom, including its universal use as a styptic and its anaesthetic properties.

Key features

= Puffiness.

« Puffing/ discharging.

«« Clouds of spores, like smoke or fog.

The puffball is in Sweden known as *roksvamp,* 'smoke mushroom'.

= Projects spores when agitated [touched, jarred, pressed].

The Dutch name for the puffball, *stuifcwam,* is related to 'opstuiven', to flare up, comparable to the Bovista symptom, "Great irritability, takes everything amiss."

= Tearing open.

"Je scheur opentrekken," is a Dutch slang expression, meaning literally "to tear open one's trap." It refers to someone speaking out frankly and rather rudely. The expression may also be addressed to a person as an invitation to express one's feelings unreservedly.

= Dryness. [Dry spores. Desiccation. Dry habitats.]

The loss of the water-dependent mechanism of spore propulsion enables gasteromycete fungi to colonize much drier habitats than other basidiomycetes, and many of them are found on sandy soils and even in deserts. [Money]

<= Double skinned.

The outer layer of skin of Calvatia is initially smooth [with the texture of kid glove] and cracks up into flat scales when maturing. The scales flake off and expose the paper-thin inner layer, which soon disintegrates or ruptures to release the spores.

«■ Gone with the wind. Left empty.

Mature puffballs are basically bags filled with spores. After the wind has carried away the spores, an empty bag remains. In the larger species the empty sac crumbles away, in small species it breaks loose from the soil and tumbles about freely in the wind.

-> Haemorrhages.

«= Anaesthetic/ narcotic.

Puffiness/ Enlarged

» Delusion: distances are enlarged; objects are enlarged.

<= Feeling of distension.

« Head as if enlarged [during headache].
® Feeling in occiput as if everything would protrude.
<· Eyes as if distended.
«· Swelling of nose with constant feeling of catarrh. [H]
= Cheeks and lips as if swollen.
= Cheeks as if about to burst from heat.
= Swelling of upper lip.
= Swelling of cervical glands.
«■ Flatulent distension.
= Abdomen puffed up at single spots.
« Intolerance of clothing around waist. [Pressure <.]
= Heart as if enlarged.
<= Oppression of the chest; must frequently sigh in order to get a full breath; cannot bear anything on the chest; and his large waistband seemed too small. [S]
= Oedematous swelling of feet.
= Chronic swelling of foot, after spraining it; cannot put on shoe. [S]
« Puffy condition of skin.
- Pitting oedema.

Discharging
= On waking at 3 a.m. very violent headache, in which he feels every pulsation, and which threatens to burst head asunder, gradually disappearing on outbreak of perspiration on head especially. [H]
= Lachrymation and copious urination during headache.
= Constant inclination to blow the nose [without discharge].
= Obstruction of nose at night/ while lying.
~ Frequent empty eructations, even before breakfast. [N]
= Much passage of flatus, after lying down in bed. [S]
« Very frequent passage of loud flatus, *followed* by distension of abdomen and colic. [N]

Clouds/ smoke/ fog
=» Anguish, feeling as if in a black fog. [P]
~ On rising in morning feeling as of veil before eyes. [H]
= Pressive pain and a feeling of heaviness in a small spot on the left side of the forehead, deep internally and pressing upon the eye; the pain returns soon with redoubled severity, whereby it seems as if there were a cloud

before the left eye, which disappeared by frequent wiping; in the morning on moving about. [N]
— Urine clear yellow, with a slowly forming cloud. [N]

Touch/ jar/ pressure

·» *Great sensitiveness;* became easily offended at everything. [S]
= Bruised feeling in whole body, especially in joints of arms and abdominal muscles, to touch, and on motion. [H]
• Great sensitiveness of the scalp generally to touch; she could not even endure the comb. [N]
=> Stitching or bruised pain on left side of vertex when touched. [N]
= Excessively painful pressure and twisting deep in right eye, involving orbit, which is sensitive to pressure, during menses. [N]
» Abdomen sensitive internally and externally, so that she could not bear it touched, and was obliged to walk bent. [N]
“ Right hand heavy as a hundredweight, with severe pain, as if bruised, in the place where the pulse is felt; it does not tolerate any touch. [S]

Tearing open

« Talkative. [S]
= Very openhearted; she spoke of her own failings, contrary to her custom. [S]
=» Indiscretion. Revealing secrets.
= Pains [headache] compel to cry out.
« Speech by jerks [puffs].

Opposite: enclosed

= Frightful dreams, that she was in a cellar and the walls were falling in; that she was obliged to remain and could not get out. [N]
Suffocation from carbon vapours [Hering]; asphyxia from charcoal fomes [Boericke].

Dryness

= Burning on tip and numbness of back part of tongue and over whole mouth, and dryness of throat for four mornings on waking, disappearing after eating. [N]
“ Great dryness in the throat, in the morning on waking, so that the tongue seemed almost like wood. [S]
= Thirstlessness; unquenchable thirst, in one who had previously never

needed to drink. [H]
« In evening in bed very violent pains in abdomen, as if all were dried up. [H]
= Dry cough in the morning after rising for half an hour. [N]
» Desire for bread.
« Dry food <.
« Dry weather >.

Skin

<· Extraordinary itching on right arm for several days, later on both arms, with biting and burning after washing; itching over whole scalp, extending to neck, especially when warm, so violent as to compel scratching, which does not relieve; same on coccyx, where after scratching a scurf appeared, lasting some days, (HJ
= Hands covered with small, dry, reddish pimples. [H]
« Much itching without eruption.
«· Acne due to use of cosmetics [= coal tar applications*]; < in summer.
» Formation of thick crusts.

* According to Hering, Bovista antidotes bad effects of tar, externally applied. Coal tar is used in cosmetics, including hair dyes, and medically to prevent itching and to treat chronic skin disorders. Coal tar derivatives, either in refined form or as cruder extracts [e.g. petroleum jelly], are frequent sources of allergic reactions, particularly skin rashes and hives, and may sensitize the skin to sunlight [hence the aggravation in summer]. Thus the symptom "acne," as mentioned by Boericke, can be extended to rashes, irritation, itching, urticaria, etc. Since coal tar is essentially a composition of carbonized and volatile constituents, the symptom "Suffocation from carbon vapours" belongs to the same category as the skin problems. Asthma after suppression of skin eruptions with coal tar derivatives may consequently be an indication for Bovista.

Emptiness [Deflation]

~ Lively in company; sad, depressed, and not interested in anything when alone. [S]
·> She is very absent-minded, makes mistakes in writing, leaves out whole syllables and writes several words entirely wrong. [H]
« So absent that she cannot, even with great exertion, pay attention to what is being said and done. [H]
=> Lost in thought; he often looked vacantly for several minutes. [S]
= Lost in thought; she looked a long time at one point. [N]

Frequent vertigo, with feeling as if his senses left him. [H]
« Sudden attack like faintness, while sitting at noon, as if objects turned upside down. [H]
= Disinclined to do any work. [N]
~ Head very much confused and empty, with drawing about the whole head, especially in the morning. [H]
=» A feeling in the stomach, as if one had fasted, even after eating. [N]
== Sensation of emptiness in chest.

Haemorrhages
«· A few drops of blood from nose every time she sneezes. [N]
= Bleeding of the nose in the morning. [S]
== Ready bleeding of gums [with toothache], pain > by sucking blood out of teeth with tongue. [H]
== As often as he sucks gums, blood oozes into mouth, and the gums pain; at times clear blood issues from gums without any sucking of gums. [H]
= Profuse bleeding of gums after tooth extraction.
= Menstruation irregular, sometimes too early, sometimes too late, accompanied by headache, toothache, and diarrhoea; often altered in quality. [N]
— The menses flow most profusely in the morning, but scanty during the day and night. [N]
« Traces of menstruation between the menses. [NJ
« Anxious dreams of serpents which had bitten her; that she would die; that she had a bleeding wound. [N]

Anaesthetic/ narcotic
= Great drowsiness after food. [H]
“ Right leg is utterly gone to sleep’ in whatever position it is placed. [H]
» Irresistible desire for sleep. [H]

II. ORDER PHALLALES

Contains 45 species in 25 genera. All are stinkhorns with morphologies ranging from simple to sophisticated. Stinkhorns start their life as an 'egg', to develop after 'hatching' into a more or less complex fruiting body. The spores, 'packed' in bad-smelling slime, are dispersed by animal vectors.

II A. FAMILY PHALLACEAE

Phallus impudicus

PHALLUS IMPUDICUS **Phal.**

Scientific name Phallus impudicus L.: Pers. 1801.
Common name Common Stinkhorn.
Family Phallaceae.

KEYS

- Saprophytic
- Unstoppable speed.
- Uncontrollable force.
- Compelling stench. "Lavatorial smell that attracts flies."
- Sulphur.
- Shameless shape.
- Shapeless flaccidity.
- Orgasm mushroom.

FEATURES

- Begins as an 'egg' which is followed by a stalk that ruptures the egg as it elongates with astonishing speed.
- Stalk capped with a slimy brown to olive-green conical head, giving off a lavatorial smell that attracts flies.
- Spores olive-green to olive-brown.

- Solitary or in clusters in woodlands, gardens, rich humus, or cultivated soil.
- Common. Summer to fall.
- Saprophytic.

SPECIAL FEATURES

Fungi are very strange organisms with peculiar, sometimes bizarre, signatures. Stinkhorns display some fascinating characteristics, the combination of which is not found in any other family of fungi. These special features consist of:

- Unstoppable speed.
- Uncontrollable force.
- Exquisite flavour.
- Compelling stench.
- Shameless shape.
- Shapeless flaccidity.

Speed and force

Stinkhorns emerge from "eggs," rounded puffball-like shapes the size of ping pong balls and partially buried in the ground. All of the stinkhorn's parts are fully formed, though greatly compressed, within the egg. Rather than growing or developing the cells of the stinkhorn merely *expand.* The expansion takes place with astonishing speed, so that it takes the fungus as litde as one to two hours to reach its full-fledged size of 8 to 10 inches tall. The expansion is so forceful that a stinkhorn egg will shatter the glass or earthenware vessel of its size in which it is enclosed. Ramsbottom cites Bulliard [1784] as saying that the egg always bursts with great force and explodes at times with a noise like a pistol shot.

Arora associates stinkhorns with unpredictability and spontaneity. "But the most distinctive thing about the stinkhorn is its utter spontaneity. In the words of one founding member of the New York Mycological Society, 'you never know when one is going to pop up right in front of you, so fast you can actually see it growing. And there is no way to predict or control them. It's the one thing in the world you can't push or hurry.' The stinkhorn has also a highly refined sense of poetic justice. One 'going strong' is said to have appeared in the concrete floor of the newly built house greeting a newly married couple. To accomplish this instructive feat, the mycelial cords had to force their way into the foundation from an old stump in the garden!"

Stench

The class Gasteromycetes [literally: "stomach-mushrooms"] comprises puffballs, earthstars, earthballs, false truffles, bird's nest fungi, and stinkhorns. Stinkhorns differ from other Gasteromycetes in having a slimy or sticky, putrid spore mass, which, at maturity, is as repulsive to our nostrils as it is appealing to flies.

Lured from afar by the cadaverous stench, flies, bluebottles, and carrion beedes alight on the cap, where they feast on the slime and in the process pick up the spores. "Baby stinkhorns use insect wings to fly away from their parents," says Nicholas Money. Attracted by the smell of rotting flesh, slugs come gliding for 20 or more feet to join in. So greedily do flies and beetles devour the slime, even wallowing in it, that they become almost comatose. Stripped of its slime and spores the cap is left naked and white within a few hours. The fungus soon becomes flaccid, collapses and liquefies. This process of deliquescence is speeded up by light. Specimens kept in a darkened place only very partially liquefy, instead drying up into a hard, black, shining mass.

Stinkhorn eggs are odourless but not tasteless. On the contrary, eggs are considered tasty with a "subtle, radish-like flavour" and in China washed mature specimens are thought to be the most exquisite of mushroom delicacies.

Rather than being praised for its flavour the skunk-like odour of stinkhorns has given cause for unfavourable comments, ranging from foul, obnoxious, horrid, intolerable, vile, odious, "intolerable foetor as of human excrement," and "like rotting meat," to "spermatic," "like the damp earthy smell we meet with in some of our churches on Sunday," and "enough to cause one to think that all the bad smells in the world had been turned loose."

Cooke [1893] describes it as faint, mawkish, but sweetish and honey-like at first, then somewhat fetid, and finally very strong and repulsively fetid. Money compares it with "a dead deer smell, a hint of sweetness too, and even a suggestion of semen; an odour that cannot be ignored." A favourite abode of this species, says Mcllvaine, "is in kitchen yards and under wooden steps, where, when mature, it will compel the household to seek it in self-defence."

Cooke relates that, whilst on a botanical excursion with a friend, "we discovered a fine *Phallus,* which had not fully acquired all its intensity of fragrance, and, as it was the first time our friend had seen this object, he was anxious to convey it home, and make its better acquaintance. All his sandwiches having been eaten, he resolved to employ his sandwich box as a vasculum, chiefly in order to preserve it from crushing. Thus entombed,

it was conveyed to his pocket, and we thought no more of it until some time after, when we were safely ensconced in the train on our way home. Shut up in a close compartment we soon became conscious that some of our fellow-travellers were evidently disconcerted, and cast inquiring eyes in all directions, some were even directed under the seats, in order to discover the source of some odour which was growing in intensity, and had already become patent to all. My friend had become painfully conscious of eyes wandering towards him, but he sat with stolid indifference, as if unconscious of any disturbing element, until, one by one, the passengers vacated our compartment, as soon as circumstances permitted, and we were left to travel alone. It is not absolutely certain, but an impression remains that the sandwich box was quietly emptied of its content, out of the carriage window, before we arrived in town. This incident will convey some impression of what the odour of a 'stinkhorn is like, when in perfection."

Something similar happened to a botanist who, after gathering a stinkhorn for the purpose of drying it for his herbarium, was compelled by the stench to rise during the night and cast the offender out at the window. It is said that houses in which a skunk has released its pervasive stink have to be abandoned and aired for several months, which matches the stinkhorn-induced experience of a family moving into a house built in a spinney at Leicester in 1935. The source of the smell could at first not be traced, so that they had all the drains and sewers overhauled and at one time were forced to leave the house altogether for a month.

Impudicity

In Devon, England, Phallus impudicus is locally called 'snake-comb,' in the belief that snakes emerge from it, to which the disgusting odour is thought to be due. The unusual fruiting body of the stinkhorn, with its extraordinary phallic resemblance, has proven impossible to ignore. The resemblance is indeed stunning. Both Phallus and penis swell up due to pressurized fluid and both become flaccid rapidly after performance, having served their purpose as spore or sperm disperser.

The appearance of this "jest by Satan," suggests Money, was too much to bear for Victorians, who were "sufficiently obsessed with sex to become excited by table legs." That stinkhorns were creations of the Devil seemed manifest to Charles Darwin's eldest daughter Etty, who, in Queen Victoria's reign, "so despised stinkhorns that she mounted an antifungal jihad with the aid of gloves and a pointed stick." Gwen Raverat in her book *Period Piece*

[1952] writes about the censorial activities of Aunt Etty.
“In our native woods there grows a kind of toadstool called in the vernacular The Stinkhorn [though in Latin it bears a grosser name]. The name is justified, for the fungus can be hunted by the scent alone; and this was Aunt Etty s great invention. Armed with a basket and a pointed black stick, and wearing a special hunting cloak and gloves, she would sniff her way round the wood, pausing here and there, her nostrils twitching when she caught a whiff of her prey. Then with a deadly pounce she would fall upon her victim and poke his putrid carcass into her basket. At the end of the day’s sport the catch was brought back and burnt in the deepest secrecy on the drawing room fire with the door locked - because of the morals of the maids.”

> A brave soul, Aunt Etty, to have preserved the virtue of the maidens of Britannia! If a monument to her heroic gesture should be erected, it would prove most curious. But certainly such virtue should not go unrewarded. These phalloid fungi have led to endless incidents. The most recent occurred in France in 1926, when an Abbe was beaten by the adherents of a sect called Our Lady of Tears’ in hopes of freeing him from diabolical possession. His possession by the devil had led the Abbe to send a flock of demonic birds to Bordeaux, where their excrements, landing in the garden of the sect’s founder, gave rise to fungi “of obscene shapes which emitted such appalling odours that those who inhaled them were smitten by horrendous diseases.” For this action the Abbe was grievously injured, resulting in a dozen adherents of the sect being incarcerated.
> [Emboden 1974]

Aside from being offensive to the eye and to the nose, touching the fungus was believed to cause dreadful diseases, let alone what would happen to a person ingesting it. Illustrative for the stinkhorn hysteria is the case of a young female who ate a morsel of the Latticed Stinkhorn [Clathrus ruber], the receptacle of which “resembles a spherical network or lattice-work of coral, but is of so putrescent a nature that its odour materially detracts from its beauty.” The young woman “was seized with violent convulsions, lost the use of her speech, and ultimately fell into a stupor which lasted forty-eight hours: prompt attention was given to her, but it appears to have been some months before she was perfectly cured.”

CLINICAL MANIFESTATIONS

Not much is further known about the clinical effects of Phallus impudicus. Its smell causes in many people, according to Lewin, "irritation of the throat, a sensation of rawness in the chest, nausea and vomiting," whilst ingestion of the fungus reportedly results in abortion. Sheep, after eating the fresh mushrooms, behave like rabid dogs, attacking humans with widely opened mouths and attempting to bite.

Ingredients of stench

The slime contains a cocktail of volatile compounds, including hydrogen sulphide, formaldehyde, methylmercaptan, and unique compounds called phallic acids. The cocktail makes stinkhorns more often smelt than seen. Some clues regarding the possible effects of stinkhorns may be derived from the chemicals responsible for the noxious odour.

The flammable gas *methylmercaptan* [methyl sulfhydrate or methanethiol] occurs in coal tar, petroleum distillates, and rotten cabbage. It is isolated from roots of *Raphanus sativus* [radish], as well as produced in the intestinal tract by the action of anaerobic bacteria on albumen. [Stinkhorn eggs, interestingly, have a radish-like flavour.] Overexposure to the gas results in drowsiness, cyanosis, convulsions, and pulmonary irritation.

Hydrogen sulphide evolves from numerous environmental natural sources such as bacterial decomposition of vegetable and animal protein material, occurring in liquid manure pits, sewers, and tanneries. It occurs naturally as a component of crude petroleum, natural gas, volcanic gas and sulphur springs. It is a flammable gas with a distinctive smell of rotten eggs, highly toxic and potentially fatal in high concentrations. Poisoning resembles that of cyanide and interferes with the body's oxygen supply. Mild exposure causes painful and reddened eyes, photophobia, and blurred vision, seeing coloured halos around lights, lachrymation, rhinitis, laryngitis, and cough. Potential symptoms of overexposure by inhalation include confusion, fatigue, cyanosis, sweating, giddiness, headache, salivation, gastrointestinal disturbances, tachycardia, and pulmonary oedema.

Formaldehyde [methyl aldehyde], a colourless, flammable, pungent, suffocating gas, is formed by incomplete combustion of many organic substances. It is present in coal and wood smoke, especially in smoke as produced for smoking ham and fish. It is found in the atmosphere, especially over large cities, and in many everyday products such as antiseptics, disinfectants,

adhesives, resins, foam insulation, textile finish, wrinkle-proof fabrics, and plywood. Exposure to formaldehyde vapours may cause urticaria, and more or less marked irritation of the mucous membranes, resulting in conjunctivitis, swelling of the eyelids, rhinitis with loss of smell, and pharyngitis. Higher concentrations may cause laryngospasm, glottis oedema, and tracheitis. Ingestion of formaldehyde [solutions] is immediately followed by burning pain in mouth, pharynx, oesophagus, and gastric region, severe abdominal pain, vomiting, diarrhoea, sudden loss of consciousness, liver failure, collapse, with death from circulatory failure.[1,2]

1 The Merck Index, 12th edition. 2 Von Oettingen 1958.

THERAPEUTICS

Stinkhorns, used as ointments and potions, have a reputation throughout history as folk-remedies for various ailments, ranging from sores and gangrenous ulcers to gout and epilepsy. Success has been reported in the 19th century with a tincture of the fungus as an antispasmodic to relieve pain during attacks of renal colic, while, on the other hand, it was seriously suggested in a letter to *The Times* in 1865 that stinkhorns were probably the cause of cholera and similar epidemics. The antispasmodic effects were observed by the British physician W.C. Radley, who furthermore asserted that the tincture possessed "great remedial power to allay pain in the lumbar region."

> *Phallus impudicus,* the "orgasm mushroom," is nothing new and enjoys a rich folklore in many lands. A glance at the genus may explain where its reputation comes from. ... Hadrianus Junius, in his *Phalli: A Description with Pictures from Life of the Fungi Growing Occasionally in the Sand of Holland,* wrote the following about the mushroom in the 16th century: "[It] is very effective for intense and unbearable pains in the joints, above all those caused by passions and limitless debaucheries that exceed the limits of license."
>
> The mushroom is used in New Guinea to encourage cattle to breed. In traditional Chinese medicine, it is used to relieve rheumatism. It is a folk remedy for ulcers, asthma, gout, and other ailments in Latvia.
>
> [Halpern & Miller 2002]

Although stinkhorn preparations take on an aura of the cure-all, there is some clinical experience and scientific interest in the use of it in ointments for the treatment of cancer.

> In Latvia, Katzen and Gurvich experimented with an ointment made from 25% fresh juice of the stinkhorn mushroom in the 1960s and 1970s for malignant tumours with promising results. Information from Russia about the stinkhorn mushroom ointment states that its scope of application includes wound healing, benign ovarian cystomas, uterine fibroids, as well as ovarian, uterine, and breast cancers [Tauki, 1994]. The author states that if the ointment does not produce a result after 1 month, further use is pointless.
> Recent research being performed in Riga, Latvia at the Latvian Medical Academy on the fermented succus of the stinkhorn has shown one active fraction to be a glucomannan called PI-2. Sterols and phenol-carbolic acids were also identified. In laboratory tests with animals, the succus stimulated cytotoxic T-cells, and enhanced the activity of natural killer [NK] cells, demonstrated as anti-stress and adaptogenic activity as well as an antitumour effect with sarcoma 180 and Ehrlich ascites carcinoma and reduced the haemotoxic effects of the chemotherapeutic agent, 5-FU [Kuznetsovs & Jegina, 1993].
> [Hobbs 1995]

APHRODISIAC

In many parts of the world phalloid fungi [stinkhorns] have been used as aphrodisiacs. Netted Stinkhorns [Dictyophora spp.] resemble Stinkhorns [Phallus spp.] in shape, size, colour, texture, and smell, the only difference being that Dictyophora's have a lacy veil hanging down as a skirt from within the cap. The lacy veil "feminizes the phallic effect a little." [Dictyophora was previously called *Phallus impudicus* var. *togatus* \

Saprophytic
Unstoppable speed.
Uncontrollable force.
Compelling stench.
Sulphur.
Shameless shape.
Shapeless flaccidity.
Orgasm mushroom.

An ancient legend, known throughout Polynesia, Tahiti, Samoa, Hawaii and the Marquesas, tells of women who encounter specimens of the Dictyophora genus and go into fits of sexual ecstasy. The fungus is known as "Mamalu O Wahine" [Woman's Mushroom]. Women living on the Big Island of Hawaii reportedly gather to seek out the fungus because its odour is arousing when

sniffed. To confirm or deny the reputed effects a small test was done consisting of sniffing a fresh specimen by a number of randomly chosen subjects, both male and female. “Of 20 males who took part, all found the smell repulsive and declined any further testing. No physiological responses were noted in any of the male test subjects. Women, however, found the smell pleasant. In a controlled clinical trial involving 16 women, six had orgasms while smelling the fruiting body of the fungus. The other 10, who received smaller doses, experienced physiological changes, most notably increased heart rates.”[1]
It is speculated that the volatile compounds present in the fungus are closely similar to compounds [sex pheromones] released in human females during sexual encounters. The effects were obtained by sniffing the fungus, not by ingesting it. Chinese researchers of Hunan Medical University investigated the non-volatile elements contained in the fruiting body of Dictyophora indusiata and found medium to high contents of zinc, manganese, chromium, selenium, and vitamin E.

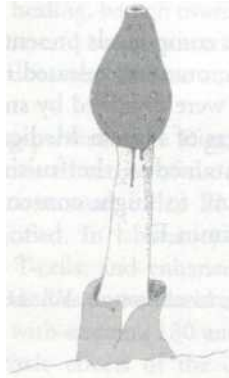
1 Ben Sostrin - Mamalu O Wahine; MushRumors, Vol. 41, May-June 2002.

MATERIA MEDICA

Based on a self-experimentation in 1865 by Kalieniczensko, who took five or six spoonfuls of an infusion of *Phallus* in 24 hours.
“There is a general resemblance to the effect of the *Agarici,”* says Clarke, “vertigo, disordered vision, gastrointestinal disturbance and viscid sweat.”

Symptoms [in Allen]
= Vertigo.
= Vision difficult; obscured.
= Objects seem coloured grey, as in smoke [followed by vertigo].
= Profuse salivation.
~ Great dryness of the throat, & irritation, as from black pepper.
<= Loss of appetite.
= Violent vomiting & profuse salivation.
= Pain in stomach and abdomen.
= Devouring thirst.
= Painful sensitiveness of whole abdomen.
~ Watery diarrhoea.

~ Urine deep red, depositing sediment of urates of calcium and sodium.
« Dry, oppressive cough.
= Sensation of rawness in chest [Lewin].
= Profuse, viscid perspiration.
«= Sleepiness.
= Great feebleness of whole body.



Phallus impudicus

III. ORDER SCLERODERMATALES

Contains 38 species in 11 genera. Earthballs or False Puffballs [as opposed to true puffballs].

Ill A. FAMILY SCLERODERMACEAE

Scleroderma citrinum

SCLERODERMA CITRINUM **Sclero-c.**

Scientific name Scleroderma citrinum Pers. 1801.
Synonyms Scleroderma aurantia L.: Pers. 1801.
Scleroderma vulgare (Fr.) Hornem. 1829.
Common names Common Earthballs. Pigskin Fungus.
Family Sclerodermataceae.

KEYS

- Thick, leathery, single-layered skin with large, scaly warts.
- Mutualistic [symbiotic].
- Deep sleep followed by restlessness.
- Tingling/ numbness, descending.
- Stiffness.
- Cellulite.

FEATURES

- Shaped like a scaly potato, as is implied in the German name Kartoffel Bovist [potato bovist].
- Possesses a thick, hard, leathery skin consisting of a single layer. [Double in Bovista.]
- Skin cracked and lumpy, lemon-yellowish to yellow-ochre, with large scaly warts.
- Spore mass white at first, purplish black at maturity, traversed by whitish vein and with a pungent, earthy odour.

• The spores are liberated in the same fashion as puffballs by the breaking or weathering of the peridium [skin].
• Pungent taste. Smell "at first aromatic, then disgustingly acrid."
• Often confused with *Lycoperdon* and sometimes with truffles.
• Because of the marbled flesh sliced earthballs are sometimes sold as truffles or used to adulterate them, despite the fact that its taste bears no resemblance to that of the truffle. "Pate de fois gras, galantine and dinde and poularde truffee are the vehicles of this deceit in cheap continental restaurants," warns Ramsbottom.
• Major difference is that true puffballs are saprophytic whilst Sclerodermas are mycorrhizal [symbiotic]. Scleroderma and allied family members appear to promote the rapid growth of trees under normally adverse environmental conditions.
• Widespread on acid soils in deciduous [oak, birch] and coniferous [pine] forests, on heaths and moors. Summer to late autumn.

CLINICAL MANIFESTATIONS

• Feeling personal experience to be important, Adrian Morgan discovered "that as little as half a small specimen [of Scleroderma citrina] causes a deep sleep, as little as fifteen minutes after consumption and lasting two hours. This is followed by a period of restlessness, during which pupils are strongly dilated." He also noted some visual disturbances.

Thick, leathery, single-layered skin with large, scaly warts. Mutualistic [symbiotic]. Deep sleep followed by restlessness. Tingling/ numbness, descending. Stiffness. Cellulite.

The poisoning symptoms of Scleroderma resemble the symptoms that came out of the provings with Bovista. Several Scleroderma poisonings have been reported in literature. A woman and a friend ate what they thought were puffballs, although the specimens were purple inside. "Symptoms began with a tingling or numbness in the nose, tongue, and fingers and feeling 'not quite right'. An hour and a half later, she felt a little worse, vomited once, felt shaky, cold, weak and generally uncomfortable.
The following day she was still tired and slow moving and had difficulty concentrating on her usual computer work.
The friend also experienced tingling, numbness and felt dizzy. His heart felt like it was beating rapidly, he vomited twice and he also felt weak. The next day he went to work but was too dizzy to stay on the worksite. The woman identified the fungi as Scleroderma citrina but no sam-

pies were left for verification of species."[1] Another report describes the case of a young man who took a small bite from a raw Scleroderma cepa [Smooth Earthball]. "Thirty minutes later he developed a general feeling of weakness, stomach pains, nausea, and a tingling sensation over his entire body. Within 45 minutes of eating the fungus he was very pale and developed general muscle rigidity, stomach cramps, and profuse sweating. He was driven to a hospital and was so stiff that they had trouble getting him out of the car. They tried to insert a tube to empty his stomach but were unable to do so. Still conscious, he signalled that he wished to be rolled onto his stomach, whereupon he made himself vomit. He then started to feel better rapidly and his symptoms soon resolved."[2]

In another case, severe abdominal pains were followed by cramps and paralysis. Arora relates briefly the case of a man who ate a small piece of Scleroderma laeve under the impression that all "puffballs" were edible. "Twenty minutes later he broke into a cold sweat, felt nauseous, and started vomiting. After expelling the offender, he recovered quickly."

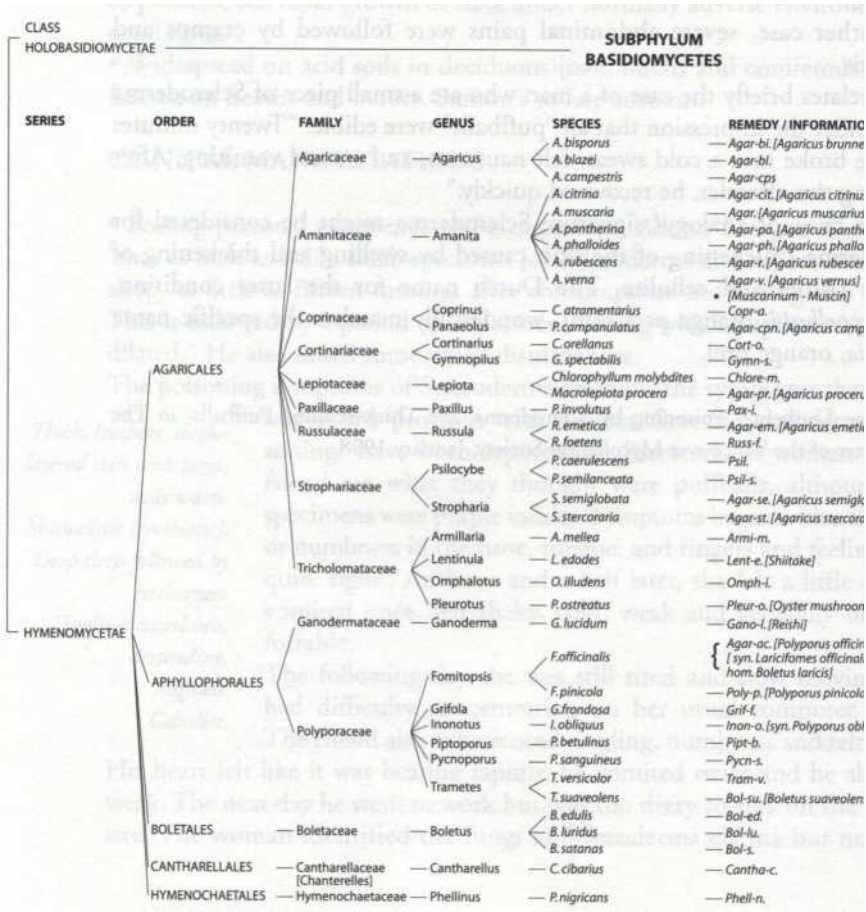
On the basis of analogy/ signature Scleroderma might be considered for scleroderma [thickening of the skin caused by swelling and thickening of fibrous tissue] and cellulite. The Dutch name for the latter condition, *sinaasappelhuid* [orange peel skin], wonderfully matches the specific name *aurantia,* orange peel.

1-2 Anne Leathern - Poisoning by Scleroderma, the Thick-skinned Puffballs; in The Newsletter of the Vancouver Mycological Society, January 1998.

SERIES HYMENOMYCETAE

Hymenomycetes form the hymenium, or fruiting surface, on the outside. This series includes the families comprising the gill fungi, pore fungi, coral fungi, tooth fungi, and the bracket fungi.

ORDER AGARICALES
ORDER APHYLLOPHORALES
ORDER BOLETALES
ORDER CANTHARELLALES
ORDER HYMENOCHAETALES



I. ORDER AGARICALES

I A. FAMILY AGARICACEAE

Agaricus bisporus
Agaricus blazei
Agaricus campestris

AGARICUS BISPORUS **Agar-bi.**

Scientific name:	Agaricus bisporus (J.E. Lange) Imbach 1946.
Synonyms	Agaricus brunnescens Peck 1900.
	Psalliota hortensis f. bisporaJ.E. Lange 1926.
	Agaricus hortensis (Cooke) J. Imai 1938.
Common names	Button Mushroom. "Champignon".
Family	Agaricaceae.

KEYS

- "Champignon"; supermarket mushroom.
- Saprophytic.
- Very common under cypress.
- Allergic reactions.
- Oestrogen.

FEATURES

- White cap [with brown fibrils] and flesh.
- Gills pinkish at first, turning chocolate-brown in age, and finally blackish-brown.
- Spores chocolate-brown.
- Scattered to densely gregarious or in clumps in compost and manure, rich soil, along paths and in gardens. Very common under cypress, but only rarely found in woods or on lawns. [Arora]
- Saprophytic.

- Odour mild or faintly fruity.
- Commercially cultivated supermarket mushroom.
- Cultivated varieties of A. bisporus include the coffee-coloured crimini and portobello mushrooms.
- Nutrient composition: about 2% protein [containing all the essential amino acids]; about 5% carbohydrates; large amounts of potassium, chlorine, phosphorus, copper, selenium and zinc; some vitamin E; most B vitamins but no Bl2.

CLINICAL MANIFESTATIONS

- Workers in canneries who prepare button mushrooms are sometimes subject to keratitis, lachrymation, and other ocular affections accompanied by such constitutional symptoms as vomiting and jaundice.

- "Some people have allergic reactions to eating the cultivated mushroom, *Agaricus bisporus,* and a large variety of edible wild mushrooms; they suffer otherwise unexplainable bouts of sudden vomiting, nausea, diarrhoea, abdominal pain, headaches, and hives. Mushrooms, both cultivated and wild, have been classified as major food allergens, and the allergic reaction is possibly due to the proteins in the mushrooms." [Lincoff & Mitchel]

- In addition to the gastrointestinal symptoms, one woman had, after eating the tiniest piece of a button mushroom, overpowering sleepiness and the strange desire to let her tongue hang out of the mouth.

- Almost all the research on this edible mushroom has focused on its dangers. The prime suspect is a compound named agaritine, a hydrazine derivative that is anticipated to be carcinogenic. Agaritine has been reported from at least twenty different Agaricus species and appears to be characteristic of the genus Agaricus only. Carcinogenicity of raw *Agaricus bisporus* fed orally to mice has been demonstrated. Such artificially induced results cannot, of course, be automatically extrapolated to the human situation for "tests show that one might have to consume as much as 350 grams of fresh mushrooms daily for 50 years for there to be a significant risk with actual human consumption." [Hobbs]

'Champignon"; supermarket mushroom. Saprophytic. Very common under cypress. Allergic reactions. Oestrogen.

• Research on the health benefits of Agaricus bisporus, including the crimini-variety, suggests, on the other hand, that the common button mushrooms possess *anticancer* properties and particularly "may help protect against the development of breast cancer by preventing circulating levels of oestrogen in the body from becoming excessive. Excessive oestrogen, or hyperoestrogen- emia, has been repeatedly linked to increased risk of breast cancer. This effect appears to be accomplished through inhibition of an enzyme in the body called aromatase [oestrogen synthase] that is necessary for the production of oestrogen."[1]

1 The George Mateljan Foundation - Phytonutrient Protection Against Breast Cancer.

Scientific name	Agaricus blazei Murrill 1945.
Synonym	Agaricus brasiliensis?
Common names	Royal sun agaricus. Murrill's agaricus. Almond portobello. Brazil mushroom.
Family	Agaricaceae.

AGARICUS BLAZEI

Agar-bl.

NOTE: Some mycologists have suggested that Agaricus brasiliensis [S. Wasser et al.] is the correct name for this culinary-medicinal mushroom widely cultivated in China, Japan and Brazil. The renowned American mycologist W.A. Murrill [1869-1957] was the first to document the species after finding a specimen on a lawn in Gainesville, Florida, in 1944. A specialist in agarics, he named it Agaricus blazei. The debate now rages whether the North American, the South American, and the Japanese varieties are strains of the same species or altogether different species. "Made from dried mushrooms sent from Hong Kong 1979," the remedy is available from Helios Pharmacy, UK, under the name Agaricus blazei Murrill. The location where it was collected suggests that it concerns the right species.

The common name Almond portobello, although infrequently used, may cause confusion with the Almond mushroom [Agaricus subrufescens].

KEYS

- Favours warm and humid conditions.
- Likes the sun.
- Loves thunderstorms.
- Saprophytic.
- Benzoic acid.
- Balance between deficiency and excess.
- Sensation of being under attack.

FEATURES

- Found in South America and the south-eastern United States.
- Prefers open spaces and high humidity [80%].
- Found in pastures, by the roadside and in open fields, especially where mules [dung!] are in use.

• Emits a strong aromatic almond-like scent.
• Different opinions as to its temperature requirements: generally believed to thrive best in temperate regions with ambient temperatures ranging from 23° to 28°C, in contrast to the occasional assertion that it favours wide gaps in daytime and night-time temperatures.

HISTORY

Favouring the humid, hot-house environment of its native Brazil, contrary to other agarics, which prefer shade and dampness, the origins of Agaricus blazei can be traced to a small mountain town in Brazil called Piedade.

> For centuries, the inhabitants of the town and its environs have savoured a mushroom that they call *Cogumelo de Deus* ['the mushroom of God'], *Cogumelo do Sol* ['the sun mushroom'], or *Cogumelo da Vida* ['the mushroom of life'].
> In 1965, two events transpired to bring the rare mushroom to the attention of the world. In the summer of that year, a Brazilian farmer of Japanese descent named Takahisa Furumoto was roaming the mountains beside Piedade when he noticed an unfamiliar but tasty mushroom. The mushroom appeared to be of the *Agaricus* family. Furumoto sent spores of the mushroom to Inosuke Iwade of the Iwade Research Institute of Mycology in Japan. To learn more about the mushroom, Iwade, a scholar in the field of mushroom cultivation, attempted to grow the mushroom in his laboratory, an attempt that would take nearly a decade.
> Meanwhile, back in Piedade, a group of scientists led by Dr. W.J. Cinden of Pennsylvania State University had begun their own investigation into the unknown *Agaricus* mushroom. Cinden and his colleagues had come to Piedade to find out why the inhabitants of the town had low rates of geriatric disease and a reputation for longevity. He concluded that the people of Piedade enjoy long life because they eat an unusual mushroom of the *Agaricus* family as part of their diet. Dr. Cinden published his findings in *Science* magazine and presented his conclusions at several conferences. Word about the unusual mushroom from Brazil began to spread.
> [Halpern & Miller 2002]

GROWTH REQUIREMENTS

An increasingly popular health food, the Brazil mushroom is in high demand. Already a rare species, it reportedly can no longer be found in nature. Yet, growing it turned out to be exceedingly difficult due to its very particular nutritional requirements. It requires very specific climatic conditions. After 10 years of trial and error, Dr. Iwade finally succeeded in artificially cultivating the mushroom for the first time in Japan in 1975, the result of which is now known as the 'Iwade Strain 101a'.

Currently, it is cultivated in various parts of the world including Brazil, Japan, Korea, Indonesia and the US.

Various methods for artificial growth have been developed, with pasteurised horse [or cow] dung, composted straw and residue of pressed sugar cane as the most commonly used substrates. Some growers claim that a high betaglucan content can be produced by growing the fungus directly on grain, specifically organic rye grain. It is grown indoors in laboratories and artificially controlled greenhouses, and outdoors where its natural climatic conditions can be replicated. In a mountainous area at 1200m above sea level, a local farmer recently succeeded in growing Brazil mushrooms in Taiwan with the technical assistance of a university research team. The success was attributed to the combination of similarity in natural climate and climatic features with its natural habitat in Brazil. Interestingly, the farmer said to have observed that "the mushrooms tended to grow faster whenever there was thunder and lightning and that they would stop growing if anybody touched their stems."

The thunder and lightning-part throws some new light on the old folklore belief, discarded as superstition, that mushrooms tend to pop up after thunderstorms. This is more than a silly superstition because lightning, as part of the natural fixation of nitrogen, binds the free atmospheric element into a compound which precipitates dissolved in rainwater, thus acting as a natural fertilizer and increasing the reservoir returned to the soil by animals as urine or dung, the latter being a growth requirement for Agaricus blazei [and other nitrogen-loving fungi].

BENZOIC ACID

The mushroom contains relatively high concentrations of benzoic acid. Upon investigating its pleasant almond flavour, it was observed that benzaldehyde

and its precursor benzoic acid were the major components of the volatile fraction. Due to its preservative properties, the high benzoic acid level is thought to contribute to the excellent shelf life of the mushroom. Because benzoic acid also occurs in several close relatives of A. blazei, e.g. in anise- scented agarics, it has been suggested that the compound could well be a taxonomic marker. *
Apart from certain agarics, benzoic acid occurs naturally in cherry bark, raspberries, cranberries, prunes, cinnamon, cloves, tea, anise, and cassia bark. It is used as a preservative in foods [E210] and medically as an antifungal agent! A mild irritant to the skin, it can cause allergic reactions such as asthma, red eyes, rhinitis, and urticaria, especially in people sensitive to aspirin.

* Tjakko Stijve et al. [2004], Characterisation of flavour and taste compounds in Agaricus blazei Murrill sensu Heinem., the cultivated almond mushroom. Australasian Mycologist 22 (3): 116-122.

BETA GLUCANS

Beta-glucans - polysaccharides formed by a chain of glucose molecules - are found in nature in such sources as cereal grains [barley, oats, corn bran], mushrooms [Agaricus blazei, maitake, reishi, shiitake], algae, bacteria, and yeast. Best studied of the mushroom beta-glucans is lentinan from Lentinula edodes [shiitake].
Extracted from the soluble part of fibrous foods or from the cell walls of baker's yeast, and purified by removal of all fats and proteins, beta glucans are available as dietary supplements. Although proposed for a host of afflictions - from wound healing to cancer treatment - clinical trials appear to support the following applications:

• Reduction of risk of coronary heart disease by lowering blood cholesterol levels [particularly beta glucans extracted from oats or barley].
• General tonic to improve host resistance to all types of infections.
Barley has an ancient reputation as a food for potency and vigour. Roman gladiators, called *hordearii* [barley eaters], ate the grain to build strength. Oats [Avena sativa] qualifies as a general tonic. Boericke deems it the "best tonic for debility after exhausting diseases." Concerning fungi and vigour, I think that the repertory rubric 'Sensation of strength' should contain

more fungi than the three it holds now.

- Inhibition of tumour growth and enhancement of survival rates.
- Reversal of radiation damage.

The mechanism of how beta-glucan stimulates the immune system is poorly understood. The substance does not seem to display much, if any, biological activity. Built of huge molecules, beta-glucan is hard to digest. One generally accepted theory has it that beta-glucans trick the immune system into reacting as if it is under attack by bacteria. Halpern & Miller put it thus: "It appears that beta-glucan molecules resemble the molecules found on bacterial cell walls. In effect, beta-glucan molecules are phantoms that make the body believe it is being invaded by a bacterium. When macrophages encounter a beta-glucan, they believe they have encountered a bacterium and they attack. ... The immune system believes it is under attack and it goes into a state of high alert. It takes all the measures it normally takes when it detects the presence of a virus, bacterium, or tumour cell."
One theory is that beta-glucan can help prevent asthma because beta-glucan molecules are similar in shape to those of *mycobacteria,* exposure to which helps to build up the T cell response that prevents asthma.

REDUCTION OF ADVERSE EFFECTS OF ORTHODOX CANCER TREATMENT

Agaricus blazei is first and foremost associated with cancer treatment.
Its use as a regular part of the diet might be a contributing factor in the low incidence of a variety of adult illnesses among the indigenous peoples outside Sao Paulo, Brazil. Labelled as a "cancer cure" the fungus has been excessively touted or exaggerated by promoters due to its much higher levels of key polysaccharides [beta glucans] and other immunostimulant components in comparison to commonly used fungi such as reishi [Ganoderma], maitake [Grifola], shiitake [Lentinula], and yeast [Saccharomyces].
Brazilian health practitioners employ the fungus in the form of Agaricus Drops,' a concentrated viscous extract of which twice daily 30-40 drops are to be taken in the treatment of breast cancer, ovarian cancer, alimentary tract tumours [oesophagus, stomach, small intestine], lung cancer, gastric ulcers, or viral infections.
A Chinese research team studied in 1992-93 20 patients with malignant alimentary tract tumours, divided into a control group and an experimental

group of 10 patients each. Both groups received mainstream western medical treatment including radiotherapy, chemotherapy, and surgery, while the experimental group received additional treatment with Agaricus blazei extract for 3 months. While persisting or aggravating in the control group, symptoms such as mental condition, fatigue, anorexia, nausea etc. gradually improved in the experimental group.

The most significant differences were observed regarding the blood values. Although both groups experienced haemopoietic injury induced by the radiation and chemotherapy, the blood pictures of the experimental group remained in the normal range and even showed improvement, while those of the control group kept dropping all the way.

The study consequently concluded that Agaricus blazei both promotes haematogenesis and stimulates restoration of retarded myelopoiesis following radiotherapy and chemotherapy. The study confirmed earlier Chinese findings as to the myelopoietic effects of Agaricus blazei in acute nonlymphocytic leukemia. “Study and utilization of Agaricus Blazei should be continued as one supplemental method of therapy for acute leukemia because it increases the desirable effect of chemotherapy through reducing the side effects and reinforcing the durability of the body.”

Favours warm and humid conditions. Likes the sun. Loves thunderstorms. Saprophytic. Benzoic acid. Balance between deficien and excess. Sensation of being under attack.

HOMEOSTASIS

Agaricus blazei seems to have the ability to maintain a balance between psoric defiency and sycotic excess. On the one hand it revitalises what has been weakened by stress, poor eating habits, pollution, etc., while on the other hand it reduces excessive immune reactions, e.g. those resulting in atopic dermatitis, asthma, pollinosis, or rheumatism. It falls into the ‘psoric’ category by activating metabolism and stimulating defences, and into the ‘sycotic’ category by levelling excesses in blood pressure, blood sugar, and cholesterol.

SIDE EFFECTS

Agaricus blazei Murrill [ABM] is available whole, in freeze-dried extract form, in capsules, in liquid extract, and as a granulated powder. The product is used for therapeutic purposes or as a dietary supplement.

No adverse effects have been reported other than the most common side effects of mushroom products in general - nausea, gastrointestinal upset, increased thirst and/or allergic reactions.
According to others, however, Agaricus species belonging to the subgroup Arvenses, which contains the yellow-staining varieties, should be approached with considerable circumspection. Members of the subgroup are capable of accumulating heavy metals, e.g. cadmium and mercury, from the soil and, in addition, tend to produce agaritine, a methylphenylhydrazine-compound suspected to possess carcinogenic properties. Agaricus blazei is classified in the subgroup Arvenses.

HOMEOPATHY

If John Henry Clarke's assertion is accurate that "it is often found that the physical characteristics of substances correspond with their dynamic influences," the physico-chemical properties of Agaricus blazei will provide an outline for its homeopathic use, to be fleshed out further by provings and clinical experience.

Agaricus blazei

AGARICUS CAMPESTRIS **Agar-cps.**

Scientific name	Agaricus campestris L.: Fr. 1821.
Synonym	Psalliota campestris (L.) Gillet 1872.
Common names	Meadow Mushroom. Field Mushroom. Pink Bottom.
Family	Agaricaceae.

KEYS

- Wild cousin of the supermarket mushroom.
- Saprophytic.
- Accumulates cadmium and mercury.
- Gastrointestinal symptoms.

FEATURES

- Wild cousin to the supermarket mushroom, called “le champignon” by the French.
- Cap white, sometimes with scattered brownish scales.
- White flesh, turning pale pink when cut.
- Gills pale pink at first, then bright pink, turning chocolate-brown in age, and finally blackish-brown.
- Spores chocolate-brown.
- In groups or rings in lawns, pastures and meadows, cemeteries, golf courses, etc. Can also be solitary. May to November.
- Saprophytic.
- Edible. Mild odour.

HEAVY METALS

> Many species of the higher fungi - from a large number of different genera, including many of the best-known edible varieties - have been shown to concentrate or accumulate trace elements, including some of the toxic metals. This phenomenon was first observed in Europe in the 1960s and is of increasing concern as the environment becomes more and more polluted. ... Cadmium is strongly accumulated by members of the *Agaricus* genus, especially the species that stain yellow when handled and bruised. The concentration of this element in *Agaricus* appears to be due to a specific cadmium-binding protein.

However, the accumulation of heavy metals is not limited to the yellow Stainers, as *Agaricus campestris* has also been found to contain cadmium. The pattern of mercury accumulation is somewhat similar to that for cadmium. Fortunately, only a small proportion of the contaminating mercury is in the more toxic methylmercury form.
[Benjamin 1995]

MATERIA MEDICA

The drug picture is based on poisoning cases. This is strange because "le champignon" is "edible and excellent, both raw and cooked." Although even edible species may occasionally produce mild to severe vomiting and diarrhoea in some people, the severity of the effects recorded by Allen, however, indicate an amanitin-poisoning. Amanitin-containing mushrooms cause violent and persistent vomiting and diarrhoea, abdominal cramps, weakness, and dehydration. In the likely case of misidentification, the culprit will not have been Agaricus campestris, but probably Galerina autumnalis, an amanitin -containing mushroom with which it at other times also has been confused. Lincoff and Mitchell report "serious poisonings" where "G. autumnalis was mistaken for Agaricus campestris."

Wild cousin of the supermarket mushroom.
Saprophytic.
Accumulates cadmium and mercury.
astrointestinal symptoms.

While before 1912 mushrooms of the genus Galera were generally believed to be non-toxic and even edible, it was later shown to contain at least four species with deadly amounts of amanitins, G. autumnalis being one of them. Because there is no way to find out definitely, the symptoms given by Allen are here included for the record.

= Slight delirium.
» Eyes sunken, with livid circle.
= Face humid, hippocratic.
= Tongue red and parched.
= Nausea. Vomiting and purging of liquid matter.
« Abdomen retracted. Great abdominal pain at intervals. Severe colic.
= Respiration irregular.
= Depraved habit, leading to external suppuration and gangrene. Greenness of the skin. Formation of abscesses, which discharge a thin, ill-conditioned pus, and pass rapidly into suppuration and gangrene.
= Skin cold, covered with cold sweat.
■» Somnolence.

I B. FAMILY AMANITACEAE

Agaricus citrinus [= Amanita citrina]
Agaricus muscarius [= Amanita muscaria]
Agaricus pantherinus [= Amanita pantherina]
Agaricus phalloides [= Amanita phalloides]
Agaricus rubescens [= Amanita rubescens]
Agaricus vernus [= Amanita verna]
Muscarinum

Amanitas

• Both the Lily and the Rose aspire to the rank of Queen and until a third surpasses them, each may be deemed a Queen, judges William Cowper. Deciding which fungus should be granted royal status would likewise require a Solomonian judgement. The eligibility of the King's bolete [Boletus edulis] seems beyond dispute with regard to flavour, although the chanterelle, as to flavour, has been described as the "queen seductress." Charles Mcllvaine puts the Amanitas forward as the main nominees.

"They are the aristocrats of fungi. Their noble bearing, their beauty, their power for good or evil, and above all their perfect structure, have placed them first in their realm; and they proudly bear the three badges of their clan and rank - the volva or sheath from which they spring, the kid-like apron encircling their waists, and patch-marks of their high birth upon their caps."

AGARICUS CITRINUS **Agar-cit.**

Scientific name	Amanita citrina Pers. 1797.
Synonyms	Agaricus citrinus Schaeff. 1762.
	Amanita mappa (Batsch) Quelet 1838.
Common name	Yellow Death Cap.
Family	Amanitaceae.

KEYS

- Mutualistic [symbiotic].
- Pronounced smell of raw potatoes.
- Bufotenin. Toadstool.
- Cholera.
- Sopor and lethargy.

FEATURES

- Cap lemon yellow to green; viscid; whitish to pinkish warts, may wash off.
- Stalk 6-15 cm long; cap 4-12 cm broad.
- Abrupt, soft, rounded bulb at base of stalk.
- White flesh, stalk, gills and spores.
- Mycorrhizal. Common under hardwoods [oak and beech] and conifers.
- Has a pronounced smell of raw potatoes.

CLINICAL MANIFESTATIONS

Hardly anything is known about the effects evoked by Amanita citrina, apart from the fact that it has been found to contain bufotenin, alternatively termed mappin after the mushroom Amanita mappa [= A. citrina] from which it was isolated.

> The identification of bufotenin in *Amanita citrina* was relatively unnoticed until the discovery of the pronounced psycho mimetic effects of its isomer psilocin. Despite an early conflicting report, bufotenin is not centrally active in humans when taken orally in doses of up to 50 mg. At the low level [of bufotenin in A. citrina], it is unlikely that anyone could eat enough mushrooms to experience significant peripheral effects from bufotenin. This is in agreement with the lack of toxicity data on *A. citrina.* [Spoerke & Rumack 1994]

TOADS AND TOADSTOOLS

Bufotenin, a derivative of the neurotransmitter serotonin, occurs not only in the skin of toads but is widely distributed in plants and animals. Yet the association of toads with toadstools has the longest ancestry and is common throughout the world.

In Europe, what seems to bond toads and toadstools strongly is their shared role as potentially toxic “agents of death” and their close associations with magic and the supernatural. In Christian thought, both were seen to represent to dark and evil threads of nature’s tapestry. Both appeared in late medieval art in representations of hell. ... Urination is another strange feature bonding toads and fungi. Among tribes in Siberia who consumed hallucinogenic mushrooms, urine had a special magical significance. ... The urine of the toad was believed to be poisonous. ... Toads and mushrooms are also associated with spittle. In parts of Europe and Siberia, the hallucinogenic fungus fly agaric was said to originate from spittle dropped from the sky.
In parts of Europe, the fairy rings were said to be formed by the spittle [or urine or sperm] of the elves, and certain species of fimgi were said to derive from spittle or sperm. The toad in Europe was reputed to be able to spit out poison, and certain folk remedies involved spitting into the mouth of a frog or toad. In North America, it was believed that by spitting on a frog or toad’s back, the creature could be made to burst open, whereas alternatively, if the toad spat on a human it would cause warts.
[Morgan 1995]

MATERIA MEDICA

The repertory has three symptoms for Amanita citrina: Laziness and Unconsciousness, under Mind, and Deep sleep. Allen’s Encyclopaedia mentions: Coma and lethargy. Vomiting. *Violent true cholera.* Deep sopor.
The symptoms come from a poisoning case involving “a man, his wife, and three children,” who “ate to dinner carp stewed by mistake with *Amanita citrina."*

Mutualistic [symbiotic].
Pronounced smell of raw potatoes.
Bufotenin. Toadstool.
Cholera.
Sopor and lethargy.

The wife, the servant, and one of the children had vomiting, followed by deep sopor; but they recovered. The husband had true and violent cholera, but recovered also. The two other children became profoundly lethargic and comatose, emetics had no effect, and death soon ensued without any other remarkable symptom. The individuals who recovered were not completely well till three weeks after the fatal repast.
[Christison 1855]

AGARICUS MUSCARIUS

Scientific name	Amanita muscaria (L.: Fr.) Hook. 1797.
Synonym	Agaricus muscarius L. 1753.
Common names	Fly Agaric. Bug Agaric.
Family	Amanitaceae.

KEYS

- Mutualistic [symbiotic].
- "Esteemed by both maggots and mystics."
- Accumulates vanadium.
- Two sides: growing smaller or taller.
- Fearless or fearful.
- Increased strength.
- Enterprising.
- Visual sensory misperceptions.
- Death-dreamer; dream warrior.
- Fly-induced activity.
- Intercourse.

FEATURES

- Cap bright red to blood-red, scarlet-red, or orange-red when fresh, but often fading to orange, yellow-orange, or paler in direct sunlight or after a soaking rain.
- Cap with white to pale yellow warts [universal veil fragments], may be washed off by rain.
- White flesh, gills, stem and spores.
- Solitary or scattered to densely gregarious or in large rings in forests and at their edges.
- Cosmopolitan, but absent in the tropics. Common throughout most of the northern hemisphere. Spring to autumn.
- Mycorrhizal symbionts: pine, spruce, fir, larch, birch, and aspen.
- Sandy or peaty soil.
- Notable for its ability to accumulate *vanadium* [amavadin] and selenium from the soil.
- Poisonous and hallucinogenic - "esteemed by both maggots and mystics" [Arora],

CLINICAL MANIFESTATIONS

Psychiatric

Visual sensory misperceptions rather than true hallucinations; euphoria resembling alcohol intoxication; increased activity; manic behaviour; irritability; agitation; confusion; delirium. Periods of excitement alternate with periods of somnolence, deep sleep or stupor.

Neurologic

Incoordination; ataxia; hyporeflexia; drowsiness; coma ["death-like sleep"]. Seizures [primarily in children].

Sensory

Visual misperception of sensory stimuli; macropsia; changes in colour vision; echo images [seeing through walls]; blurred vision; diplopia; miosis or mydriasis.

Musculoskeletal

Muscle tremors; twitching; jerking; muscle cramps and spasms.

Gastrointestinal

Nausea; vomiting; diarrhoea; abdominal pain.

Respiratory

Respiration usually unaffected; slow and regular, as in deep sleep.

Dermatologic

Reddened, hot skin; profuse perspiration.

[Spoerke & Rumack 1994; Benjamin 1995]

- Peculiars

  "My stream of consciousness seemed notably empty, and when I contemplated writing down something about how I felt, I could think of nothing to say." [McDonald, self-experiment, 1978].

- Additional intoxication symptoms that have been observed: babbling; screaming; racing thoughts; euphoria progressing to muscle jerks. Deep sleep generally lasts 4-8 hours.

- Hangover is *often* observed the following day.

- "It is undoubtedly *poisonous* to a high degree," writes Charles Mcllvaine, the fearless fungophyle who, in the 1880s, saw on every side of the mountains of West Virginia "luxuriant growths of fungi, so inviting in colour,

cleanliness and flesh that it occurred to me they ought to be eaten." So absorbing did the delightful study of fungi become that Mcllvaine pursued it for more than twenty years, "with thorough intellectual enjoyment and much gratification of appetite as my reward." Mcllvaine thought it "necessary to personally test the edible qualities of hundreds of species about which mycologists have either written nothing or have followed one another in giving erroneous information." Despite his adventurous spirit as well as his iron stomach, feasting on Amanita muscaria, however, was even for Mcllvaine too much of a good thing. "A raw piece of the cap, the size of a hazelnut, affects me sensibly if taken on an empty stomach. Dizziness, nausea, exaggeration of vision and pallor result from it. The pulse quickens and is full, and a dreaded pressure affects the breathing. I have not noticed change in the pupil of the eye. Nicotine from smoking a pipe with me abates the symptoms, which entirely disappear in two hours, leaving as reminiscence a torturing, dull, skull-pervading headache. If, as is asserted on good authority, the Siberians use it as an intoxicant, they certainly suffer the accustomed penalty."

Mutualistic [symbiotic], "Esteemed by both maggots and mystics. " Accumulates vanadium. Two sides: growing smaller or taller. Fearless or fearful. Increased strength. Enterprising. Visual sensory misperceptions. Death-dreamer; dream warrior. Fly-induced activity. Intercourse.

• Andrija Puharich studied the effects of the fly agaric by conducting 'provings' on 37 volunteers.

> The studies were aimed first at evaluating the poisonous effects of the mushroom. To this end, I and other volunteers took the mushroom by chewing it, according to the method used in Siberia, in order to find out what the effects were. It must be said at the outset that the effects for each individual represented a difficult constellation of symptoms. But, in general, these are the symptoms noticed by most of the subjects.
>
> The first reaction noticed was that the skin would feel hot in some places and cold in other places at the same time. When a subject was observed, it was found that his skin was blotchy, red, and discoloured in some areas, and blanched and white in others. For example, one ear might be flaming red, while the other one would be an ivory white at the same time.
>
> Some individuals notice a disturbance of vision primarily in the form of blurring. ...
>
> The third effects was rather an objective one in that almost every individual experienced a lowering of the pulse rate, usually from the normal level of

seventy or eighty beats per minute to fifty or sixty beats per minute. There was a slight lowering of temperature in most individuals.

Some individuals reported a hypersensitivity to touch, to light, and to sound. Other individuals were not affected by such hypersensitivity at all. Some individuals noticed increased strength and endurance. For example, one subject had made a study of how long he could hold his breath. His previous record had been one minute and thirty-two seconds. Upon chewing a small piece of *Amanita muscaria* he found that he was able, with ease, to hold his breath for two minutes and thirty-two seconds as a maximum.

Interestingly enough, none of the subjects experienced any noteworthy psychic effects from the mushroom, either in the form of hallucinations or mental disturbances. There was a reason for this, in that I kept the dosage purposely minimal in all cases. I wanted to study the effects of minute doses of the mushroom. The literature had already supplied us with ample knowledge of the effects of massive doses of *Amanita muscaria* in the way of poisoning, drunkenness, disorientation, and hallucination.

Perhaps the most curious effect of the mushroom, and by this I mean the strongest effect, was the symptoms noticed by the subject on the day following the use of the mushroom. In all cases where a sufficient dose had been given these individuals reported an unusual sensitivity of the gustatory and smell senses. The first thing they noticed was that there was a perpetual bad taste in their mouths. There was nothing that could be done to get rid of this. Secondly, everything seemed to smell unusually foul. It was a though every smell was offensive. ... There was also an urgency to urinate without much issue.

[Puharich 1959]

MUSCARINE

See Muscarinum.

KEY COMPONENTS

Two sides

There are two sides to Agaricus, as the caterpillar in Lewis Carroll's *Alice in Wonderland* sullenly points out. "One side will make you grow taller, and the other side will make you grow smaller." Tall or small, that is what keeps Alice

puzzled for some time after receiving the caterpillars advice. She finds difficulties in "getting back to her right size," shrinking or elongating depending on which side of the mushroom she nibbles. But after setting to work very carefully, "nibbling first at one [piece of the mushroom] and then at the other, and growing sometimes taller and sometimes shorter," she finally succeeds "in bringing herself down to her usual height."

For describing in such detail the disorientating effects of the fly agaric, Lewis Carroll must have drawn inspiration from the contemporary account of fly agaric inebriation by the British mycologist Mordecai Cubitt Cooke. Cooke published his historical study on psychoactive drugs, entitled *The Seven Sisters of Sleep,* in 1860. Two years later, Carroll began to write his surreal *Alice in Wonderland.*

The two sides refer to the property of the fly agaric to provoke either a state of *macropsia* or *micropsia.* Macropsia is the tendency to see objects larger than they actually are, while in micropsia the objects are perceived as diminished in size. It amounts in either case to distorted perception or *inaccurate judgement* of size, distance or situation. In Agaricus this has its physical parallel in *defective accommodation,* defective adjustment of the eye to change of distance. Agaricus, like Alice, has difficulty getting back to the right size.

Macropsia

The commonly presented drug picture of Agaricus is that of macropsia. Among the intoxication symptoms are: "Perception of relative size of objects is lost, takes long steps and jumps over small objects as if they were trunks of trees - a small hole appears as a frightful chasm, a spoonful of water an immense lake." The natural inclinations of the individual become stimulated in an exaggerated way by the fly agaric. Langsdorf, who in 1809 reported on fly agaric use among Siberian tribes, observed "the effects of intoxication in fine detail, recording redness and swelling of faces, with muscles twitching in initial stages, leading to haziness of mind and sleep, or in high doses spasms of limb and hand, or in extremes, actual convulsions."

> The nerves are highly stimulated, and in this state the slightest effort of will produces very powerful effects. Consequently, if one wishes to step over a small stick or straw, he steps and jumps as though the obstacles were tree trunks. If a man is ordinarily talkative, his speech nerves are now in constant activity, and he involuntarily blurts out secrets, fully conscious of his actions and aware of his secret but unable to hold his nerves in check. In this condition a man who is fond of dancing dances and a music lover sings incessantly. Others run or walk quite involuntarily, without any

intention of moving, to places where they do not wish to go at all.
[Cited in Wasson 1968]

Psychologically the erroneous perception translates into the tendency of making a mountain out of a molehill or skin cancer out of a pimple. Trifles are blown out of proportion. Vithoulkas characterizes the Agaricus individual as "dependent, weak-willed, and having from an early age established a pattern of seeking the guidance and domination of a stronger person." The "slightest effort of will produces very powerful effects" contrasts sharply with "weak- willed". The contradiction may result from the fact that there are two sides to Agaricus.
Anxiety about health. "Fear of cancer, but they don't think they are going to die. They are always meeting or hearing of people who have cancer; they like to help dying people." [Vithoulkas] Here we observe a second peculiarity of Agaricus: intense curiosity. They may go from one therapist to the next, trying out all sorts of treatments, which is motivated by an urge to explore rather than a fear of death. Agaricus is out on an exploratory expedition and uses his ailments as an admission ticket. The desire to broaden one's horizon includes a fascination with death and dying.

Micropsia
As the reverse of macropsia, the Agaricus individual in a state of micropsia tends to make a molehill out of a mountain. A frightful chasm appears as a small hole. Since he has no accurate perception of the actual situation, "he runs about in the most dangerous places." Problems are made into trifles, objections brushed aside. Inclined or willing to take risks, he knows no fear, or rather doesn't realize any danger, hence dares more than what might be good for him. Lacking perspective, he sets his goals too high, goes too far, carries too much. That he is accident-prone doesn't change his motto: nothing ventured, nothing gained.
Others may perceive the foolishness of his bold plans or undertakings, but he will be the last to see it. And if he does, then he won't admit it, partly out of sheer stubbornness, partly because he believes in himself, to the extent that he feels empowered by a force greater than himself. He resembles the Siberian shaman who, after ingesting fly agaric, went out into the severe cold to trudge barefooted for hours through the deep snow for the sheer pleasure of conducting exercise with no sense of fatigue.
A German saying explains that the fly agaric makes people do foolish things: "Er hat verriickte Schwammerln gegessen" ["he has eaten crazy mushrooms"].

Increased strength - battle frenzy

The Siberian Koryaks have a legend that tells of the particular power the fly agaric is endowed with.

> Once, so the Koryak relate, Big Raven had caught a whale, and could not send it to its home in the sea. He was unable to lift the grass bag containing travelling-provisions for the whale. Big Raven applied to Existence [Vahinyinin] to help him. The deity said to him, "Go to a level place near the sea: there thou wilt find white soft stalks with spotted hats. These are the spirits wapaq. Eat some of them, and they will help thee." Big Raven went. Then the Supreme Being spat upon the earth, and out of his saliva the agaric appeared. Big Raven found the fungus, ate of it, and began to feel gay. He started to dance. The Fly Agaric said to him, "How is it that thou, being such a strong man, canst not lift the bag?" - "That is right," said Big Raven. "I am a strong man. I shall go and lift the travelling-bag." He went, lifted the bag at once, and sent the whale home. Then the Agaric showed him how the whale was going out to sea, and how he would return to his comrades. Then Big Raven said, "Let the Agaric remain on earth, and let my children see what it will show them." [Ramsbottom 1953]

Following the myth, the Siberians recommended the mushroom for heavy physical labour. The belief that the increased muscular strength resulted in violence, self-destruction and murder was initiated by the botanist Stepan Krasheninnikov who in 1755 published a book about his experiences between 1733 and 1742 as a member of a Russian expedition to the Kamchatka Peninsula in the northeast of Siberia. Krasheninnikovs findings are included in the homeopathic materia medica, as reference 38 in Allens *Encyclopaedia* [misspelled as Krachemariskov]. The anecdotal symptoms provided by him are probably partly inaccurate, if not completely incorrect.

> It is observed, whenever they have eaten of this plant, they maintain that, whatever foolish things they did, they only obeyed the commands of the mushroom: however, the use of it is certainly so dangerous, that unless they were well looked after it would be the destruction of numbers of them. ... Another of the inhabitants of *Kamchatka,* by the use of this mushroom, imagined that he was upon the brink of hell ready to be thrown in, and that the mushroom ordered him to fall upon his knees, and

> make a full confession of all his sins he could remember, which he did before a great number of his comrades, to their no small diversion. ... My interpreter drank some of this juice without knowing of it, and became so mad, that it was with difficulty that we kept him from ripping open his belly, being, as he said, ordered to do it by the mushroom.
>
> The *Kamchadales* and *Koreki* eat of it when they resolve to murder any body. [Cited in Schleiffer 1979]

In 1784 the Swedish theologist and naturalist Samuel Odman, in his youth one of Linnaeus' favourite pupils, used Krasheninnikov's report to bolster his claim that Viking berserkers deliberately ingested fly agaric to put them in a frenzy for battle.

> Of all Swedish plants, however, I consider the fly agaric, Agaricus muscarius, to be the one that really solves the mystery of the Berserkers. Its use is so widespread in Northern Asia that there are hardly any nomadic tribes that do not use it in order to deprive themselves of their feelings and senses that may enjoy the animal pleasure of escaping the salutary bonds of reasons. ... Those who use this mushroom first become merry, so that they sing, shout, etc., then it attacks the functions of the brain and they have the sensation of becoming very big and strong; the frenzy increases and is accompanied by unusual energy and convulsive movements. The sober persons in their company often have to watch them to see that they do no violence to themselves or others.

R. Gordon Wasson challenged this view because it contradicts the experiences of many who ingest the fly agaric and find it sedating.

> The statement about injuring self and others is unjustified. A careful reading of our many exhibits fails to disclose a single case where a Siberian tribesman under the influence of the fly agaric threatened either himself or others with injury. On the contrary, the effect is to calm the subject, to put him into a benign mood. ... Krasheninnikov says that the natives take the fly agaric before going out to kill someone, but he gives no support for this statement. He did not know the native language and he relied largely on Russian informants. His own colleague Steller does not repeat this, and the many later observers who know the country from long experience, some of them professional linguists speaking local languages, fail to confirm it. Krasheninnikov was an astute observer trying to arrive at the facts through

> a screen of questionable informants. He should be admired as a worthy period piece, certainly not quoted as an authority on the fly agaric in 1968. ... As for Odman, why should anyone cite him today?
> [Wasson 1968]

Violence or non-violence

Misrelated or misreported symptoms may put us on the wrong track, let alone what happens if we base our prescriptions on them. Allens presentation of Agaricus symptoms readily gives the impression that this remedy befits persons inclined to outbursts of malicious violence. Obviously it makes quite a difference whether one's increased energy is used to carry a whale back to the sea or to go out on a killing spree. The effects evoked by the fly agaric are often regarded as corresponding with "going berserk" and this in turn with the Vikings, depicted as a brutal bunch of plunderers and coldblooded murderers.

If the Vikings drugged themselves before going into battle it is, symptomatically, much more likely that this was done with such Solanaceae as Atropa belladonna or Datura stramonium than with Amanita muscaria. These plants will have caused the berserkers' insensitivity to pain and irresistible fury, while the fly agaric does give strength but does not remove pain. That increased strength instead of fury or wickedness must be considered the central keynote of Agaricus is demonstrated by Adrian Morgan's "involvements with the mushrooms".

> The strength induced by the fly agaric is real to the user. It may be of use to here recount some of my own involvements with the mushrooms. In the fall of 1981, when I began to take these inquiries seriously, I gathered a number of fly agarics. During the cold winter that followed, I consumed these fungi in various ways. They do affect the mind and body quite intensely, in an experience that can last as long as nine hours. ... The mushrooms induced a strange alternation between states of somnolence and feelings of possessing unlimited energy and strength. Other physiological effects include sweating, flushing, and occasionally a sensation of burning on the insides of the nose.
>
> When the mushroom is eaten in a raw state, the somnolence/activity cycle is more pronounced, creating periods of deep, brief sleep, broken by periods of mental agitation. Raw fungi induce feelings of nausea and belching, and thus do not create the physical confidence felt by eating dried caps. Dried fungi arrest sleep and can keep one awake all night if taken late. The creative faculties, in my case artistic abilities, are in no way diminished by consumption of

> fly agaric. The following day, muscles in the neck and body are tight and painful, as if over-exercised. Another symptom, registered by other individuals, is the production of thoughts so irrational and seemingly irrelevant to matters in hand that they can surprise and even shock.
> [Morgan 1995]

In his frenzy, even a weak man performs incredible feats of strength.

> He feels that his limbs are light and relaxed, and his euphoria becomes more and more ecstatic; he is filled with exceptional self-confidence and imagines himself to be possessed of great agility and tremendous physical strength. He does not rest content with the mere feeling but must at all costs express himself, both physically and mentally. He sings; he starts to dance; his urge to talk becomes uncontrollable, but at the same time is frustrated by the onset of speech disturbances.
> [Schenk 1955]

The Agaricus-individual, unrestrained and in high spirits, means no harm.

> An hour after the ingestion of the mushrooms, twitching and trembling of the limbs is noticeable with a period of good humour and light euphoria, characterized by macropsia, visions of the supernatural and illusions of grandeur. Religious overtones - such as an urge to confess sins - frequently occur. Occasionally, the partaker becomes violent, dashing madly about until, exhausted, he drops into a deep sleep.
> [Schultes 1980]

Adversity changed into triumph

In the short story *The Purple Pileus* [1896] H.G. Wells credits a mushroom with bringing great chances in the life of the main character of the story by "maddening this absurd little man to the pitch of decisive action, and so altering the whole course of his life." The effects of the mushroom that Wells describes are practically identical with those produced by the fly agaric.
Here is the story, as related by the Rolfes in *The Romance of the Fungus World.*

> Our hero, Mr. Coombes, a little harassed and hen-pecked draper, led an unhappy life, being handicapped in his struggling business by a lack of support from his pleasure-loving spouse; while he also suffered greatly, both in pocket and reputation, from his wife's visitors. One

Sunday afternoon, he had vainly protested against the playing of banjo tunes, and

> "the end was, that Mr. Coombes ordered his visitors out of the house and they wouldn't go, and so he said he would go himself,"

which he did, to the accompaniment of the same insulting strains. Now he found himself going along a muddy path under some firs:

> "it was late October, and the ditches and heaps of fir needles were gorgeous with clumps of fungi."

Mr. Coombes was sick of life, and as he communed with himself and thought wildly of drowning, or of other means by which he might escape so intolerable an existence, the purple pileus caught his eye.

> "They were wonderful fellows, these fungi, thought Mr. Coombes, and all of them the deadliest poisons, as his father had often told him."

But having in his desperation consumed one, with the full intent of making away with himself,

> "he was no longer dull - he felt bright, cheerful. And his throat was afire. He laughed in the sudden gaiety of his heart. Had he been dull? He did not know; but at any rate he would be dull no longer. He got up and stood unsteadily, regarding the universe with an agreeable smile. He began to remember. He could not remember very well, because of a steam roundabout that was beginning in his head. And he knew he had been disagreeable at home, just because they wanted to be happy. They were quite right; life should be as gay as possible. He would go home, and make it up, and reassure them. And why not take some of this delightful toadstool with him, for them to eat. A hatful, no less. Some of those red ones with white spots as well, and a few yellow. He had been a dull dog, an enemy to merriment; he would make up for it. It would be gay to turn his coat-sleeves inside out, and stick some yellow gorse into his waistcoat pocket. Then home - singing - for a jolly evening."

But when he arrived, his visitors, very startled by his new appearance - his face

> "was livid white, his eyes were unnaturally large and bright, and his pale blue lips were drawn back in a cheerless grin" —

showing no inclination to partake of the offering of friendship he brought them, he became mad with fury, shouting

> "in such a huge voice as Mrs. Coombes had never heard before ... 'My house. I'm master 'ere. Eat what I give yer!"'

Whereupon the two women fled to safety, the luckless Clarence, now showing himself a coward, remaining in the hands of Mr. Coombes after a similar but futile attempt to escape.

> "Mr. Clarence is singularly reticent of the details of what occurred. It seems that Mr. Coombes' transitory irritation had vanished again and he was once more a genial playfellow. And as there were knives and meat choppers about, Clarence very generously resolved to humour him and to avoid anything tragic. It is beyond dispute that Mr. Coombes played with Mr. Clarence to his heart's content ...
> He insisted gaily on Clarence trying the fungi, and, after a friendly tussle, was smitten with remorse at the mess he was making of his guest's face. It also appears that Clarence was dragged under the sink and his face scrubbed with the blacking brush - he being still resolved to humour the lunatic at all cost - and that finally, in a somewhat dishevelled, chipped, and discoloured condition, he was assisted to his coat and shown out by the back door."

The subsequent proceedings of Mr. Coombes, sufficiently enlivening though they were, are too lengthy to chronicle here, but his evening ended in the coal cellar, in a deep and healing sleep.
And having thus valiantly asserted himself ["Now you know what I'm like when I'm roused," as he told Mrs. Coombes next morning] his wife was changed from a hindrance to a helpmate, and success smiled on him thereafter.

Enterprising
The Scandinavian countries Norway and Sweden abound in pine and birch forests and hence in their symbiotic partners, fly agarics, now and probably even more so in the Viking era, which lasted from roughly 789 to 1100.

To the 6th-century Gothic historian Jordanes, Scandinavia was the "womb of peoples," for the Cimbri and Teutones who invaded the Roman Empire in 113 BC probably originated in Jutland and Germanic peoples like the Goths, Burgundians and Vandals, invading the Roman Empire in the 5th century AD, originally lived in Scandinavia.

The Vikings were fearsome raiders or peaceful traders, with an enormous geographical range of activity, spanning most of their known world and going some way beyond it. Causes for the Viking expansion have been suggested to be land-hunger, advanced nautical technology, competition for power, and commercial spirit.

At any rate, Viking traders and warriors extended the limits of the known world further and further. Their far-flung activity made them sail down the great rivers of Russia to cross the Black Sea and the Caspian Sea, to settle in the British Isles and Normandy ["Northman's Land"], and to push at the limits of the known world by crossing the North Atlantic to settle in the Faeroe Islands, Iceland [both inhabited by Irish monks] and Greenland and to discover North America. Pioneering Swedish Vikings known as the Rus began their eastward expansion as early as the 7[1]*[1] centur y and founded "Rusland" [Russia] or "land of the Swedes". The Rus reached Constantinople in 839.[1]

Norwegian and Danish Vikings explored the West. In 983 Erik the Red succeeded in voyaging more than 800 miles [1287 km.] from Iceland to discover a barren, ice-bound land that he optimistically named Greenland. Leif Eriksson, his son, went even farther: casting off from Greenland, he sailed nearly 2000 miles [3219 km.] to a land he named Vinland, a part of the area now known as North America. The courage of these explorers is commemorated in sagas repeated from generation to generation. "The traditional image of the Vikings as nothing more than axe-yielding pirates bent on rape and pillage or conquest has been balanced by a new appreciation of peaceful Viking enterprise in the fields of trade, crafts, exploration and set-tlement," concludes John Haywood.

Comparing the nature of the Vikings with the "mushroom-spirit" [as described above] raises some intriguing questions. Is there a connection between the enterprising, mushrooming spirit of the Vikings and the fly agaric? Was their urgency to go beyond the limits supported or motivated by the use of Amanita, providing the courage and strength to face the perils of their ventures, or to blunt any sense of danger?

1 John Haywood, The Penguin Historical Atlas of the Vikings; London, 1995.

Sense of danger

Agaricus is present in the rubric "Anxiety about health", but should be added to the rubrics "Presentiment of death" and/or "Delusion one is about to die". Acute awareness of being exposed to danger, or the opposite, being oblivious to danger, take a central place in the drug picture of Agaricus.

> The poisoning victims [who believed they were eating edible mushrooms], on first experiencing subjective effects of *Amanita* inebriation, typically felt they had eaten deadly poisonous mushrooms, and hence were in peril of their lives. One man even phoned his lawyer to make out his will, before calling for medical attention! The worried reactions of friends and relatives confirmed this impression.
> [Ott 1996]

> My sample of people who have eaten the north-eastern variety of *A. muscaria* is very small, three in number, but all of them reported that they became very scared and "felt like they had died."
> [Schaechter 1997]

Death-dreamer

> In the days when the woodlands belonged to the native Peoples, every Ahnishinaabe [Chippewa] child was taught "don't touch" about four things: flaming fire, animals with running sores, Grandfather Rattler, and the *Oshtimisk* [Red Top] *wajashkwedo, Amanita muscaria.* This *Waubwijigan* [White Skull - any of the Destroying Angel or Death Angel mushrooms: Amanita virosa, A. verna, A. muscaria] and the *Jishigagowan* [Vomit Mushroom; possibly Amanita phalloides] possessed plenty *Windigog* [bad spirit]. Should a person even so much as have the juice of these on his hands, we were taught, death might be the result.
>
> Our parents used a forked stick to pull back the soil that we might see the "little skulls" from which they grew. It was small wonder that young children even tiptoed past the places where the death-dreamers showed their heads! All we ever did about the death-dreamers was to leave them stricdy alone; after all, though they were poison to us, they still were the homes of many *manitoansesug* [small animal spirits] to whom they did no harm and gave food and shelter.
>
> Matters were different with Nodjimahkwe. She seemed to have a personal

war on the death-dreamers, especially with *Oshtimisk, Amanita muscaria.* If she and I came upon the *Oshtimissug* on our gathering trips, and the plants were immature or red, she smashed them into the ground with a frightening vehemence. If their bodies were old and dried, she carefully removed them, with sticks, into a birch-bark case attached to her gathering pack.

> "These are the worst of all! - the worst of all!" she would cry. ... Several times I found her hovering over the oven and muttering, "Burn, burn, burn - every bit of you, even your tiny seedlings, ... they shall never spawn again."
>
> ... [The reason for her vehemence] was a wicked sorcerer *Jossakeed*\ who lived in our area. He could throw his voice and make lodges tremble, and do magic tricks, and he fooled many people into paying him good blankets for worthless charms. Among other expensive tastes, the *Jossakeed* [a man who is believed by the community to possess magical powers] had a fondness for women. He never applied to the council to make them his wives, for he never intended to support them, he just took whomever, whenever he wanted; sometimes he had as many as seven at one time.
>
> "However did he get the women to agree to such an arrangement?" I marvelled.
>
> "That was the most wicked thing of all," said Nodjimahkwe. "He would get them to come to him for some charm or other, and then have them drink this decoction he made from the *Oshtimisk.* Whatever was in it, it made them leave everything and everyone else and want to be with him. They said they saw coloured lights and heard beautiful music and had at last found true happiness. They washed that salamander's slimy clothes, and mended his lodge, and cleaned up his filth, and didn't half know what they were doing. ... They lived in a half-world where nothing was real, but they stayed with him because only he could keep them that way." "[Keewaydinoquay Peschel 1998]

Fly-induced activity

Amanita muscaria [from *musca,* a fly] is commonly called Fly Agaric due to its traditional use as a fly-poison. Dried and ground mushrooms were mixed into a bowl of milk and left out to attract flies. Drinking the mixture would stupefy the flies, so that they could be destroyed.

> Wasson offers another explanation for the name. People who have eaten the mushroom exhibit behaviours similar to those of a person or animal

> going crazy from an incessant swarming of mosquitoes or other insects. Such insect-induced insanity was apparently common among the people and animals in the tundra of Europe. Uncontrollable convulsions, violent jerking of the limbs, and a sensation of one's body being overrun by insects were also symptoms of *A. muscaria* intoxication. ... Furthermore, people of the 17th and 18th centuries still believed that mental problems were caused by animals trapped in one's head; thus the phrases "a bee in her bonnet," "a bug in your ear," "bats in your belfry" to indicate some abnormal brain activity. *A. muscaria* intoxication would most assuredly evoke similar commentary. Explanations along these lines that link the mushroom to flies seem to make at least as much sense as its purported insecticidal properties.
> [Hudler 1998]

The fly spells insanity. When treated for fly-infested insanity the patient was considered cured when a fly emerged from his nose.
Flies are usually associated with evil gods and corruption.

"As flies to wanton boys, are we to the gods;
They kill us for their sport. " King Lear. Wm. Shakespeare. Ed.

They can represent supernatural power, mostly evil, and demons are often portrayed as flies. The Phoenician deity Beelzebub, Lord of the Flies or Prince of Demons, is the agent and power of destruction and putrefaction. To the Ancient Greeks flies were sacred creatures, however, and both Zeus and Apollo bore names which related to flies.
On the other hand flies symbolize either a ceaseless quest or they represent "pseudo men-of-action, feverishly busy, useless and importunate like the fly in the fable of the Fly and the Coach, which demanded its wages after having merely watched the others work." [Chevalier & Gheerbrant]

Mutual benefit

Amanita's live in a close *mutually* beneficial relationship with certain trees. Human symbiosis implicates a psychological and/or sexual partnership. Coition, as the word implies, means "going together" [from *co,* together, and *ire, itum,* to go] and should be beneficial for both partners.
Agaricus has about twice as many symptoms related to coition as Calcarea carbonica, Sepia, Staphisagria and Digitalis have. Problems after sexual intercourse may lie predominantly on the physical level [exertion], as with Calcarea and Digitalis, or on the emotional level, as with Sepia and Staphisagria.

In Agaricus it is a combination, resulting in the following symptoms:

During coition:

Palpitation of heart.
Burning in urethra.
Pain in lumbar/sacral regions.

After coition:

Irritability, sadness, unconsciousness.
Chorea, convulsions [in females].
Faintness, lassitude, weakness, weariness.
Sleepiness.
Anorexia.
Trembling [extremities].
Perspiration [profuse and/or at night], general or local [abdomen, chest, upper limbs, shoulders].
Headache [occipital].
Sensation of tension in eyes.
Backache [lumbar/ sacral].
Burning and itching, general or local [extremities].
Weakness of thighs and/or knees.
Itching in vagina.

Amanita muscaria

AGARICUS PANTHERINUS **Agar-pa.**

Scientific name Amanita pantherina (DC: Fr.)Krombh. 1836.
Synonym Agaricus pantherinus DC. 1815.
Common names Panther Cap. The Panther.
Family Amanitaceae.

KEYS

- Mutualistic [symbiotic].
- Loss of coordination and muscular twitching stronger than in Amanita muscaria.
- Twilight zone between thinking and dreaming.
- Fearless. Feeling of going to die but unafraid.
- Unresponsive to pain.
- Lethargy alternating with periods of manic behaviour.
- Compulsive repetition of risky behaviour.
- Disorientation.
- Ataxia.

FEATURES

- Cap brownish to dull yellowish; viscid when moist.
- Cap often darker at centre and paler toward margin.
- Cap with white to pale buff warts [universal veil fragments], may be washed off by rain.
- White flesh, gills, stem and spores.
- Solitary to scattered or densely gregarious on ground in woods.
- Widely distributed. Spring to autumn.
- Mycorrhizal symbionts: pine, spruce, Douglas-fir, oak, beech, birch.
- Prefers sandy soils, but occurs also on basic soils.

AMANITAS CONTAINING IBOTENIC ACID/ MUSCIMOL

- Both compounds have been isolated from Amanita muscaria, A. pantherina, and A. gemmata, and outside this group, ibotenic acid has been found in the Japanese species Tricholoma muscarium. [Amanita gemmata has no homeopathic materia medica, although its effects most likely have been attributed to Agaricus procerus, syn. Lepiota procera; *see.]*

In human volunteers, effects were measurable about 1 hour after ingestion of 7.5 to 10 mg of muscimol or 50 to 90 mg ibotenic acid and continued 3 to 4 hours, with some residual effects as much as 10 hours later, and, in some subjects, a "hangover" the next day. Subjects slow down in performing tasks and appear tired. Muscle spasms in the extremities are observed. Stomach upset and vomiting are common. There is no significant change in pulse rate or blood pressure. Subjective changes of state are frequent but, while some individuals are more relaxed, others are tenser. *Viewing oneselffrom outside one's own body and a sense of being freed from the effects of gravity* are common experiences in both voluntary and accidental intoxications. Near objects frequently appear more remote to the victim; the individual has trouble maintaining a grasp on objects in the hand and believes without particular discomfort that he or she is about to die. [Spoerke & Rumack 1994; my italics]

CLINICAL MANIFESTATIONS

• Similar to those of Amanita muscaria *[see* Agaricus].

However, in general, the concentrations of toxins are higher in *A. pantherina* than in *A. muscaria.* Consequently, the symptoms of A. pantherina are more severe than those of A. muscaria.

Haard & Haard [1975] claim that "in Germany, where such poisonings are frequent, death rates of 5.5% and 1.54% are known for *A. muscaria* and *A. pantherina* respectively"; an unfounded statement partly refuted on the same page [p. 100] with the remark, "actually, documented deaths from *A. muscaria* are rare or non-existent." Although no evidence is provided, Haard & Haard maintain, "Deaths from *A. pantherina* are known, both in the United States and Europe," and then proceed by saying that "eating these mushrooms is akin to befriending a wolverine. There are times when it will let you stroke its soft fur and purr in return, but on another occasion it will run chattering teeth up and down your arm before you have a chance to scream."

The following symptoms, extracted from case reports of Amanita pantherina poisoning, give an idea what befriending a wolverine may include:

- Tingling of the extremities.
- Drowsiness, from which the patient can be easily awakened.
- Dizziness with inability to focus the eyes.
- Semiconscious state; feeling of going to die but unafraid.
- Very disoriented and only able to follow simple commands.

• "Inability to grasp and remember the minor details of everyday life" [persisting for 6 weeks in 4 patients after A. pantherina poisoning].
[Spoerke & Rumack 1994]

• "The patient experiences a feeling of intoxication which is soon followed by nausea and vomiting; subsequently paresthesias develop, which are followed by restlessness, tremors, and rhythmic twitchings, which may later pass into convulsions. The patient may suffer from hallucinations and finally become stuporous and comatose, which condition may last for six to eight hours or more. The urine may contain albumin, urobilin, urobilinogen, and a few red blood cells." [von Oettingen]

• In 13 poisoning cases, involving 6 humans, 6 dogs and 1 cat, these symptoms were recorded.[1]

- Ataxia 10 of 13 cases.
- Muscle spasms 6/13.
- Disorientation 5/13.

Perhaps useful in Alzheimer's disease.

- Vision disturbed [blurred, colours, diplopia, blindness] 5/13.
- Hallucinations 3/13.
- Aggression 3/13.
- Hyperactivity 2/13. [Most of the canine patients showed dizziness and hyperactivity.]
- Lethargy 2/13.
- Hypersensitivity to sound 2/13.
- Mydriasis 2/13.
- Fear of dying 1/13.
- Euphoria 1/13.
- Analgesia 1/13.
- Deep sleep 1/13.
- Intoxicated feeling 1/13.
- Physicals [each 1/13]: dizziness; pain in arm and chest; vomiting; tremors; panting; flatulence; slurred speech.

Included are the symptoms occurring in two adults, a woman and her son, who cooked and ate six specimens, the son eating the largest quantity.

> When presenting to an ER, the son responded to only deep pain. When he was eventually aroused, he reported that he could not see, had a wild

look, was ataxic, belligerent and was striking out at his mother. There were muscle spasms, disorientation, and vomiting. The son later described his experience as a "nightmare - the worst experience ever", in which he had seen lots of colours. The patient reported he had lain down to sleep and was reading a book. He had read three or four chapters, then thought he had fallen asleep, but he said he realized he was not sleeping and did not sleep all night [which included the time when he was completely unresponsive in the ER]. The mother reported no symptoms until her son was under control, when she then became dizzy, disoriented, unsteady and felt drunk ["everything was going around in circles"]. She had muscle spasms and complained of pain in her chest and arm. She reported that she felt like she had a 200 pound weight on her chest. After observation, they both eventually recovered.

1 1997 Annual Report of the North American Mycological Association's Mushroom Poisoning Case Registry.

IBOTENIC ACID/ MUSCIMOL

Ibotenic acid is converted by the human body into the 5-10 times more potent psychotropic substance muscimol. Because ibotenic acid degrades to muscimol on drying, dried Amanitas have been found to be much more potent. The effects depend on both internal [idiosyncrasies, metabolism] and external factors [dosage, seasonal and geographic differences in concentrations of toxins, mode of preparation].

Amanita muscaria and Amanita pantherina are responsible for most cases of ibotenic/muscimol-containing mushroom poisoning. Waser's self-experiments with ibotenic acid and muscimol exhibit a marked similarity with the drug picture of Agaricus, e.g. Waser's sensation that he had lost his legs and the Agaricus-delusion that her "legs don't belong to her"! I have included this experiment here because it offers some more clues than Allen's Encyclopaedia. It would, however, not have been out of place under Agaricus either.

> A 20 mg ibotenic acid dose ingested in water tastes like mushrooms, but produces little immediate action. Within half an hour a warm and slighdy flushed face was noticed, without changes in blood pressure or heart rate, with no physic stimulation, but lassitude followed by sleep. A day later a migraine with classical one-sided visual disturbance developed for the first time in my life. The occipitally localized headache continued in a milder

form for two weeks.

Next I turned to muscimol. A dose of 5 mg in water orally ingested had little effect except a feeling of laziness. Ten mg. produced a slight intoxication after 90 minutes with dizziness, ataxia and elevated mood, psychic stimulation [in psychological tests], no hallucinations but slight changes in taste and colour vision. Some myoclonic muscle twitching followed, and then sleep with dreams. After two to three hours I felt normal, rested and able to undertake anything, even work. During the next night I slept well, deep and long. No other signs followed.

With 15 mg of muscimol administered orally the intoxication started after 40 minutes and was more pronounced. Dizziness made walking with closed eyes impossible, but reflexes were not changed. Speech was sometimes inarticulate and dysarthric. Appetite and taste were diminished. After a phase of stimulation, concentration became more difficult. Vision was altered by endlessly repeated echopictures of situations a few minutes before. Hearing became noisy and sometimes was followed by echo.

Most disturbing were repeated myoclonic cramps of different muscle groups. I felt sometimes as if I had lost my legs, but never had hallucinations as vivid and colourful as with LSD. The pupils remained always the same size. After 2 hours I fell asleep, but I cannot remember any dreams. Two hours later I awoke again and was glad that the muscle twitching was less frequent. I did not feel relaxed and fresh as after 10 mg muscimol but rather dull and uncertain. Blood pressure was only a little elevated during the psychoactive phase.

[In: Efron 1967]

EXPERIMENT

Jonathan Ott published in 1976 the results of a "survey of intentional *versus* accidental use of *A. muscaria* and *A. pantherina* in Washington state" in the *Journal of Psychedelic Drugs* issue 8[i]. Experiments with Amanita pantherina evoked the following symptoms.

"In the spring of 1975, after completing the above survey, I collected some early specimens of A. pantherina near Tenino, Washington. I sliced and sauteed the mushrooms, and divided them into six portions, consisting of about one half cup of material each. The six portions were ingested by myself and five friends, one of whom ingested only half of a dose, the remaining half being ingested, along with a full portion, by another of my

friends. All of us enjoyed the taste of the mushrooms.

After an hour had elapsed, I had concluded that the dosage level was too low, and had retired to my home to build a fire and study. About 90 minutes after ingestion, however, while hyperventilating into my wood stove in an attempt to start the fire, I noticed that I was experiencing changes in visual perception. These effects became stronger over the next hour or so, and were characterized by sensing an 'alive quality' in inanimate objects, wavy motion in the visual field like a Van Gogh canvas [no colour perception was associated with the motion, however, as is so commonly encountered following ingestion of LSD, psilocybin, or mescaline], and mild distortion of size, distance and depth perception. Auditory hallucinations were also prominent - especially the effect, called 'anahata sounds' of yoga, of hearing fine high-pitched sounds like bells and violin strings.

I experienced only slight impairment of motor coordination and balance, such as would be produced by a small amount of ethanol, equivalent to two or three bottles of beer. In contrast to the effect of ethanol, however, there was no slurring of speech or clouding of consciousness. While I felt as though my consciousness was somehow removed and distant from the surroundings, I experienced a sense of great clarity, as I often experience following ingestion of psilocybin-containing mushrooms. It seemed to me that the psychic effect were emanating from the 'ajna chakra', the so-called 'third eye' — a locus above and between the eyes. I experienced no muscular spasms, cramps, vomiting, or nausea of any kind. The experience was totally pleasurable, and lasted about seven hours. I was struck by the unique quality of the effect whereas I find the psychic effects of LSD, psilocybin-containing mushrooms, and peyote to be similar, to be, as it were, on a continuum of related experience, I felt the A. pantherina was distinctly different.

Of my five friends, two experienced slight nausea, and only one felt drowsy. This person slept for about an hour, and awoke feeling refreshed. Two of my friends alleged that they had never been so high on hallucinogenic drugs before. One of these friends, the person who ingested half again as much of the fried mushrooms as I, experienced a complete dissociative reaction, and was unable to communicate with the rest of the group for about five hours. While in this state, he was periodically attempting to articulate his thoughts, but was totally incapable of communication. During this phase of his intoxication, we were talking about this history of A. muscaria and

urine ingestion in Siberia. The subject in the dissociated state later reported the experience of vivid waking dreams, which were related, through bizarre imagery, to the topics of the conversations we had been conducting around him. After about five hours of dissociative experience, the subject began to re-establish contact with the rest of us and within 90 minutes was fully rational, though shaken and frightened. None of us experienced any aftereffects.

Mutualistic [symbiotic].
Loss of coordination and muscular twitching stronger than in Amanita muscaria.
Twilight zone between thinking and dreaming.
Fearless. Feeling of going to die but unafraid.
Unresponsive to pain.
Lethargy alternating with periods of manic behaviour.
Compulsive repetition of risky behaviour.
Disorientation.
Ataxia.

• "Some victims have characterized the intoxicated state [induced by Amanita pantherina or A. muscaria] as a twilight zone between thinking and dreaming, or between wakefulness and light dozing." [Benjamin]

[UN]REALITY

Both Amanita muscaria and Amanita pantherina produce an impairment of judgement as to the reality or unreality of one's perceptions, resulting in the undertaking of dangerous things in some sort of delirious state. A first-hand account of a man experimenting with A. pantherina attests to this. His first trial, with a medium-sized specimen, produced a "dreamy" trip, his second, with twice as much, a trip to the hospital.

> [With the second trial]. The dreamy state came on faster and was more intense. After an hour I tried to get up but felt very confused and disoriented. I didn't know whether I was dreaming or awake or what was real. It wasn't scary, just strange.
>
> I crawled out on a big fallen tree over a pond, and while trying to find a good position, fell off. Then I wasn't sure if it had happened or not, so I got back up on the tree and fell off again. I kept having a compulsion to repeat the fall, because I couldn't tell if it had happened or was going to happen. On about the seventh time, I hit my head on some rocks and was bleeding pretty badly. Some people saw me and got scared. I guess I looked bad, although I was unaware of being hurt. They drove me an hour to the nearest emergency hospital. By the time I got there I thought I had died and gone to heaven. I thought the doctors and nurses were angels and started singing hymns. They did not know what to make of me.
>
> [Cited in Weil & Rosen 1998]

MATERIA MEDICA

Based on one or two poisoning cases [Allen].

= Delirium. Maniacal disposition to rave. Loss of memory. State of consciousness resembling coma. The answers were monosyllabic, with an expression of annoyance.
» Vertigo.
= Great heaviness of the head. Heat in the head.
= Eyes partly open. Conjunctiva injected.
== Face congested.
= Lips tremble. Violent convulsive twitching of the muscles of the face and extremities.
= Difficult deglutition.
= Some loss of appetite.
= Slight diarrhoea.
= Respiration stertorous and irregular; after a few deep inspirations the respirations became weaker and weaker, until at last they ceased entirely for about a quarter of a minute, when there were again deep inspirations.
=> Trembling of the hands.
= General overpowering sense of fatigue. Extreme lassitude and torpor. Loss of power of co-ordinating muscular movements. Convulsive movements. Restless tossing about.
<- On the next day after his consciousness had returned, and he was feeling pretty well, he tried to rise, but fell down in the most violent general spasms, followed by gradual return of consciousness.
= Invincible drowsiness. Stupor. During sleep, respiration embarrassed; face congested and of a livid hue; pulse rather slow.

Some of the above symptoms come from a poisoning case recorded in 1842.

> A singular form of the narcotic effects of the Fungi occurred in the case of a boy of fourteen, who had eaten the *Agaricus pantherinus* near Bologna. In the course of two hours he was seized with delirium, a maniacal disposition to rove, and some convulsive movements. Ere long these symptoms were succeeded by a state resembling coma in every way, except that he looked as if he understood what was going on, and in point of fact really did so. He recovered speedily under the use of emetics.
> [Christison 1855]

Note: Allen mentions “maniacal disposition to rave” [to talk as if mad or delirious], whilst Christison speaks of “maniacal disposition to rove” [to wander about].

Amanita pantherina

AGARICUS PHALLOIDES **Agar-ph.**

Scientific name	Amanita phalloides (Ft.: Fr.) Link 1833.
Synonym	Agaricus phalloides Fr. 1821.
Common name	Death Cap.
Family	Amanitaceae.

KEYS

- Mutualistic [symbiotic].
- Avoids colder localities.
- Smell of raw potatoes or chlorine.
- Gastric type or cerebral type of poisoning.
- Period of relative well-being followed by drama of organ failure.
- Inability to express feelings by words.
- Severe gastrointestinal cramps.
- Marked chilliness.
- Unquenchable thirst.

FEATURES

- Cap yellowish-green to brownish-olive, often fading in age; darkest at centre.
- Cap covered over with a pellicle which is viscid [not glutinous] in wet weather, often shiny when dry or with a metallic lustre.
- No warts; sometimes one or more patches of thin, silky, white universal veil tissue.
- White flesh, gills, stem and spores.
- Solitary, scattered or in groups in woods or on lawns near trees.
- Widely distributed. Summer to autumn, appearing after first summer rains.
- Mycorrhizal symbionts: deciduous trees, chiefly oak, but also hornbeam and beech.
- Prefers rich soils. Avoids colder localities [absent from mountain ranges].
- Odour “at first mild, but later quite pungent or nauseating [like raw potatoes or chlorine]” []. Baier compares the odour of the ageing mushroom with the “potent sweetish smell of rotting flowers or maturing cheese.”

CLINICAL MANIFESTATIONS

- Deemed the most poisonous of all fungi.

- *See* Agaricus vernus [Amanita verna] for general poisoning features.

> Classic amatoxin poisoning is a triphasic illness, with the first gastrointestinal phase being followed by a period of relative well-being - sometimes called the "honeymoon" period - before the terminal drama of organ failure is played out. The initial symptoms of amatoxin poisoning constitute a rather non-specific gastrointestinal syndrome characterized by the sudden onset of cramping abdominal pain, vomiting, and watery diarrhoea, which is frequently described as "cholera like." The diarrhoeal stool may contain flecks of mucus and blood. ...
>
> Abdominal symptoms usually recur by 72 hours post ingestion and are accompanied by evidence of hepatic dysfunction and the onset of jaundice. The liver is enlarged and tender to palpation. Hypoglycaemia may be seen. ... In patients whose liver necrosis progresses rapidly, the ensuing coagulopathy may be associated with significant gastrointestinal haemorrhage. Patients with the most severe intoxication progress to acute hepatic failure, with all the expected signs and symptoms. Hepatic encephalopathy develops, with confusion, delirium, convulsions, meningeal signs, and progressive coma.
>
> ...Cardiac manifestations, due both to metabolic disturbances and to direct effects of amatoxin, have been described in patients who survived the organ failures. Abnormalities in rhythm or conduction may last a month or more after the patient has recovered. ...
>
> [In four patients] marked abnormalities were found in the levels of hormones regulating glucose, calcium, and the thyroid gland. ... The thyroxine level was decreased in all patients.
>
> [Benjamin 1995]

• Nine poisoning cases in the USA in 1997 resulted in:

- Vomiting and diarrhoea 8 of 9 cases.
- Nausea and intestinal cramps 7/9.
- Dizziness 2/9.
- Drowsiness 2/9.

- Weakness 2/9.
- Liver damage 2/9.
- Death 1/9.

• "Some patients may show a considerable leukocytosis, a shift to the left, and lymphocytopenia." [von Oettingen]
• "Amanitine is a polypeptide containing an indol group and forming about 60% of Amanita-toxin. It is slow in action, causing hypoglycaemia and karyolysis [dissolution of cell nucleus], being responsible for the principal symptoms. The least trace inflamed the eyes of the investigators and caused running eczematous slowly-healing sores on the skin." [Ramsbottom]

TWO TYPES

The German toxicologist Louis Lewin distinguished two types of Amanita phalloides poisoning. The *gastric* type includes vomiting, diarrhoea, colic pains, thirst, lassitude, collapse, livid discolouration of the lips, cold sweat, occasionally blood or bile in faeces or anuria.
The *cerebral* type is characterised by headache; somnolence; cramps in calves; trismus; opisthotonos; contraction of arm muscles; spasmodic twisting body-movements; quick turning movements of the head from left to right; jerking outward of the left arm and drawing up in jerks of the left leg; vertigo; moaning; anguish; cri encephalique; mydriasis and blindness. In two lethal poisoning cases the victims spasmodically twisted their bodies lengthwise from left to right. [Lewin 1928]

POISONING CASES

Christison relates a set of poisoning cases, caused by "a small conical fungus of a mouse colour" [one of the extremely toxic Conocybe or Galerina species?], which have all the characteristics of the typical amatoxin poisoning.

> This species seems to cause convulsions as well as sopor. A family of six persons, four of whom were children, ate about two pounds of it dressed with butter. The incipient symptoms were pain in the pit of the stomach, a sense of impending suffocation, and violent efforts to vomit; which symptoms did not commence in any of them till about twelve hours after the poisonous meal, in one not till twenty hours, and in another not till

nearly thirty hours.

One of the children, seven years of age, had acute pain of the belly, which soon swelled enormously; afterwards he fell into a state of lethargic sleep, but continued to cry; about twenty-four hours after eating the fungi the limbs became affected with permanent spasms and convulsive fits; and in no long time he expired in a tetanic paroxysm. Another of the children, ten years old, perished nearly in the same manner, but with convulsions of greater violence.

The mother had frequent bloody stools and vomiting; the skin became yellow; the muscles of the abdomen were contracted spasmodically, so that the navel was drawn towards the spine; profound lethargy and general coldness supervened; and she too died about thirty-six hours after eating the fungus. A third child, after slight symptoms of amendment had shown themselves, became worse again, and died on the third day with trembling, delirium, and convulsions.

This patient, who had taken very little of the poison, was not attacked till about thirty hours after the meal. The fourth child, after precursory symptoms like those of the rest, became delirious, and had an attack of colic and inflammation of the bowels, without diarrhoea; but he eventually recovered. The father had a severe attack of dysentery for three days, and remained five days speechless. For a long time afterwards he had occasional bloody diarrhoea; and, although he eventually recovered, his health continued to suffer for an entire year.

[Christison 1855]

Mutualistic [symbiotic].
Avoids colder localities.
Smell of raw potatoes or chlorine.
Gastric type or cerebral type of poisoning.
Period of relative well-being followed by drama of organ failure.
Inability to express feelings by words.
Severe gastrointestinal cramps.
Marked chilliness.
Unquenchable thirst.

MATERIA MEDICA

Based on poisoning cases; see for recent proving Addendum page 715

"Symptoms observed in poisoning cases give a complete picture of Asiatic cholera." [Clarke]

Mind

Excitement [lasting for three days after ingestion of mushrooms].

Delirium, with faint, indistinct dreams.

[Pain-caused] restlessness, tossing about in bed.

Assumes strange attitudes and positions [from pain]. Staggers as if intoxicated, and, with odd gesticulations, labours to express his sufferings, but cannot

articulate a syllable.
Aversion to lying down; resdessness and impatience lead him to make frequent attempts to walk about, but without any fixed object or design.
Anxious facial expression.

Speech
Speechless; unable to express feelings by words.
Stammering.
Indistinct.
Slow. Answers slowly.

Pains
Severe cramps.
Incessant cramps in stomach/ abdomen, forcing cries from the patient.
Violent cramps in legs, feet, and calves.
Violent pains in epigastrium, which spread rapidly over the whole abdomen; greatly < pressure.
Spasmodic constrictive pain in abdomen, extending into lower extremities, after stool.
Frightful headache.
Unendurable pains in hypogastrium and lumbar region.

Temperature
Marked chilliness.
Cold sweat.
Cold tongue.
Cold extremities.
Skin cold, afterwards hot.

Discolorations
Face pale [deathlike], red or cyanotic.
Teeth and gums black.
Tongue red, dry.
Upper extremities swell and assume a livid colour.
Lower extremities bluish.
Fingertips livid.
Skin livid. Body covered with livid spots.

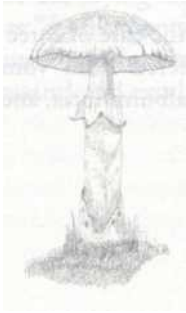
Energy
Debility. Extreme prostration. Great exhaustion.

Dryness
Dryness of nose, mouth, tongue, throat.
Skin of extremities lost their elasticity.

Thirst
Intense thirst for cold water.
Violent thirst, but vomiting of all liquids.
"The patient's thirst cannot be quenched, for any intake of fluid immediately causes renewed vomiting." [Schenk]

Excretions
Very frequent mucous and bilious vomiting.
Vomiting of blood.
Stools: frequent, bilious; whitish as in Asiatic cholera; frequent, watery; bloody; black, involuntary.
Suppression of urine.

Particulars
Violent pains in joints, especially of the ankles, < movement.
Sharp changes from rapid to slow and from slow to rapid breathing. [Boericke]
Cutaneous sensibility decidedly diminished, especially over the chest, abdomen, thighs, and arms.
Pupils irregularly and considerably contracted, the left forming a mere black central point, the right being a little larger; both were insensible to light. Meteorism.
Abdomen hard and tense.
Arrhythmia following choleriform gastrointestinal upset.



Amanita phalloides

AGARICUS RUBESCENS **Agar-r.**

Scientific name	Amanita rubescens Pers. 1797.
Common names	Blushing Amanita. Blusher.
Family	Amanitaceae.

KEYS

- Mutualistic [symbiotic].
- The blusher; stains red when bruised.
- Anaemia.
- Disturbance of sensory functions.

FEATURES

- Cap pinkish-brown to flesh-coloured..
- Cap moist but not glutinous in rainy weather and opaque when dry.
- Cap covered with whitish, pinkish to brownish, unequal, soft, mealy, easily-separating warts, which are smaller, harder and more closely adherent in dry weather.
- White flesh, gills, stem and spores.
- Stains dingy reddish to wine-red when bruised [Blusher]; in dry weather the flesh reddens more slowly.
- Solitary, scattered or in large patches in [oak] woods and under trees.
- Widely distributed. Spring to autumn.
- Mycorrhizal symbionts: conifers and hardwoods [mainly oak].

CLINICAL MANIFESTATIONS

Mutualistic [symbiotic].
The blusher; stains red when bruised.
Anaemia.
Disturbance of sensory functions.

- Unlike many Amanita species, the blusher is edible if well cooked. Causes anaemia if eaten raw. [The Blusher contains small amounts of amatoxins.]
- Blyth [1885] relates briefly the case of three labourers who, after eating the fungus, suffered from vomiting, thirst, a “drunken” condition, cramp, albuminuria, and disturbance of the sensory functions.

AGARICUS VERNUS **Agar-v.**

Scientific name	Amanita verna (Bull. Fr.) Lam. 1783.
Synonym	Agaricus vernus Bull. 1782.
Common names	Spring Destroying Angel. Fool's Mushroom. Fool's Angel.
Family	Amanitaceae.

KEYS

- Mutualistic [symbiotic].
- Fool's Angel. Destroying Angel.
- Death masquerading as a virgin bride.
- Pain-caused restlessness.
- Remission and return of symptoms.
- Rapid loss of strength and weight.
- Similarity with strychnine poisoning.

FEATURES

- Cap all white with a silky lustre, viscid when moist, no warts.
- White flesh, cap, gills, stem, spores, ring and volva.
- Solitary, scattered or in small groups in mixed woods or in grass near trees.
- Widely distributed.
- Usually appears in the spring, as the name implies [vern- means spring], but in the United States, although not likely to be abundant, "in a given wooded area, usually about the middle of August, one may find dozens of specimens of A. verna," according to Christensen.
- Mycorrhizal symbionts: warm chestnut and mixed oak forests.
- Three closely related, deadly poisonous, pristine-white "veiled threats" are also known commonly as "Destroying Angels": Amanita virosa, A. bisporig- era, A. ocreata.
- The pure white destroying angels, so stately and resplendent, have been aptly described as "death masquerading as a virgin bride."
- Entices the mushroom hunter with its appearance, pleasant smell [later becoming unpleasant] and excellent taste.

CLINICAL MANIFESTATIONS

- Contains the same toxins as Amanita phalloides *[see].*

- Sudden, severe seizures of abdominal pain; nausea, persistent vomiting and watery diarrhoea, followed by extreme abdominal pain, excessive thirst, urinary problems [anuria], jaundice, convulsions.
- Pain-caused restlessness.
- Remission and return of symptoms is characteristic.
- Exhaustion and muscle cramps [from loss of fluids/ electrolytes].
- Rapid loss of strength and weight.
- Cyanosis and coldness of the skin.
- Liver enlarged and painful on pressure.
- Liver and/or kidney failure.
- Severe dehydration and electrolyte loss may result in massive circulatory collapse and cardiac arrest.

Mutualistic [symbiotic].
ool's Angel. Destroying Angel.
Death masquerading as a virgin bride.
Pain-caused restlessness.
Remission and return of symptoms.
Rapid loss of strength and weight.
Similarity with strychnine poisoning.

The symptoms appear from six to fifteen hours after the ingestion of the poison and may be largely choleraic in nature, *i.e.,* vomiting and purging, the discharges from the bowel being watery with small flakes suspended and sometimes containing blood.

The disturbance of the circulation is somewhat similar to that caused by A. muscaria, viz., slow, strong pulse early, but rapid and weak later. Dizziness and faintness may be early symptoms. Sometimes the skin is pale and covered with cold, clammy sweat; at others there is great cyanosis. The body temperature is subnormal, unless nervous symptoms are very severe. Very prominent among the symptoms are tetanic convulsions, which may comparatively early and persist until the end.

In animals the effect of this toadstool is entirely different from that of Amanita muscaria. Perhaps the most striking difference is the frequency with which convulsions appear. Convulsions appeared repeatedly in mammals and in nearly every frog to which the toadstool was given. This fungus seems to contain some poison that acts upon the spinal cord, very much as strychnine does, though less powerfully, of course.

The circulatory conditions are also different. The inhibition of the heart

may be pronounced as an early condition, but the pressure does not return to the normal after this disappears, either from giving atropine or from cutting the pneumogastric nerves. The cardiac inhibition is much more complete than after poisoning by the A. muscaria. There is often a fall of pressure without cardiac inhibition. In other words, there is a much greater permanent fall of blood pressure due to paralysis of the nerve centre controlling the blood vessels. This condition will last a long time and does not show the same tendency to disappear as after A. muscaria.

> The respirations are very slow. The blood is poorly oxygenated and this probably causes the cyanosis sometimes observed in men poisoned by this fungus.
>
> Bloody fluid is sometimes vomited or comes from the nose. It may also occur in the discharge from the bowel.
>
> Retching and purging occurred more frequently as early symptoms than in animals poisoned by A. muscaria.
>
> Coma appeared early and continued until death.
>
> [Mcllvaine 1973]

Gussow and Odell cite a case where a stew of mixed white mushrooms - Clitocybe, Lactarius or Russula and Amanita verna - had lethal effects. There is no 100% certainty, but a comment by Christensen seems to indicate that Amanita verna was mainly responsible for the effects: “So for a mess of wild mushrooms made up principally of kinds that at best are by no means choice, plus some specimens of *A. verna,* six people experienced the horrible suffering described, four of them died, and a couple of months or more later the two survivors still had not totally recovered.”

> In the early forenoon of Saturday, September 11, 1926, M., a day labourer, aged fifty-five, collected in a thin woodland near London, Ont., three or four quarts of mixed white mushrooms. They were cleaned and stewed in milk with chopped parsley and onions. The parents with two children, John, aged twelve, and Anne, aged seven, had dinner about eleven o’clock and ate a portion of the mushroom stew.
>
> In the mid-afternoon a Polish acquaintance, Stan. S., aged forty-five, called at M.’s home. He learned of the mushroom delicacy they had had for dinner, regretting that he not gone mushroom-collecting with M., and was pleased when he was given a bowl of the stew, which he took away to the home of Joseph S. Between three and four o’clock these two men sat down to enjoy the treat. Joseph S. sampled two or three spoonfuls,

declared they were bitter and that he did not like them and stopped with that. Stan. S. said they were good, that he liked them, and finished his dish. The former assured me himself that he did not swallow more than a good teaspoonful. By 5.00 p.m. Mrs. M. began to feel pain in the region of the stomach, and nausea, succeeded by dizziness and a feeling she described "as if 1 were drunk."

Thereupon she dosed herself heavily with castor oil. Shortly afterwards her husband came into the house feeling "queer." Then Stan. S. called to thank them for the mushrooms, and finding two of them ill assured them that it couldn't be the fault of the mushrooms seeing that he was feeling fine. In the late evening the twelve-year-old boy alarmed the neighbours with the story that his father and mother were dying.

By nine o'clock the two children as well as the parents were very ill. Medical aid arrived. Cramps, particularly in the legs, vomiting, diarrhoea, and other evidences indicated amanitine poisoning to the physicians, and they did the best in the case that medical science knows. The family, including a nursing infant, were removed to the hospital. After the lapse of a like number of hours Stan. S. became similarly ill and was taken to the hospital. Joseph S.'s turn came next, but he remained in his home and was nursed by his family.

The hospital records show, of course, the progress of the poisoning in each case, and the remedial measures and medicaments employed to meet the varying conditions as they developed. Taken altogether they exhibit variation and repetition of the following effects: cramping pains more or less violent, often in the limbs; vomiting, sometimes of greenish liquids; diarrhoea, greenish liquid stools, passing of blood; fierce thirst; local or general severe soreness of the muscles; very rapid, weak, thready pulsation; bluish or greenish jaundice; alternation of drowsiness and delirium; rigidity of the limbs; brief coma. In the tale of medication employed, when and as needed, were stomach-washing, colon-flushing, morphia, spiritus frumenti, atropine, digitalis, hyoscine, and adrenalin.

Annie M., the seven-year-old child, was the first to be relieved by death. In twenty-four hours from the eating of the mushrooms her eyes were becoming starey, her extremities rigid, and her throat unable to swallow. Before the twenty-fourth hour had elapsed her consciousness had ceased; adrenalin failed to whip up the heart to further action. She was dead.

The father, a man of rugged, muscular frame, was next to go. On Monday morning, in his delirium, he got out of bed and as late as four o'clock in the afternoon he was struggling to rise. At 4:20, in the forty-first hour

after the fatal meal, he had ceased to breathe.

Stan. S., an able-bodied and younger man than M., whose mushrooms were eaten four or five hours later, survived him by twelve hours, being a period of two days and fourteen hours from the time he supped the dish. He was delirious and talking wildly when his eyes began to glaze, his limbs stiffened, his face became grey, and his pulse stopped.

Joseph S. who stated to me that he hardly more than well tasted the stew, kept his bed at his home for five days. His acute attacks would seem from the accounts I obtained to have been quite severe, but yet less violent and less frequent than those already referred to. On the fifth day, he had one or two of these attacks, but at four o'clock in the afternoon his family thought he was past the crisis and were hopeful of his recovery. And yet, in less than two hours, with his physician at his bedside fighting for his life, his heart failed.

John M., the boy, suffered experiences similar to those of the others. At eight a.m. on the fourth day he stiffened out, and with head thrown backwards, and eyes starey, he mumbled deliriously through an attack that lasted about five minutes. Revived by stimulants, he vomited some greenish fluid and from that time began to improve without relapse. He left the hospital on the twenty-fifth day, still paralyzed in his legs. With the help of crutches he began to use his legs, gradually recovered their tone, and now at the end of two and a half months is nearly well.

The infant that fed at the breast of the poisoned mother on the first half day showed no toxic effects.

The mother herself, who thinks she ate as much of the stew as any of the others, suffered terrible pains in all her muscles and passed considerable blood, but she seemed to escape the intense severity of the onset endured by those who died. She may have responded more favourably to the medication, or the heavy dosing with castor oil and the early vomiting may have had beneficial effects. She and her son left the hospital the same day. Now in the eleventh week she can still feel the effects of the poisoning in the muscles of her arms and calves.

[Cited in Christensen 1975]

MUSCARINUM **Muscin.**

Muscarine.

KEYS

- Hyper-secretion. Profuse perspiration, salivation and lachrymation.
- Vomiting, increased urination and increased defecation.
- Combination of effects of pilocarpine, nicotine and curare.
- Defective accommodation.

CLINICAL MANIFESTATIONS

Muscarinic mushrooms are known to cause the majority of toxic exposures. A series of 248 incidences of muscarine-containing mushrooms poisonings occurring in southern France between 1973 and 1998 and totalled 483 patients, who presented with the following most frequent symptoms:

- Perspiration [96% of patients].
- Vomiting [70%].
- Diarrhoea [62%].
- Hypotension [36%].
- Abdominal pain [32%].
- Miosis [25%].
- Blurred vision [22%].
- Bradycardia [20%].
- Rhinorrhoea [6%].
- Lachrymation [6%].

[International Programme on Chemical Safety; Poisons Information Monograph G028]

Overview of clinical effects [Arena 1976; Spoerke & Rumack 1994]

Eyes

Lachrymation; pinpoint pupils, blurred vision; teichopsia [temporary blurring of vision, or partial blindness, with the appearance of a multicoloured zigzag of light before the eye, accompanying migraine].

Alimentary canal

Salivation; nausea; vomiting; watery stools; abdominal cramps [tenesmus]; faecal incontinence.

Respiratory
Nasal discharge and congestion; tightness in chest; increased bronchial secretions; cough, dyspnoea [asthmatic wheezing], cyanosis; pulmonary oedema.
Cardiovascular
Bradycardia; reduced blood pressure.
Urinary
Urinary frequency and incontinence; bladder contraction; painful urging.
Skin
Perspiration; vasodilation [flushing of skin]; diaphoresis.

PSL - SLUDGE

Muscarine is thought to be present in Amanita muscaria in too insignificant amounts to produce effects. Yet muscarinic effects are commonly induced by ingestion of Amanita muscaria. Its chief action is the production of typical peripheral stimulation of the parasympathetic system. It provokes the characteristic *pilocarpine* reactions and in addition possesses a nicotine and curare effect. Muscarine poisoning is called the PSL [perspiration, salivation, lachrymation] syndrome or the SLUDGE [salivation, lachrymation, urination, defecation, gastrointestinal distress, emesis] syndrome. Rhinorrhoea and bronchorrhoea can also occur.

American comic-book artist Mike Tolento experienced the following after taking A. muscaria.

> My first experience with Amanita muscaria has managed to scare the fuck out of me. I consumed over ten dried grams in a soup at 11:45 p.m. The first effect was nausea, and then the water-works began to kick in - with a trickle at first, then a torrent. My sweat and saliva glands began to work overtime. By an hour after ingestion my skin was wet to the touch. I was not warm, just very sweaty.
> At about 1:30 a.m. I felt it was imperative that I lie down and close my eyes. I was sleepy, yet still remarkably full of energy - a mental energy that engulfed and flowed through me. I closed my eyes and slept, still sweating and salivating into a bottle. I awakened easily at 2 a.m. in another world. My eyes opened and I sat up in a puddle. I was soaked with bodily fluids and I spilled my collected spit. Then, very suddenly, as if someone

had flipped a switch, my vision blurred. I felt lost somewhere completely beyond the range of human experience. This stuff is definitely hallucinogenic, delirium-inducing, whatever ya wanna call it. The sheer discomfort its use causes is nearly unbearable. Hell yes, we are dealing with a poison here.

So here I am from 2 a.m. to 2:30 a.m., lying in my bed, under the influence of a dynamic and powerful energy emanating from my forehead [third eye?] but I'm too scared to relax and concentrate my thoughts. Was I scared of going insane? Nah, I'm there. Was I scared the night would never end? Nah, not really. I was scared of all my goddamn sweating and spitting. I could absolutely not gain control of my own glands. My spit bottle was filling up quickly and my clothes were stuck to my body. This lack of physical control alarmed me.

My body was in a cold, wet, sticky hell that was keeping my mind from reaching heaven. After experiencing A. muscaria I can understand why some believe it was consumed by the writers of the Bible. This stuff does have the potential to be inspirational in a divine way. I shut off my light and went to sleep, uncontrollably shivering, salivating, and perspiring far from home. But my experience was not over.

I had a dream. My dream was very intense. It felt real. It centred on me, the bad trip I had been having, and [in a round about way] my job. This dreaming state was the most remarkable part of the experience. It was also the most rewarding and pleasurable moment, free as I was in this sleeping state from the horrible side effects.

I had the distinct impression that other people were in my room and that they were hard at work while I slept. What they were working on was very bizarre and abstract. The clearest way 1 can put it is that they were working on A. muscarias effects on me. Each worker seemed real with a distinct personality. Like the various departments at the shitty supermarket in which I worked [dairy, frozen foods, produce, etc.], these people were each confined to a department, the sweat department, the saliva department, the pillow department [don't ask why but one was in charge of my pillow.] I can also remember flashes of little mushroom people running around. They were shaped like tiny little A. muscarias.

Kind of like the 'Goombahs' from Super Mario Brothers except they were happy. It gave me such a warm, satisfying feeling. I felt like I was surrounded by a group of real souls, actual entities that were totally separate, yet still connected to me. My people. I remember opening my eyes, hoping to interact with them only to be alone and soaked in bed in the dark.

So here I am. It's the next day. I'm fine, just really hungry, sore, and a little light-headed. Thankfully, my glands are in order again. All I can say is I was somewhere far away last night and I'm happy to be back. Not sure when or if I'll go away with fly agaric again.
[Cited by Ian Lordon in Soma: Stormcloud Full of Life; SpruceRoots Magazine, December 2001.]

MATERIA MEDICA

Ringer bases the drug picture of Muscarinum on 13 experiments in 1877, on four men with one-third of a grain or more of muscarine given hypodermically. [Allen's Encyclopaedia, Vol. 10 and Hughes & Dake's Cyclopaedia of Drug Pathogenesy, Vol. 1.]

Symptoms

Eyes
Pupils contracted, often considerably; vision unaffected. Lachrymation, amounting in some instances only to suffusion of the eyes, but generally the tears trickled down the face, so that the patient was obliged to wipe the eyes.

Mouth
Salivation occurred in 11 experiments, in 3 slight, in rest free or profuse. It was not so constant as perspiration, the saliva varying in quantity more than the perspiration.

Stomach
Large doses induced vomiting once and once nausea.

Hyper-secretion. Profuse perspiration, salivation and lachrymation. Vomiting, increased urination and increased defecation. Combination of effects of pilocarpine, nicotine and curare. Defective focus

Stool
Inclination to stool [2 instances]. In 4 experiments on the same man it produced a loose stool, one of a green colour, though bowels had been opened naturally a short time before.

Urinary
In 5 experiments patients were obliged to pass urine in 9-15 minutes after injection, and 2 complained of supra-pubic pain.

Respiratory
Frequent hacking cough [in 5 experiments].

Perspiration
Sweating occurred in 11 of the 13 experiments. Half a grain always made it free, whilst large doses rendered it very abundant, comparable to the sweat inducing effects of pilocarpine [active principle of Pilocarpus jaborandi]. Sweat stood in large drops on forehead after large doses, nightdress became soaked and skin felt sodden. In one man only was perspiration absent, salivation taking its place.

= *Muscarine* is very similar to *Pilocarpine* [jaborandi] since both cause arrest of hearts action; profuse sweat; salivation, lachrymation; contracted pupils, etc. *Muscarine* acts more on lachrymal glands, less on sweat and salivary glands; *Pilocarpine* causes more urging to urinate. [Hering]

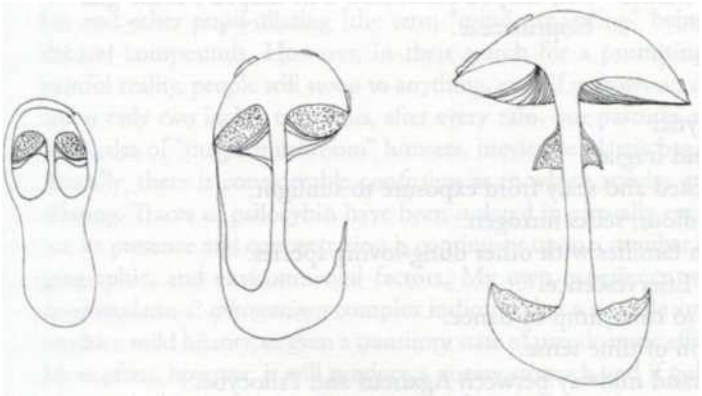
Hughes mentions experiments by Schmiedeberg, who found that 5 mg muscarine produced "miosis, loss of focalising power [defective accommodation], abundant secretion of saliva, determination of blood to head, flushed face, perspiration over whole body, giddiness, anxiety, griping and rumbling in bowels, and weight in head."

= In 1869 Schmiedeberg and Koppe isolated muscarine, which they thought was the essential constituent of Amanita muscaria.

> Muscarine is present in variable but always very small amounts. Its physiological effects are well known - abundant sweating and salivation, augmented intestinal peristalsis, colic, diarrhoea, pupils contracted, miosis, slowing down and finally stopping of the heart - but they are not those of *Amanita muscaria* poisoning. ... Schmiedeberg himself found that the muscarine he isolated would not kill flies, and moreover, realised that it could not be the cause of the observed [Amanita] symptoms. He suspected the presence of another alkaloid [muscaridine]. If muscarine is eliminated the fungus still retains its poisonous properties practically unaltered. These are so similar to those caused by deadly nightshade *[Belladonna,* atropine] that it is assumed to be of the same nature and called mycetoatropine [German: Pilzatropin]. ... The old treatment of administering atropine as an antidote to muscarine aggravates the symptoms. [Ramsbottom 1953]

The muscarine concentration in Amanita muscaria is so low that Kogi and co-workers [1931] used one ton of fresh mushrooms to make the extraction. Because most of the toxin was thought to be in the red cuticle, Kogi's group peeled all the mushrooms in a single night, at the end of which some workers experienced lachrymation and stomach cramps.

Growth stages of Amanita-type fungi



Initially the universal veil encloses the whole fungus, rather like an egg-shell.
Internally, the partial veil covers the gills.
When the universal veil ruptures during growth, it leaves fragments on the cap.
Finally the partial veil ruptures leaving a ring around the sem.

I C. FAMILY COPRINACEAE

Agaricus campanulatus [= Panaeolus campanulatus]
Coprinus atramentarius

AGARICUS CAMPANULATUS **Agar-cpn.**

Scientific name	Panaeolus papilionaceus (Bull: Fr.) Quelet 1872.
Synonyms	Agaricus papilionaceus Bull. 1781. Agaricus campanulatus Fr. 1821. Panaeolus campanulatus (Fr.) Quelet 1872. Panaeolus sphinctrinus (Fr.) Quelet.
Common names	Bell-shaped Panaeolus. Bell-shaped Mottle-gill.
Family	Coprinaceae.

KEYS

- Saprophytic.
- Brittle and fragile.
- Cap cracked and scaly from exposure to sunlight.
- Coprophilous; seeks nitrogen.
- Grows in families with other dung-loving species.
- Hilarity. Effervescence.
- Impulse to run, jump or dance.
- Distortion of time sense.
- Effects stand midway between Agaricus and Psilocybe.

FEATURES

- Cap bell-shaped, scarcely expanding in age.
- Surface of cap often shiny when dry, smooth or finely wrinkled or often cracking to form scales [especially in sunlight]. [Arora]
- Cap some shade of brown when fresh, paler when faded.
- Grey gills; black spores.
- Very brittle and fragile.

• Solitary or in “families” [with other dung-loving species] on or near dung or in grazed or manured grass, especially on horse manure.
• Cosmopolitan. Midsummer to fall [abundant in September and October in Europe].
• Saprophytic.

DUNG

About 175 genera of fungi are largely or exclusively found on dung. Most of these coprophilous [dung-loving] fungi are ascomycetes [Sac Fungi]. Of the basidiomycetes [Club Fungi] the little brown mushrooms [LBM’s such as Psilocybe, Stropharia, Conocybe and Panaeolus spp.] also exploit dung for its high nitrogen content.

> *Panaeolus* is abundant in pastures, lawns, dung, and manure heaps, fruiting whenever it’s moist. It often mixes company with other nondescript “LBM’s” and would rapidly be relegated to the ranks of fungal forgetability were it not for the fact that some of its members contain traces of psilocybin and other pupil-dilating [the term “mind-expanding” being open to debate] compounds. However, in their search for a promising and less painful reality, people will stoop to anything, even if it grows on cow patties and is only two inches tall. Thus, after every rain, our pastures are marred by hordes of “magic mushroom” hunters, inevitable plastic bags in hand. Actually, there is considerable confusion as to which species are pupil— dilating. Traces of psilocybin have been isolated in virtually every species, but its presence and concentration is contingent upon a number of genetic, geographic, and environmental factors. My own experience with the *P. campanulatus-P. sphinctrinus* complex indicates that a sizeable amount *may* produce mild hilarity, or even a transitory state of pseudoerotic effervescence. More often, however, it will produce a queasy stomach and if gulped down too eagerly, hiccups. It hardly seems worth the effort to harvest and digest the necessary number of fungal fructifications [30-50], but some people will do anything to “alter” reality, and it can be argued, I suppose, that doing anything is better than doing nothing. ... A closely-knit group of dung-lovers consists of *P. campanulatus, P. sphinctrinus* and *P. papilionaceus*. Even the experts cannot agree on the exact difference [if any] between them.
> [Arora 1986]

Panaeolus campanulata, P. sphinctrinus and P. papilionaceus are frequently listed as synonyms for each other and only occasionally recognized as distinct species. Differentiation is hampered by the existence of intermediate forms.

CLINICAL MANIFESTATIONS

The various chemicals reported to occur in Panaeolus campanulatus often concern the psychotropic tryptamine derivatives psilocin and psilocybin, and occasionally ibotenic acid/muscimol. The presence of psilocybin places Panaeolus in the group of Psilocybe and Stropharia *[see],* while it will be closer to Amanita muscaria/ Amanita pantherina *[see]* when ibotenic acid/muscimol are the active constituents. Since not much can be derived from the little information in the materia medica it may help to consider Panaeolus as standing in-between Agaricus and Psilocybe. This is supported by the fact that ibotenic acid effects may be distinguished from those of psilocybin by the presence of drowsiness or coma.

No agreement exists about the identity of all magic mushrooms used by Mexican Indians for divination. Panaeolus campanulatus has been brought forward as a candidate.

> *Panaeolus campanulatus ...* was frequendy employed by Mazatec diviners who made a living by using its powers to locate stolen property and give sundry advice to their clients. Diviners who habitually use this kind of mushroom in their work are reported to sometimes suffer from senility and premature ageing as a result of too frequently consulting the fungal oracle. These considerable occupational hazards were probably due to the accumulation of toxins from the mildly poisonous mushrooms. Nevertheless, the fungus was employed as a medicine and its use in the treatment of rheumatism shows a remarkable continuity in ethnomedical practice, as both the ancient Aztecs and the 20th-century Mexican Indians used it as such.
> [Rudgley 1999]

LAUGHING MUSHROOMS

Excessive exhilaration with uncontrollable laughter occurs in the early phases of psilocybin intoxication. The best antidote to uncontrollable laughter, according to the Chinese, is eating earth. Mushrooms that make one laugh are called *wa.raita.ke* in Japan. The *o-waraitake,* or "big laughing mushroom," is the psilocybian Gymnopilus spectabilis and the *waraitake* is Panaeolus campanulatus [or P. papilionaceus]. There is a Japanese *senryu* poem about the waraitake: "It would be nice to make/ The *kunikarol* Eat *waraitake'"* referring to the wish to make the stern *kunikaro,* the feudal lord's straw boss, ingest the "laughing mushrooms" to "lighten up". Sanford relates the story of "Mr. Taniguchi [age 31], Mrs. Taniguchi and Mrs. Taniguchi's brother, Buntsuke [age 41]," who treated themselves to two bowls of laughing mushroom soup, "while the elder Mrs. Taniguchi [age 71] ate one bowl with only two or three mushrooms in it."

> They had hardly eaten when first Mrs. Taniguchi and then Mr. Taniguchi began to feel odd. Mr. Taniguchi then went next door to ask if someone would fetch a doctor. When he got back home he found his wife dancing around stark naked, playing an imaginary shamisen, and laughing raucously. Even as he stood there amazed at all the uproar, he found that he too was falling into the same crazed state. The older brother also eventually began to dance crazily. The intoxication of Taniguchi's mother was weaker, however, and though she became muddled she never lost complete control of her senses. She did, however, keep repeating the same words over and over and went to every house in the neighbourhood apologizing throughout the night for "preparing such a poor meal" and thanking everyone for "putting up with it."
>
> [Sanford, cited by Benjamin 1995]

Symptoms

- Mania; dancing crazily; dancing around naked.
- Laughing raucously [harshly, hoarsely].
- Repeats the same words over and over.

MORE HILARITY

Lincoff and Mitchel relate a poisoning in Maine in which two people ate a pound of *Panaeolus papilionaceus* mushrooms, fried in butter. The case is recounted by one of the victims.

> Peculiar symptoms were perceived in a very short time ... effects seemed entirely mental ... Next, say about half an hour after eating, both of us had an irresistible impulse to run and jump, which we did freely. I did not stagger, but all my motions seemed to be mechanical or automatic, and my muscles did not properly nor fully obey my will. Soon both of us became very hilarious, with an irresistible impulse to laugh and joke immoderately, and almost hysterically at times ... I had no distinct comprehension of time; a very short time seemed long drawn out, and a longer time seemed very short ...
> I noticed that the irregular figures on the wallpaper seemed to have creepy and crawling motions, contracting and expanding continually, though not changing their forms; finally they began to project from the wall and grew out toward me ... then at once the room seemed to become filled with roses of various red colours and of all sizes ... I then had a very disagreeable illusion. Innumerable human faces, of all sorts and sizes, but all hideous, seemed to fill the room and to extend off in multitudes to interminable distances, while many were close to me on all sides.
> They were all grimacing rapidly and horribly and undergoing contortions, all the time growing more and more hideous. Some were upside down. The faces appeared in all sorts of bright and even intense colours - so intense that I could only liken them to flames of fire, in red, purple, green and yellow colours, like fireworks.
> ... I had the unpleasant sensation of having my body elongate upward to the ceiling, which receded. I grew far up, like Jack's beanstalk, but retained my natural thickness. Collapsed suddenly to my natural height ... Probably there was a partial and brief loss of consciousness ... Looking at my hands, they seemed to become small, emaciated, shrunken, and bony, like those of a mummy ... When I attempted to scratch a spot on my neck, it felt like scratching a rough cloth meal-bag full of meal, and it seemed as large as a barrel, and the scratching seemed quite impersonal. Later I imagined I was able, by a sort of clairvoyance, to tell the thoughts of those around me.

> Soon after this our conditions rapidly assumed the very hilarious phase, similar to that of the early stages with much involuntary laughing and joking. This condition gradually diminished ... until our mental conditions became perfecdy normal ... The entire experience lasted about six hours. No ill effects followed. There was no headache, nor any disturbance of the digestion.
> [Cited in Lincoff & Mitchel 1977]

Mcllvaine experimented with this species in the 1890s.

> The effects of P. papilionaceus are very uncertain. I have seen it produce hilarity in a few instances, and other mild symptoms of intoxication, which were soon over, and with little reaction. But I have seen, at table, the same effects from eating preserved peaches and preserved plums that had fermented. Many personal testings have been without effect. Testings upon others vary with the individuals. The fungus seems to contain a mild stimulant. It is not dangerous, but should be eaten with caution. Being of small size, and not a prolific species, quantities of it are difficult to obtain. Moderate quantities of it have no effect whatever.

OUT OF TUNE WITH REALITY

Sanford claims that specimens of *Panaeolus papilionaceus* were gathered and eaten by the thrifty farmers of Maine to give them a free drunk. He also quotes from the above case of a botanist who shared a mess of these mushrooms with the wife of a friend at dinner.

> They were all eaten by Mrs. Y. and myself. Peculiar symptoms were perceived in a very short time. Noticed first that I could not collect my thoughts easily, when addressed, nor answer readily. Could not will to arise prompdy. Walked a short distance; the time was short, but seemed long drawn out; could walk straight but seemed drowsy; remember little about the walk. Mrs. Y. was in about the same condition, according to Mr. Y. My mind very soon appeared to clear up somewhat and things began to seem funny and rather like intoxication. Walked with Mr. Y. A little later objects took on peculiar bright colours. A field of redtop grass seemed to lie in horizontal stripes of bright red and green, and a peculiar green haze spread itself over all the landscape. At this time Mrs. Y. saw nearly everything green but the sky was blue; her white handkerchief

appeared green to her; and the tips of her fingers seemed to be like the heads of snakes.

Saprophytic. Brittle and fragile. Cap cracked and scaly from exposure to sunlight. Coprophilous; seeks nitrogen. Grows in families with other dung-loving species. Hilarity. Effervescence. Impulse to run, jump or dance. Distortion of time sense. Effects stand midway between Agaricus and Psilocybe.

Next, say about half an hour after eating, both of us had an irresistible impulse to run and jump, which we did freely. After entering the house, I noticed that the irregular figures on the wallpaper seemed to have creepy and crawling motions, contracting and expanding continually, though not changing their forms; finally they began to project from the wall and grew out toward me from it with uncanny motions.

I then had a very disagreeable illusion. Innumerable human faces, of all sorts and sizes, but all hideous, seemed to fill the room and to extend off in multitudes to interminable distances, while many were close to me on all sides. They were all grimacing rapidly and horribly and undergoing contortions, all the time growing more and more hideous. Some were upside down.

[Cited in Christensen 1975]

MATERIA MEDICA

"Mr. R.K. Macadam, Boston, Mass., informs me that he has information of a case of poisoning by this fungus," reported Mcllvaine in 1902. "The victim experienced dizziness, dimness of vision, trembling and loss of power and memory. He recovered after simple treatment and was well inside of 24 hours."

The following symptoms come from a case reported by Glen in 1816' and are summarized by Christison.

> The following is a good instance of pure narcotism. A man gathered in Hyde Park a considerable number of the *Agaricus campanulatus* by mistake for the *A. campestris,* stewed them and proceeded to eat them. But before ending his repast, and not above ten minutes after he began it, he was suddenly attacked with dimness of vision, giddiness, debility, trembling, and loss of recollection. In a short time he recovered so far as to be able to go in search of assistance. But he had hardly walked 250 yards when his memory again failed him, and he lost his way. His countenance expressed anxiety, he reeled about, and could hardly articulate. The pulse was slow and feeble. He soon became so drowsy that he could be kept awake only

by constant dragging. Vomiting was then produced by means of sulphate of zinc; the drowsiness gradually went off; and next day he complained merely of languor and weakness.
[Christison 1855]

Symptoms [in Allens Encyclopaedia, based on the above poisoning case].

• Recollection restored, and lost again.
= He loses his way.
= He reels about.
= Sudden dimness of vision.
« Countenance expressive of anxiety.
» He can hardly articulate.
= Pulse slow and feeble.
~ Languor and weakness.
= Giddiness, debility, trembling and loss of memory.
<· Great drowsiness.

1 Glen G. 1816. A case proving the deleterious effects of the Agaricus campanulatus, which was mistaken for the Agaricus campestris, or champignon. London Medical and Physical Journal, Vol. 36:451-453.

COPRINUS ATRAMENTARIUS **Copr-a.**

Scientific name	Coprinus atramentarius (Bull.) Fr. 1838.
Synonym	Agaricus atramentarius Bull. 1783.
Common names	Inky Cap. Tippler's Bane. Alcohol Inky.
Family	Coprinaceae.

KEYS

- Saprophytic.
- Pioneer in disturbed ground.
- Autolysis [self-digestion]; puts on a disappearing act.
- Self-destruction for the purpose of reproduction.
- Very fragile and short-lived, yet pushy and pressing ahead.
- Pops up massively; seizes control; overruns others; monopolizes.
- The soldier among mushrooms. Attila the Hun.
- Intolerance of alcohol. Tipplers Bane.
- Swelling, subjectively and objectively.
- Molybdenum and zinc.

FEATURES

- Cap grey-brown, smooth to silky, conical or campanulate.
- Stem white, dry, hollow.
- Gills greyish white, blackening in age.
- Spores black.
- Cosmopolitan; solitary to clustered or in massive hordes in cultivated [disturbed] areas, around or on rotting wood.
- Spring to fall, massively popping up after rain.
- Saprophytic.

SPECIAL FEATURES

Of the 200 or so known species of Coprinus [name from Gr. *kopros,* dung], the smaller types prefer dung and manure, while the larger ones are at home in urban environments and crop up in disturbed soil, gardens, cellars, dirt parking lots, along roads, etc. Coprinus atramentarius often fruits near buried wood.

Autolysis

All fleshy species of Coprinus undergo self-digestion [autolysis], putting on a "mushroom-disappearing act." The process of self-destruction serves for spore dispersal and characterizes the Coprinus genus. It differs distinctly from the normal decay process in other gilled mushrooms, in which the spores ripen over the whole surface of the gills at the same time. The cap, as the name Inky Cap implies, rapidly becomes converted from below upward into a black liquid, which owes its colour chiefly to the spores it contains. "The process resolves into a beautifully orchestrated sequence. A perfectly timed wave of spore maturation and spore-shooting, followed immediately by a wave of autolysis, sweeps up the gills." [Kendrick] The cap and gills dissolve completely, leaving nothing but a few rags of tissue stuck to the top of the stalk.

Coprinus self-destructs, and melts away, to reproduce.

Fragility

Coprinus species are "so delicate that they emerge in a grassy meadow in the morning only to deliquesce before the sun is full in the sky." [Emboden] The thin delicate cap of some Coprinus species is "very tender, so that a breath destroys it."

Despite their fragility larger Coprinus species can exert a remarkable upward pressure, causing damage by breaking up such surfaces as asphalt or tennis courts as they emerge, often in considerable quantity. "One is reported to have lifted a 10 pound slab of concrete in an heroic attempt to proliferate its species." [Arora]

Ink

The specific name derives from L. *atramentum,* ink, from *ater,* black. "It has been suggested that as the contained spores of different species of Coprinus give a specificity to the ink it should be used for documents where forgery might be attempted. An Australian suggestion is for police to carry 'pistols' containing Indian ink impregnated with the spores of different species. A stain on clothing, made during a melee, would be recognised as of police origin 'fired' by a particular pistol." [Ramsbottom]

Attila the Hun

The autolysis of Coprinus more or less equates with self-effacing behaviour

in humans. Yet there is also a fiercely antagonistic side to Coprinus, giving it a reputation of “the soldier among mushrooms” and “unwanted intruder” [in cultivated mushroom beds]. It is the fungal variety of Attila the Hun, overrunning substrates with its hordes.

> Members of the advanced genus *Coprinus* have weed-like vigour and opportunism, pioneering the exploitations of such habitats as recently disturbed ground and dung. The complex set of physical arrangements and a precisely timed sequence of events during spore liberation makes the genus one of the most advanced of all agarics. ... [The various coprophilous fungi tend to sporulate in a reasonably definite sequence, with species of the genus *Coprinus* being the last to appear.] After a few weeks, almost the only fungi still sporulating on the dung will be species of *Coprinus.*
>
> These can go on producing a sequence of ephemeral basidiomata for months. We now know that the various components of the substrate are far from exhausted after the initial flushes of growth and sporulation. What has really happened is that *Coprinus* has seized control by suppressing most of the other fungi. Hyphae of *Coprinus* are actually extremely antagonistic to those of many other coprophilous fungi. If a *Coprinus* hypha touches one belonging to *Ascobolus,* the *Ascobolus* hypha collapses within minutes.
>
> We don’t understand exactly how this trick is done, but it is extremely effective, and turns out to be a fairly common stratagem among the fungi, whose main competitors for many substrates are other fungi.
>
> Another interesting and important gambit used by *Coprinus* involves repeated anastomoses [communication by cross-connections to form a network]. Spores are more or less evenly dispersed throughout the dung when it is deposited and they all germinate more or less simultaneously, producing small mycelia within the dung.
>
> When compatible mycelia meet, they will anastomose, and soon the entire dung deposit is permeated by what is now essentially a single mycelium, which can then pool its resources and produce more and larger basidiomata. Cooperation pays off for *Coprinus.*
>
> [Kendrick 2000]

CHALLENGING COPRINUS

Coprinus atramentarius is called the *Change-Over Mushroom* by the Chippewa Indians. “If taken along with spirits,” it causes “strange hallucina

tions." To learn the truth about it [meaning that "those heathen superstitions are devilish nonsense"], Keewaydinoquay's grandfather orders to "have crispies [French-fried Coprinus atramentarius] and elderberry wine for dinner."

> [Grandfather] dug the serving fork into the platter of coprinus crispies ... and poured himself half a water glass of elderberry wine. ... [Dinner] was usually fun, but that day it was an unhappy meal. By the time Grandmother stood up to the bring in the dessert, Grandfather Sauganash began to turn red, blue, purple, and white, and made strange growling noises deep in his throat. My mother whisked me upstairs in the bedroom and locked me in. Of course I didn't stay there.
>
> It took me a little while to figure out how to unlock the door. I crept down to the stair landing in my bare feet, and an utterly weird sight met my eyes. Dignified Grandfather Sauganash was dancing on the dinner table, shouting some strange song in a foreign tongue, throwing dinner knives through the window and door panes, and laughing uproariously as they shattered.
>
> ... Mother did what she usually did when there was trouble - ran for father. ... Father hesitated, and while he did so, a gravy boat caught him on the jaw and splattered brown ooze down the front of his only white linen shirt. Once my father decided, it was all over in a split second. Grandfather Sauganash lay on the floor smiling like a baby in his sleep.
>
> ... When Grandfather awoke early the next morning, ... he looked around at us all, and he chuckled. Then he laughed. ... "Ho, ho, ho ... out like a light, eh Margaret? I ask for forgiveness for doubting your word.
>
> I should have known better by this time."
>
> [Keewaydinoquay Peschel 1998]

COOKED OR UNCOOKED

• In I960 German investigators set up an experiment to determine whether or not the Inky Cap needs to be cooked to produce the adverse reaction with alcohol.

> Each of us gathered 250 grams of medium sized mushrooms to eat. Two of the investigators ate the finely chopped mushrooms prepared as a salad; the third consumed them as a cooked mushroom dish. Directly after the meal each drank 100 ml of red wine and after that 40 ml of dry gin. None of the investigators perceived effects associated with the mushrooms.

The investigator who had eaten the cooked mushrooms drank a glass of beer 16 hours after the meal, after which he felt slightly unwell, but to no significant degree. The next day, about 24 hours after the meal he drank a glass of wine. Shortly thereafter followed severe nausea which progressed to vomiting; in addition there was a headache passing to severe cold feeling in the arms and legs. The cold feeling followed a variable course through the night with fever and chills. All symptoms were accompanied with a feeling of great uneasiness. In the morning all complaints were gone.
The two other investigators each drank wine 24 hours after the meal yet felt no reaction. One of us repeated the investigation with raw mushrooms and had the same negative result.
[Cited in: Benjamin 1995]

CLINICAL MANIFESTATIONS

• A method of self-destruction *prevented* by some Coprinus species is alcohol consumption; hence the name Tippler's Bane. Coprinus atramentarius is edible when young, but reacts with alcohol in the body to produce a peculiar set of poisoning symptoms. The mushroom contains the amino acid coprine that is relatively harmless by itself, but will turn nasty when combined with alcohol. Coprine is metabolized in the body to 1-aminocyclopropanol. This metabolite blocks the liver enzyme aldehyde dehydrogenase [ALDH] that catalyzes conversion of acetaldehyde to acetic acid [vinegar], which is then broken down into carbon dioxide and water and excreted from the body. After ingestion of coprine-containing mushrooms, ALDH is inhibited and consumption of ethanol [alcohol] results in acetaldehyde accumulation, a clinical syndrome similar to disulfiram [trade name Antabuse] alcohol reaction. To be effective, ALDH requires the trace elements molybdenum and zinc as co-factors. The activity of disulfiram is due to its ability to bind [and thereby disable] molybdenum with the result that the dehydrogenase reaction cannot take place. Since disulfiram and coprine are very similar in their effects, they may both have a similar affinity with molybdenum.
Symptoms may manifest with alcohol consumption shortly before and up to three days after ingesting these mushrooms. The alcohol "consumption" can be as little as a sniff of alcohol or perfume, or unintentional ethanol use [cough syrups, elixirs, tinctures containing alcohol].
•In rare cases, it also brings about toxic effects after drinking *coffee* or *tea.*
• Preparations of C. atramentarius are used in China as anti-inflammatory

drugs and applied externally to relieve dermatitis, furuncles and sores. Internally, it is considered cold and sweet, and is said to help digestion and reduce phlegm.

Symptoms [after alcohol]

- Apprehension/ sense of impending doom.
- Confusion. Disorientation.
- Vertigo.
- Throbbing headache.
- Headache passing on to a severe cold feeling in the arms and legs.
- Flushing or blotching of face, neck and thorax [histamine induced vasodilation].
- Perspiration face.
- Sensation of swelling and heat of face [subjective].
- Oedema of face [objective],
- Metallic taste in mouth.
- Rotten-egg or garlic-like odour on breath.
- Nausea and vomiting.
- Abdominal pain.
- Palpitations/ chest pain.
- Dyspnoea. Hyperventilation.
- Hypotension or hypertension.
- Tingling sensation in limbs [perhaps due to hyperventilation].
- Cold feeling in arms and legs.
- Numbness in hands.
- Sensation of swelling of hands [subjective],
- Swelling of hands [objective].
- Diaphoresis.
- Weakness. Drowsiness.
- Hangover. [Temporary accumulation of acetaldehyde is responsible for hangover effects.]

Saprophytic.
Pioneer in disturbed ground
Autolysis [self-digestion] - puts on a disappearing act.
Self-destruction for the purpose of reproduction.
Very fragile and shortlived, yet pushy and pressing ahead.
Pops up massively; seizes control; overruns others; monopolizes.
The soldier among mush-rooms. Attila the Hun.
Intolerance of alcohol.
Tippler's Bane.
Swelling, subjectively and objectively.
Molybdenum and zinc.

MATERIA MEDICA

Coprinus atramentarius has, to date, no place in homeopathy. However, its array of intriguing properties should be adequate grounds for its introduction in the materia medica, as should its pronounced clinical effects. By combining the clinical effects and the signatures we get a first idea of the drug picture.

Signatures/ themes

= Disturbed ground.
= Self-destruction. Dissolution.
= Perfect timing.
= Delicate yet strong.
« Soldier. Intruder.
= Control. Suppression.
== Benefit of cooperation.
= Black.

Differential diagnosis

Analysis/ repertorisation of the clinical effects of Coprinum shows similarities with:

Polychrests

Natrum muriaticum	17 of 21 symptoms.
Phosphorus	17/21.
Belladonna	16/21.
Lachesis	16/21.
Mercurius	16/21.
Nux vomica	16/21.
Pulsatilla	16/21.
Silicea	16/21.

Smaller remedies

Carboneum sulphuratum	14/21.
Camphora	13/21.
Secale	13/21.

Digitalis	11/21
Natrum arsenicosum	11/21
Spigelia	11/21
Aceticum acidum [!]	8/21.
Cuprum	8/21.
Vipera	8/21.
Apocynum	7/21.
Nux vomica	5/21
Sulphur	5/21
Belladonna	4/21
Colocynthis	4/21
Conium	4/21
Kali chloratum	4/21
Zincum	4/21

If we repertorise on the clinical symptoms including the modality alcohol [beer and/or wine] the following remedies come closest. It shows the uniqueness of Coprinus.

Of the fungi Bovista has two symptoms related to wine: Confusion of mind and Vertigo.

I D. FAMILY CORTINARIACEAE

Cortinarius orellanus
Gymnopilus spectabilis

CORTINARIUS ORELLANUS **Cort-o.**

Scientific name	Cortinarius orellanus Fr. 1838.
Common names	Plush Cortinarius. Plush Webcap.
Genus	Cortinarius; subgenus Leprocybe.
Family	Cortinariaceae.

KEYS

- Mutualistic [symbiotic].
- Radish-like smell and taste.
- Prefers northern latitudes and autumnal months.
- Kidneys. Renal failure.
- Intense, burning thirst.
- Sensation of coldness.
- Aluminium.

FEATURES

- Cap tawny-brown to orange-brown, velvety; low rounded umbo.
- Cap dry; doesn't change colour with changes in moisture.
- Gills saffron-yellow at first, turning orange-brown to cinnamon-brown when ageing.
- Chief characteristic is the delicate, spider-web-like veil.
- Spores rust-brown.
- Radish-like smell and taste.
- Scattered or in small clumps in poor [acid] soils of deciduous [oak-beech] forests or of mixed forests.
- Mycorrhizal symbionts: oak, beech, and chestnut.
- Late summer to fall.
- Deadly poisonous, along with several other members of the subgenus

Leprocybe, notably C. gentilis, C. cotoneus, C. speciosissimus, C. rubellus. • The genus Cortinarius, sturdy and hardy, prefers northern latitudes and autumnal months.

CLINICAL MANIFESTATIONS

Contains the toxin orellanine, insidiously toxic to the kidneys and causing progressive renal failure.

> In 1965, Grzymala reported the first, and still the largest, series of *Cortinarius orellanus* poisonings. Nineteen patients developed burning of the mouth, thirst, and polyuria after a latent period of 10 to 17 days. Recovery occurred some days later. Seventy-six cases had a more serious intoxication, with a latent period of 6 to 10 days and symptoms including headache, nausea, vomiting, chills, oliguria, lumbar pain, protein, blood, and cells in the urine. Serious renal dysfunction was not noted. All recovered within 3 to 4 weeks.
>
> Forty patients presented after a short latent period of 2 to 3 days. A severe poisoning, with acute renal failure, occurred in 33 cases. Nineteen patients died between the 4^{th} and 16^{th} day. In the others, recovery was slow, within a mean of 7 to 9 weeks, but, in some cases, recovery took several months or years.
>
> In 1990, Bouget *et al.* reported a collective poisoning in 26 soldiers who, during a survival exercise, had eaten a mushroom soup made exclusively with *Cortinarius orellanus.* Five patients had no symptoms, 12 developed acute renal failure that needed haemodialysis in 8 cases. Chronic renal failure was observed in four cases and needed chronic haemodialysis, and renal transplantation was needed in one case.
>
> [Spoerke & Rumack 1994]

Symptoms

- Persistent headache.
- Visual defects.
- Burning and dryness of lips and tongue.
- Impairment or perversion of the sense of taste.
- Tinnitus.
- Nausea and vomiting.
- Anorexia.

Mutualistic [symbiotic].
Radish-like smell and taste
Prefers northern latitudes and autumnal months.
Kidneys. Renal failure.
Intense, burning thirst.
Sensation ofcoldness.
Aluminium.

- Watery diarrhoea or constipation.
- Urination initially excessive, later reduced or ceasing altogether.
- Flank pain.
- Bilateral lumbar pain.
- Muscle pains.
- Paraesthesias.
- Intense, burning thirst.
- Night sweat.
- Chills. Sensation of coldness.
- Somnolence.
- "Unless the patient is able to keep up with the fluid losses, which may require several litres of water a day, the mouth feels dry and the lips and tongue burn. These symptoms are often associated with a sense of exhaustion, lethargy, and a lack of appetite. Pains may develop in the lumbar triangles over the kidneys, and patients may experience generalized musculoskeletal and joint discomfort." [Benjamin]
- Fatty degeneration of liver and severe inflammatory changes in the intestine may accompany the renal damage.

ALUMINIUM

Amanita spp., in particular Amanita muscaria, accumulate vanadium and/or selenium from the soil. Cortinarius spp. is reported to be associated with aluminium levels in the soil. An interesting feature of orellanine is its ability to bind aluminium ions to organic complexes and therefore suppress their toxic effects. The aluminium binding property of orellanine may possibly explain why Cortinarius spp. [C. rubellus in Scandinavian countries] are so frequent in forests receiving polluted precipitation and suffering soil acidification with a high level of soluble aluminium ions in soil water. Only mycorrhizal mushroom species which are able to detoxify aluminium may function normally and outcompete less tolerant species over time.

GYMNOPILUS SPECTABILIS **Gymn-s.**

Scientific name	Gymnopilus spectabilis (Fr.) Singer 1951.
Synonyms	Agaricus spectabilis Fr. 1828. Pholiota spectabilis (Fr.) Gillet 1871. Gymnopilus junonius (Fr.) P.D. Orton 1960.
Common names	Big Laughing Mushroom. O-waraitake.
Family	Cortinariaceae.

KEYS

- Saprophytic.
- Turns green on cooking.
- Shades of yellow; yellow vision.
- Unstoppable, uncontrollable laughing.
- Dancing and singing.

FEATURES

- Cap large [up to 40 cm broad], broadly convex, dry.
- Cap and gills some shade of orange-yellow, becoming rusty with age.
- Very bitter taste.
- Spores bright yellow-brown to rusty-orange.
- Solitary [occasionally] or in clumps on stumps, logs, or on dead or living trees.
- Spring to fall.
- Saprophytic.
- Has the unique property of turning green on cooking.

CLINICAL MANIFESTATIONS

• "If you eat *o-waraitake,* you cannot stop laughing," is a popular Japanese saying, to the truth of which a 20-year-old Japanese man can testify after picking and eating some *o-waraitake* without knowing what they were:

> ... he became intoxicated and broke out in laughter. His hands and feet moved continuously as though he were dancing and he walked in zigzags like someone who had drunk too much sake. The same sort of drunkenness had occurred the previous year but at that time it was much lighter

and no attention had been paid to it. This time, however, after he had eaten mushrooms from the same stump, this normally reticent youth suddenly began to chatter in broken sentences and to dance about. When the poisoning became very evident he went to [a doctor] for help. The patient quickly recovered and was completely normal by the next day.
[Cited in Lincoff & Mitchel 1977]

Other symptoms may occur:

A 56-year-old man ate two to three caps of mushrooms collected by the roadside in front of his house. These mushrooms were later identified as *Gymnopilus spectabilis*. Within 15 minutes, he experienced numbness, blurred vision, and illusions of vivid unnatural colours and "shimmery" yellow objects. Ataxia, slight nausea, and abdominal distress were also described. His wife and a neighbour, who tasted the mushrooms, had a milder effect, with dizziness, giggliness, chills, hot flashes, and difficulty in coordination. Emesis was induced with mustard water, and all three recovered within a few hours. Samples of the mushrooms were analyzed and were positive for indole derivatives. Psilocybin and psilocin were not specifically identified.
[Spoerke & Rumack 1994]

• Shades of yellow; yellow turning green on heating; yellow vision.

An intense encounter with Laughing Jim is described thus:

My first thought when I closed my eyes was actually that I had opened them. I became aware of wide open spaces when I closed my eyes and various curving patterns in pinks ... The patterns seemed to be in perpetual motion and to be alive, that is, I sensed they had a pulse of their own ... My body began to feel numb or as if it were a body but not necessarily my own. This I experienced in a more poignant way when I turned over on my stomach in bed and caught a glimpse of my hand, which had some marks from the pillowcase on it.

It seemed to me the hand of a very aged person and I was startled. I felt some fear and so turned my hand with the palm facing me. It seemed so fleshy and white that I thought of a mushroom and immediately of mortality. I saw that I was made of flesh and that this was corruptible. Yet as I looked at my hand I saw it as a hand, not mine but one lent to me as it

were to use in this life. It was meant to help me and I felt great pity on it because it was after all made of flesh and as prone to decay as mushroom flesh. [A little later, the writer felt hungry.]

I craved something raw and colourful so went to the crisper and took out two bright fuchsia-coloured radishes and first set them on the table. How much they seemed like sperm or tadpoles, the way their central roots shot out like tails. They looked comical and I wanted to laugh ...

[Cited in Schaechter 1997]

• In his capacity of consultant for the Boston Poison Center, Elio Schaechter received a telephone call from an elderly lady who "in the midst of giggles lost no time in coming to the point and wanted to know if she and her dinner guests were about to die" after "a rich pasta dish containing a few mushrooms she had picked off a tree that afternoon." The mushrooms turned out to be specimens of G. spectabilis, so that, when Schaechter suggested "that she was probably not in real danger but should see a doctor anyway, she said: 'You mean, we are not going to die [giggle, giggle]? Good-bye, then!'."

• "Forms in Asia and eastern North-America apparently contain psilocybin and/or psilocin and are hallucinogenic. On the west coast, however, it is apparently 'inactive.' An Ohio woman had an unforgettable experience after inadvertendy nibbling on one. She found herself in an alien world of fantastic shapes and glorious colours, and while concerned friends were rushing her to the hospital, she was heard to mutter, 'If this is the way you die from mushroom poisoning, then I'm all for it .[Arora]

Saprophytic.
Turns green on cooking.
Shades of yellow; yellow vision.
Unstoppable, uncontrollab
laughing.
Dancing and singing.

• Adrian Morgan experimented on a few occasions with this species, "but only once experienced a hallucinatory condition, ... typified by enhanced colour vision, with colours floating off objects and hanging in the air, and a feeling of euphoria. The experience combined elements of the psilocybin and muscimol effects."

• According to Menser [1977], "recent research at the University of Washington has established the presence of bis-noryangonin. This compound is an analogue of yangonin, a weak psychoactive substance found in Kava Kava *[Piper methysticum}.* It is not known if bis-noryangonin is psychoactive, but it is doubtful since it occurs in edible species. The analysis was done on western species, which haven't been reported as psychoactive."

EXHILARATION

A revealing incident of Laughing Mushroom intoxication is included in *Konjaku monogatari* ['Tales of Long Ago'], a collection of stories compiled by Minamoto Takakuni [1004-1077].

> Long long ago, some woodcutters from Kyoto went into the Kitayama Mountains and lost their way. Not knowing which way to go, four or five of them were lamenting their condition when they heard a group of people coming from the depths of the mountains. The woodcutters were wondering suspiciously what sort of people it might be when four or five Buddhist nuns came out dancing and singing. Seeing them, the woodcutters became fearful, thinking things like, 'Dancing, singing nuns are certainly not human beings but must be goblins or demons." And when the nuns saw the men and started straight toward them, the woodcutters became very frightened and wondered, 'How is it that nuns come thus out of the very depths of the mountains dancing and singing?'
>
> The nuns then said, Our appearance dancing and singing has no doubt frightened you. But we are simply nuns who live nearby. We came to pick flowers as offerings to Buddha, but after we had all entered the hills together we lost our way and couldn't remember how to get out. Then we came upon some mushrooms, and although we wondered whether we might not be poisoned if we ate them, we were hungry and decided it was better to pick them than to starve to death. But after we had picked and roasted them we found they were quite delicious, and thinking, "Aren't these fine!" we ate them. But then as we finished the mushrooms we found we couldn't keep from dancing ... ' the woodcutters were no end surprised at this unusual story.
>
> Now the woodcutters were very hungry so they thought, 'Better than dying let's ask for some too.' And they ate some of the numerous mushrooms that the nuns had picked, whereupon they also were compelled to dance. In that condition the nuns and the woodcutters laughed and danced round together. After a while the intoxication seemed to wear off and somehow they all found their separate ways home.
>
> [Cited in Ridgley 1999]

I E. FAMILY
LEPIOTACEAE

Agaricus procerus [= Macrolepiota procera]

AGARICUS PROCERUS **Agar-pr.**

Scientific name	Macrolepiota procera (Scop.) Singer 1948.
Synonyms	Agaricus procerus Scop. 1772. Lepiota procera (Scop.) Gray 1821.
Common names	Parasol Mushroom. Shaggy Parasol Mushroom.
Family	Lepiotaceae.

KEYS

- Saprophytic.
- Brown scales and patches.
- One of the very best of all edible agarics.
- Homeopathic symptoms almost certainly due to misidentification of species.

FEATURES

- Cap white with brown scales and patches; cap weathers to brownish.
- Smooth, dark central umbo on cap.
- Flesh white or tinged reddish. White spores.
- Solitary to widely scattered or in small groups in open woods and in old pastures.
- Saprophytic.
- Name derived from *lepis,* a scale, and *procerus,* tall.

MATERIA MEDICA

Based on poisoning symptoms occurring in “an elderly man and a boy of thirteen.”

> Half an hour after eating the *Agaricus procerus,* an elderly man and a boy of thirteen were attacked with giddiness and staggering, as if they were

intoxicated; and in an hour they became insensible, the man indeed so much so that for some time he could not be roused by any means. Emetics having little effect, the stomach was cleared out by the pump, and powerfol stimulants were employed both inwardly and outwardly, by means of which sensibility was in some degree restored.

Occasional convulsive spasms ensued, and afterwards furious delirium, attended with frantic cries and vehement resistance to remedies, and followed by a state like delirium tremens. The pupils were at first much contracted, afterwards considerably dilated as sensibility returned, and in the boy contracted while he lay torpid, but dilated when he was roused. In neither instance was there any pain felt at any time; nor were the bowels affected. Another boy who took a small quantity only had no other symptom but giddiness, drowsiness, and debility. [Christison 1855]

Saprophytic. Brown scales and patches. One of the very best of all edible agarics. Homoeopathic symptoms almost certainly due to misidentification of species.

Symptoms

Derived from the above cases; presented in Allens Encyclopaedia.

= Furious delirium, with frantic cries and vehement resistance to remedies, followed by a state like delirium tremens.
<» Insensibility.
= Giddiness and staggering, as if intoxicated.
= Pupils contracted; dilating as sensibility returns.
<= Occasional convulsive spasms.
— Debility.
— Drowsiness.

LOOK-ALIKES

The name - Parasol mushroom - and the description in Allen's Encyclopaedia - common in pasture, stem 8-12 inches high, esculent - seem consistent with Agaricus [Lepiota] procerus, but the symptoms attributed to it are definitely not. The Parasol mushroom is considered "one of the very best of all edible agarics" and it is prized by connoisseurs for its flavour. Allergic reactions have been reported and idiosyncrasies can't be excluded, but the semblance of the symptoms recorded in Allen with those of ibotenic acid/muscimol poisoning suggests that the real culprit was one of the

Amanitas containing these toxins.
Many mushrooms are remarkably similar, resulting in misidentification as the commonest cause of mushroom poisoning, the odds of which are increased by the occurrence of hybrids and transition forms between species. This makes fungi into puzzling organisms.
There can be little doubt that the symptoms mentioned above are the result of misidentification. The most likely species for which the Parasol mushroom will have been mistaken is its look-alike *Amanita gemmata,* as is evidenced by several case reports.

> A 31-year-old woman noted motor incoordination and drowsiness 1 hour and 50 minutes after ingesting [A. gemmata] mushrooms. These symptoms were followed by incoherent speech, fatigue, mydriasis, and redness of the skin. Frequent vomiting then developed. ... The patient fully recovered and was discharged on the 3rd day following ingestion.
> A 42-year-old diabetic man developed nausea and vertigo 2 hours after eating *Amanita gemmata* mushrooms. The patient had a feeling of instability and would fall to the ground, remaining very disoriented and only able to follow simple commands. The face was red, and visual hallucinations were present. Full recovery occurred by the 2nd day following ingestion.
> A 12-year-old girl developed nausea, vertigo, disorientation, excitement, urinary incontinence, and visual hallucinations 3 hours after eating *Amanita gemmata* mushrooms. Tachycardia was present at 120 min, the blood pressure was 110/60 mm Hg, and the face was red. This patient fully recovered by the 2nd day following mushroom ingestion.
> [Spoerke & Rumack 1994]

> ... a family of five members consumed a considerable quantity of a dish prepared from this mushroom *[A. gemmata],* which was determined with certainty macroscopically and microscopically. One hour after eating all the members of the family began to feel unwell; they became dizzy and vomited. The father and one of the daughters, who had eaten four and three plates respectively of the dish, had strong cramps and both lost consciousness for a long time.
> The father perspired profusely so that his trousers and bedclothes were wringing wet. The daughter had the pupils of her eyes enlarged to the maximum. When taken to hospital they had their stomachs pumped out and the circulation of the blood was stimulated. After six days father and

> daughter had recovered; the other three members of the family, who had not eaten so much of the mushrooms, only vomited up what they had eaten without any further consequences.
> [Lincoff & Mitchell 1977]

The look-alike *Chlorophyllum molybdites,* a species so closely resembling Lepiota procera that it was once classified in the *Lepiota* taxon, would have been a good candidate as well, were it not for the fact that this species did not occur in Europe until recently. [The poisoning case listed by Allen took p ace in the 1830s in Scotland. Interestingly, it is Scotland where C. molyb- ites was sighted in 1990. Its mycelium probably hitchhiked with a tree imported from Florida.]

CHLOROPHYLLUM MOLYBDITES **Chloro -m.**

Scientific name Chlorophyllum molybdites (G. Mey: Fr.) Massee 1898.
Synonyms Agaricus molybdites G. Mey. 1818.
Macrolepiota molybdites (G. Mey.) G. Moreno 1995.
Lepiota morgani (Peck) Sacc.
Lepiota chlorospora Copel.
Common names Green Gill. Green-Spored Parasol. Sickening Parasol.
Family Lepiotaceae.

KEYS

- Saprophytic fairy ring fungus.
- Green.
- Fond of warm weather.
- Severe gastrointestinal symptoms.
- Forceful, persistent, explosive. Rapid dehydration.
- Difficulty to stand, talk or swallow, from weakness.

FEATURES

- Cap large, broad [10-30 cm], oval or nearly round.
- Ghostly white, "resembling a summer parasol," when young. May have some brownish scales near the centre. Becomes quickly brown, with turned- up edges, during hot and dry weather.
- Gills white to dingy yellow, slowly becoming greyish to greenish with age.
- Stalk white, with a double-edged ring that is easy to move up and down the stalk.
- Flesh white; may discolour slowly pale pinkish red at the base.
- Spores *green.* [Chlorophyllum means 'green gills'; molybdites comes from molybdenum, in allusion to the green compounds formed by this trace metal.]
- Common on lawns and pastures in the summer and fall, often in small or large groups or forming fairy rings.
- Appears in summer or during warm, moist weather.
- Widely distributed in the tropics and warm temperate zone.
- Prefers inland locations.
- Saprophytic.

CLINICAL MANIFESTATIONS

• It is considered a gastrointestinal irritant, but may produce an additional host of other symptoms, including mydriasis or miosis, lethargy and weakness [common], seizures [rare], dizziness, and "fogginess of the brain." Charles Mcllvaine states that "many cases of severe, but not fatal poisoning by it [Lepiota morgani] came within the writers knowledge during the season of 1900-1901," a statement he illustrates by citing "a letter from George B. Clementson, attorney, Lancaster, Wis."

> Lepiota morgani has grown in this locality this season in unusual abundance. While I was absent last week, my father picked a number, mistaking them for L. procera, and my mother, in preparing them for the table, ate a small piece of the cap of one - a piece, she assures me, no larger than a hickory nut. About two hours afterward and shordy after dinner [at which the mushrooms were not served, and at which nothing indigestible was eaten] she experienced a peculiar numbness and nausea, with constriction of the throat. Vomiting set in within half an hour and was excessive, lasting several hours and giving no relief. She was very greatly weakened and thought herself dying, being so reduced at one time that she was unable to see. Purging set in not long after the vomiting. The constriction of the throat did not disappear until after the vomiting stopped.
>
> Whiskey and nitro-glycerine [by the stomach] were given to keep up the heart's action.
>
> It seems probable that the poison itself did not directly affect the heart, but that the alarming weakness was due to the vomiting and purging. That is my mother's own opinion. After being in bed for a day she was able to get around, but suffered considerable pain in the abdomen for forty-eight hours. I presume that owing to the fact that my mother is not very strong and has a weak stomach, she was more violendy affected than many might be. But a poison that in any person can produce such symptoms, when taken in so small a quantity, ought to be labelled decidedly dangerous.
>
> [Mcllvaine 1973]

C. molybdites is among the most common causes of mushroom poisoning in North America, especially in the South, Pacific Northwest, and California. Tens of cases are reported each year. Gastrointestinal symptoms

predominate the picture and victims often require hospitalization. Vomiting is present in 96% of cases, nausea in 79% and diarrhoea in 70%.

- Nausea.
- Vomiting [up to 20 episodes; with or without accompanying nausea]; extremely forceful and persistent.
- Colicky abdominal pain [which can mimic that of a 'surgical' abdomen].
- Diarrhoea; watery, may contain mucus or blood.
- Diarrhoea forceful, explosive; persistent.
- Concomitants: dehydration; dizziness; cold sweat; chills; weakness; tachycardia.
- Difficulty to stand, talk or swallow, from weakness.

More rare symptoms and signs include:

- Altered perception.
- Haziness or fogginess of the brain.
- Extreme sensitivity to light and sound.
- Pressured speech and anxiety.
- Drowsiness.
- Muscle spasms. Tremors.
- Diffuse muscle tenderness.
- Convulsions.
- Salivation; lachrymation.
- Cyanosis of lips, tongue, and nails.
- Pallor.
- Pharyngeal spasms.
- Diffuse abdominal tenderness.

[Spoerke & Rumack 1994]

Saprophytic fairy ring fungus.
Green.
Fond of warm weather.
Severe gastrointestinal symptoms.
Forceful, persistent, explosive.
Rapid dehydration.
Difficult to stand, talk or swallow, from weakness.

• Intraperitoneal injection of C. molybdites extracts resulted in rats in "psychotropic" activity, such as stereotypy, disorientation, fearful reactions, mydriasis, lachrymation, and hyperaemia.

I E FAMILY PAXILLACEAE

Paxillus involutus

PAXILLUS INVOLUTUS **Pax-i.**

Scientific name Paxillus involutus (Batsch) Fr. 1801.
Common names Poison Pax. Inrolled Pax. Naked Brimcap.
Family Paxillaceae.

KEYS

- Mutualistic [symbiotic].
- Acid soil.
- Sour smell.
- Sour taste in mouth.
- Haemolytic anaemia.
- Kidney failure.

FEATURES

- Cap brown; cap margin typically inrolled.
- Gills pale yellowish when young and brownish in age.
- Flesh pale buff to yellowish, staining reddish to brown when bruised or handled.
- Spores brown to yellow-brown.
- Sour smell.
- Cosmopolitan; scattered to densely gregarious on ground in woods and around the edges of bogs. Summer to fall.
- Thrives in soils with relatively abundant available nitrogen.
- Mycorrhizal symbionts: conifers, oak and birch.

CLINICAL MANIFESTATIONS

Causes immunohaemolytic anaemia and kidney failure.

Symptoms

- Acid-sour taste in mouth.
- Loss of vision [due to central retinal necrosis] [one case].
- Stomach and abdominal cramps.
- Vomiting and diarrhoea.
- Haemoglobinuria.
- Decreased urine output.
- Severe chest and lower back pains.
- Cold extremities.
- Perspiration.
- Weakness.
- Collapse with hypotension. Coma.

Mutualistic [symbiotic].
Acid soil.
Sour smell.
Sour taste in mouth.
Haemolytic anaemia.
Kidney failure.

Haemolytic anaemia generally develops in individuals who have eaten *Paxillus involutus* for many years with no ill effects. For reasons presently unclear, a few people produce IgC antibodies to an unidentified antigen in the mushroom. During the course of a subsequent meal, antigen-antibody complexes form, agglutination occurs, complement is fixed, and the red blood cells undergo intravascular haemolysis. The onset of the symptoms is rapid, developing within two hours of the mushroom meal. The initial symptoms include vomiting and diarrhoea, abdominal pain, and collapse with hypotension. A rapidly developing anaemia, with a rise in indirect bilirubin and free haemoglobin [if the haemolysis is massive], a fall in the level of haptoglobin, and haemoglobinuria are all part of the syndrome. The usual renal complications may follow, with kidney failure and renal pain.
[Benjamin 1995]

Paxillus involutus

I G. FAMILY RUSSULACEAE

Agaricus emeticus [= Russula emetica]
Russula foetens

AGARICUS EMETICUS **Agar-em.**

Scientific name	Russula emetica (Schaeff: Fr.) Gray 1821.
Synonym	Agaricus emeticus Schaeff. 1774.
Common names	Emetic Russula. The Sickener.
Family	Russulaceae.

KEYS

- Saprophytic.
- The Sickener.
- Loses all colour from exposure to strong sunlight.
- Brittle; shatters and snaps.
- Choleraic gastrointestinal disorders.
- Anxiety in stomach [deathly nausea], > ice-cold water.
- Resembles acute phosphor poisoning.
- Smell of vinegar <.

FEATURES

- Cap smooth, bald, greasy and shiny.
- Cap bright red to scarlet; may turn very pale after rain or become completely decolourised by strong sunlight.
- Gills pure white when young, later yellowing. Spores white.
- Stem pure white, resembling cotton wool with age.
- Acrid, burning taste.
- Scattered or in groups on acid soil, particularly among sphagnum and other mosses in wet or boggy pine-forests.
- Cosmopolitan. Summer to fall.
- Saprophytic.

• "Pleasing to the eyes of all, to the tongues of some, but to the stomachs of none. Can be used to induce vomiting, as its name implies." [Arora]
• In Slovakia and Hungary, the skin of Russula emetica is used as a peppery condiment to add flavour to goulashes.
• Closely allied to Lactarius [Milk Cap] but separated by the absence of milk. The gills of some species exude watery drops in moist weather.

BRITTLE

• Russulas almost always have brittle gills [lamellae] that break up when a finger is run over them. "Russulas can be readily identified by their brittle texture. When you snap the stem apart, it will feel like breaking a piece of chalk. An even more destructive russula test is to throw a specimen against the nearest tree trunk: russulas will shatter, other mushrooms will stay pretty much whole." [Schaechter]

CLINICAL MANIFESTATIONS

• Contains sesquiterpenes, which cause what has been termed the "resinoid syndrome" and consists of violent choleraic diarrhoea.
Symptoms occur from 30 minutes to 3 hours after ingestion and include abdominal pains, colic, choleraic diarrhoea, vomiting, and, due to dehydration and loss of electrolytes, acidosis, cramps in calves of legs, and shock.

• Muscarine has been reported in Russula emetica, but the report has not been confirmed. "It has long been believed that muscarine plays a role in the toxicity of *Russula* species, because some of the early biological assays and chromatographic studies demonstrated its presence in collections. However, this belief has been contradicted by other studies. At present, muscarines contribution, if any, is unclear and probably negligible." [Benjamin]

MATERIA MEDICA

Based on poisoning cases [Allen].

= *Vertigo* so severe that one must be carried to bed; is not able to sit or stand. = Lachrymation [from the smell]. Lasting weakness of eyes.
= Sneezing [from the smell].

— Sharp burning in mouth.

“ Violent vomiting, with *anxious* sensation, as if the stomach hung on threads, which would be momentarily torn into, *with ice-cold sweat efface,* and constantly renewed faintness, even from moving the head on listening to reading; < smelling cordials, especially vinegar, which is unbearable.

« Violent burning pain in stomach becomes a sensation as if a moving dull body in the stomach pressed it out; now in one place, now in another, with nausea and great qualmishness, violent eructations, and weak eyes.

=» Painful pressure in stomach, followed by frequent eructations, repeated attempts to vomit.

-» Constantly increasing *anxiety in stomach.*

= Sudden, violent longing for *ice-cold water* [during the worst attack of anxiety], *which causes gradual relief.*

= Stomach so sensitive for eight days that one could not touch it, nor cough.

<· Abdomen distended.

-» Constantly increasing pain in abdomen [for half hour].

= Sudden great weakness [quarter of an hour].

= Dislike for wine and meat [several days].

Saprophytic.
The Sickener.
Loses all colour from exposure to strong sunlight.
Brittle; shatters and snaps.
Choleraic gastrointestinal disorders.
Anxiety in stomach [deathly nausea], > ice-cold water.
Resembles acute phosphor poisoning.
Smell of vinegar <.

NOTE: We find Agar-em. in Kent’s Repertory, and subsequently in modern repertories, under Mind, Anxiety > cold drinks. The poisoning symptoms, however, indicate that it concerns an anxious sensation in the stomach, in the sense of *deathly nausea.* Hence Agar-em. should be placed in Nausea > cold drinks. The modality ‘better by cold drinks’ has an even wider application:

> “The smell of the fresh mushroom is reported to evoke retching and vomiting in persons susceptible to it. The intoxication caused by Russula seems to bear a close resemblance to acute phosphorus poisoning. ... The pains [in stomach and abdomen] may persist for days. Drinking of cold water mitigates the pains.” [Lewin]

Voisin[1] associates the symptoms with a clinical syndrome termed “deathly vomiting”:

= Repeated and violent vomiting accompanied by: « Vertigo.
= Anxious and faint sensation in stomach.
® Cold sweat.
«· Weakness.
= Strong craving for ice-cold water [which >].

He differentiates with:
« *Antimonium tartaricum.* Vomiting may lead to fainting, is not so strongly linked with vertigo, and is followed by drowsiness.
<= *Tabacum.* More general coldness and no desire for cold water.
= *Veratrum album.* More abdominal cramps, less vertigo, less thirst.
« *Theridion.* Vomiting and vertigo < closing eyes, nausea > warm drinks.

1 Henri Voisin - Materia medica des homoopathischen Praktikers, 3. Auflage; Heidelberg 1991.

RUSSULA FOETENS **Russ-f.**

Scientific name Russula foetens Pers.: Fr. 1821.
Common name Fetid Russula.
Family Russulaceae.

KEYS

- Saprophytic.
- Heavy empyemic odour; odour absent in very dry weather.
- White flesh turns brown on exposure to air.
- Choleraic symptoms.
- Coldness and cyanosis.
- Attack followed by painful boils

FEATURES

- Cap dingy yellow, often becoming pale; viscid in moist weather.
- Cap covered with a separable pellicle.
- Flesh white, turning brown on exposure to air.
- Stem stout, at first solid, later hollow with age, whitish.
- Acrid taste.
- Distinct from all others in its very heavy empyemic odour.
- Odour may be absent in very dry weather.
- Solitary or in groups in moist woods. Common.
- Summer to fall.
- Saprophytic.

CLINICAL MANIFESTATIONS

- *See* Russula emetica.

- The eye symptoms and the muscular spasms resemble the action of muscarine, but its presence in R. foetens has not been demonstrated.

MATERIA MEDICA

Although this robust species is “better punched than munched” on account of its “disgusting taste and nauseating odour,” Alphonse Barrelet observed the effects of eating the cooked mushrooms.

The symptoms come from a single poisoning case [Allen].

Nausea, colic, vomiting, diarrhoea, cold extremities, and cyanosis of the face.
Pupils at one time normal, at another dilated, at another contracted.
Constant trembling of the muscles, at times interrupted by tonic contractions, increasing to general clonic spasms, with complete loss of consciousness.
Involuntary micturition.
Consciousness returned on the third day; the patient could hear but was completely blind.
The muscular spasms, the deathly anxiety, and the dyspnoea gradually disappeared, but for three days there were constant hallucinations of mind.
This attack was followed by pseudo-erysipelas on the elbows and painless furuncles over the whole body, especially on the scapulae and small of the back.
The patient recovered after two or three weeks.

Saprophytic.
Heavy empyemic odour; odour absent in very dry weather.
White flesh turns brown on exposure to air.
Choleraic symptoms.
Coldness and cyanosis.
Attack followed by painful boils

I H. FAMILY STROPHARIACEAE

Agaricus semiglobatus [= Stropharia semiglobata]
Agaricus stercorarius [= Stropharia stercoraria]
Psilocybe caerulescens
Psilocybe semilanceata

AGARICUS SEMIGLOBATUS **Anar se**

Scientific name Stropharia semiglobata (Batsch: Fr.) Quelet 1872. **Synonyms** Agaricus semiglobatus Batsch 1783.
Psilocybe semiglobata (Batsch: Fr.) Noordeloos 1995.
Common name Hemispherical Stropharia.
Family Strophariaceae.

KEYS

- Saprophytic.
- Coprophilous [dung-loving],
- Grows in families with other dung-loving species.
- Incoordination.
- Space and time distortion.

FEATURES

- Cap pale yellow to straw-coloured.
- Cap viscid when moist.
- Gills at first greyish, then dark purple-brown to black.
- Spores dark purple-brown to black.
- Solitary or in small groups on dung, manure, rich soil, straw, and grazed or fertilised grassland. Common on cow dung. July to November, fruiting whenever it is damp.
- Saprophytic.
- Probably identical to Stropharia stercoraria, but “cap usually flat at maturity and stalk not viscid or only slightly so.”
- Often found in the company of the Panaeolus campanulatus group.

IDENTIFICATION

• A generally used mushroom identification guide in the early 19th century
- from which period most mushroom poisoning cases stem that are included in the homeopathic materia medica - was Sowerby's *Coloured Figures of English Fungi.* The differences between the nomenclature then and now make it difficult to determine the exact species responsible for the poisonings. Regarding the name and the toxicity of the species in question - S. semiglobata
- a comment by Ramsbottom might help us out.

> Sowerby in 1809 gives two plates of what he calls *Agaricus virosus,* which for the most part is *Stropharia semiglobata* [Pl. 185, p. 131], though four figures of *Panaeolus* are included. He believed that all the figures referred to the same species which "may be equally noxious, under every form in which it may appear ... and which were the same sort that had fatal effects at Mitcham upon those who eat of them." [Ramsbottom 1953]

Sowerby coined the name to serve as a caution, virosus meaning 'poisonous'. The poisoning cases in Allen are without reference, but could have been the Mitcham cases. Misidentification, however, seems quite likely, since Stropharia semiglobata is "edible, but slimy and mediocre according to most sources," as David Arora puts it. The symptoms appear to have been caused by amatoxins, which makes potentially fatal look-alikes, e.g. certain Conocybe species [Cone Heads], more probable candidates.

• A mushroom identified as *Panaeolus [Stropharia] semiglobatus* caused in an experimenter "dizziness, incoordination, unprovoked hilarity, depression, and space and time distortion."

Saprophytic. Coprophilous [dung-loving]. Grows in families with other dung-loving species. Incoordination. Space and time distortion.

MATERIA MEDICA

Based on poisoning cases [Allen].

Symptoms
« Spirits exhilarated.
» Stupor.
® Tongue parched; slightly streaked with white.
= Severe pain in bowels, < pressure, & violent vomiting and purging.

*= Urine scanty.
» Miscarriage in second month.
= Fatal convtdsions.

AGARICUS STERCORARIUS **Agar-st.**

Scientific name Stropharia stercoraria.[1]
Synonym Stropharia semiglobata var. stercoraria (Schumach.) J.E. Lange 1939.
Common name Dung Roundhead.
Family Strophariaceae.

1 Nomenclature: Flora Danica Online, a project by the Danish National Library of Science and Medicine.
This species is probably identical to the species now classified as Psilocybe semiglobata [see A. semiglobatus].

KEYS

- Saprophytic.
- Coprophilous [dung-loving].
- Grows in families with other dung-loving species.
- Disorientation.
- Disposition to rove. Irresistible desire to run.
- Wild, as if moved by sudden impulses. Bewildered.
- Twitching of facial muscles.

FEATURES

- Cap hemispherical [rounded] or broadly bell-shaped.
- Cap pale yellow to straw-coloured.
- Cap viscid when moist.
- Gills at first greyish, then dark purple-brown to black.
- Spores dark purple-brown to black.
- Solitary or in small groups on dung, manure, rich soil, straw, and grazed or fertilised grassland. Common on cow dung. July to November, fruiting whenever it is damp.
- The specific name is derived from the minor Roman deity Stercutus, alias

Sterculus, Stercutius or Sterculius, a son of Faunus, and the patron of manuring.

- Saprophytic.
- Often found in the company of the Panaeolus campanulatus group.

MATERIA MEDICA

= The drug picture derives from the poisoning case of a 39-year old man “who ate about a pint stewed with bacon”.

Saprophytic.
Coprophilous [dung-loving].
Grows in families with other dung-loving species.
Disorientation.
Disposition to rove.
Irresistible desire to run.
Wild, as if moved by s udden impulses.
Bewildered.
Twitching of facial muscles.

In half an hour he complained of nausea, some oppression in his breathing, and of severe pain across the forehead, with giddiness. His wife now noticed a strangeness in his appearance, and that in attempting to walk he kept his eyes fixed on the ground and guided himself with difficulty. He was, however, quite conscious of everything, and opened a book to see if he could read, but found that he was unable to make out any of the letters. When out of doors he continued to suffer severely from the pain across the forehead, with giddiness, and in addition, experienced a feeling as if something was continually over his head, or as if passing “through an arcade.” He also staggered much.

About 11 P.M., after more than three hours, Mr. Hicks was called to see him. He found him sitting down in a semi state of stupor, with pupils dilated and inactive, and the pulse slow and feeble, from 55 to 60. On being roused and made to get up he looked completely bewildered, staggered as if tipsy, and said he could not recognize the things in the room, nor the room itself as that which he usually occupied. He now became more resdess, threw his arms about, and seemed anxious to be continually moving from place to place.

He also appeared to be somewhat convulsed, with twitching of the muscles of the face and complained of pricking in his hands, and of a feeling as if they were swelling. He suddenly became more excited, and rushed wildly out of the house into the street. He was found in a neighbour’s house, considerably prostrated after his exertions, and in a very lethargic state. Twenty grains of Sulphate of zinc were now administered, and in a short time vomiting ensued, much dark fluid with numerous pieces of fungi being brought up.

For a short time afterwards he expressed himself as feeling better, and allowed himself to be taken to the door of the cottage. Almost immediately afterwards, as if moved by a sudden impulse, he again rushed wildly out, but after going a short distance stopped suddenly, as if bewildered. Emetics were again administered and the stomach pump used, and in the course of a few hours he gradually recovered, though feeling much prostrated. He said that during the whole time he was quite conscious of what was being done, but that at times he felt drowsy and inclined to sleep.

When the convulsive paroxysms came on he felt wild and excited, with an irresistible desire to move about and to run. He had no pain in the stomach or bowels at any time, nor did the feeling of oppression in his breathing continue after the first symptoms.

Symptoms

" Confusion; doesn't recognize his surroundings/ his own room.
Irresistible desire to move about and to run. Disposition to rove.
- Rushes wildly out of the house into the street, as if moved by a sudden impulse.
" Rushes out but stops suddenly, as if bewildered.
" Vertigo & severe pain across forehead.
" Vertigo; keeps eyes fixed on the ground when attempting to walk.
« Vertigo & staggering [as if intoxicated].
" Vertigo & sensation as if walking through an arcade.
" Pupils dilated; no reaction to light exposure.
- Twitching of muscles of *face.*
~ Tingling sensation in hands.
Sensation as if hands were swelling.
" Prostration and lethargy after physical exertion.
« Drowsiness.

In addition, Synthesis repertory has

=» Attempts to escape.
" Wildness before convulsions and excitement after.
= Pessimist.

PSILOCYBE CAERULESCENS **Psil.**

Scientific name	Psilocybe caerulescens Murrill 1923.
Synonym	Psilocybe caerulescens var. mazatecorum Heim 1957.
Common names	Landslide mushroom. Bluing Psilocybe.
Family	Strophariaceae.

KEYS

- Saprophytic.
- Landslide mushroom.
- Grows in clumps, 'families'.
- Altered time and space sense.
- Alteration of body image.
- Omnipresent and omnipotent.
- Red and green colours.
- Crossing of the senses.
- Sense of impending doom.
- Increased body temperature.

FEATURES

- Cap deep green to black, fading with age; smooth and sticky.
- Cap cone-shaped when young, expanding to convex/flat. No umbo [nipple].
- Gills light grey to dark brown, blackening with age.
- Spores deep purple brown.
- Stains blue when injured or bruised.
- On recently disturbed land, landslides, sugar cane mulch and other debris. Late spring and summer.
- Typically grows in clumps of five or six mushrooms, called 'families' by the natives.
- Known locally as "sacred mushroom of landslides," "dear little things that leap forth," "little thing that comes out of the earth of a landslide," and "mushroom of reasoning."
- Saprophytic.

CLINICAL MANIFESTATIONS

[includes effects of psilocybin]

See Psilocybe semilanceata.

- Depersonalization; unreality; altered time and space sense; sense of augmentation of body volume or sense of lightness.
- Visual distortions; brightness or warming of colours, particularly red and green.
- Synaesthesias [crossing of the senses]: "feeling colours," "seeing sounds."
- Delusions: ghost-like figures; dragons; Martians.
- Recalling of emotionally loaded conflicts.
- Lassitude; exhaustion. Disorientation.
- Tachycardia.
- Increased body temperature.

> Time contraction is another phenomenon that has been investigated in human volunteer studies. Psilocybin administration consistently induces an experience of overestimation of chronological time or an increased data content within a fixed time unit. This can be measured by counting the length of pauses while the subject is reading aloud. In psilocybin-treated subjects, the duration of pauses decreased while the total time to complete reading the passage was essentially unchanged.
>
> This invariance was explained by an increase in word duration. Another method of measurement is the rate of finger tapping, which increases during the peak effect of psilocybin. Time contraction may be related to the increase in body temperature. When the metabolic rate is increased, clock time is overestimated; time appears to pass slowly, yet subjects arrive early to scheduled appointments.
>
> A concomitant phenomenon of space expansion has been described during psilocybin time-contraction experiments. In these studies, handwriting amplitude, the rate of writing, and the amount of pressure exerted on the paper increased during drug exposure.
>
> [Spoerke & Rumack 1994]

DOOM

A sense of impending doom, resulting in panic attacks, or the opposite, recklessly and fearlessly running about in the most dangerous places, is part of the drug picture of both Psilocybe and Amanita and possibly of fungi in general. The case is on record of a woman who, after ingestion of one dried cap of Psilocybe cyanescens, "kept yelling that she did not want to die" and asked her companion over and over, "Please, don't let me die." The following is a description of another similarly unpleasant experience of the deep fear that Psilocybe can evoke.

> I remember as the trip began that every time I closed my eyes huge, vividly coloured plants would seem to grow really rapidly in the darkness behind my eyelids. I found this pretty interesting and entertaining. ... [Later that night] I lay there looking up into the darkness and perceived the darkness to begin to move ever so slightly in a circular motion. ... In my mind it was the darkness that was moving. ...
>
> The sense of moving darkness was quite frightening. As I stared into the darkness it began to swirl slightly faster, and I had the feeling that it was moving toward me - bearing down on me. Lightly at first, but the force seemed to increase as the swirling gained speed. Before long I was continuously fighting with that swirling dark force, having to push hard against it with my mind to keep it at bay. The process continued.
>
> The swirling got faster, and the darkness now seemed bent on overtaking me. I was overcome with the thought that if I let it get all the way to me that I would be dead. So, I mustered all the concentration and focus I could to continue holding it off. I struggled for some time, but very slowly it seemed to wear me down.
>
> I remember thinking that it was going to win, and I was going to die. I held it off with all the will I could muster, and finally, feeling quite exhausted, gave up with the thought that fighting that force was useless and I should just let it take me. So I did. I relaxed and felt that at least I was facing my death calmly.
>
> The swirling malevolence seemed to enter into my body in the middle of my belly. Then everything was calm and quiet again. I really thought I was dead.
>
> After a brief moment, I remember suddenly feeling that an intense white light was bursting from within me, moving outward. It was as if single, white laser beams were shining out through each and every pore of my

> skin. Later I remember interpreting the experience in terms of my fear of, and struggle with, my image of my own death. But while it was going on, I was more afraid than I can ever remember having been.
> [Cited in Kuhn et al. 1998]

It is not just bliss and divine inspiration that magic mushrooms induce. The Franciscan missionary Toribio de Benavente [Motolina] described some of the Mexican experiences in his *Historia de los Indios de la Nueva Espana* [1569].

> Some sang, other wept, for the mushrooms already intoxicated them. Some did not want to sing but sat down in their quarters and remained there as if in a meditative mood. Some saw themselves dying in a vision and wept; others saw themselves being eaten by a wild beast; others imagined that they were capturing prisoners in batde, that they were rich, that they possessed many slaves, that they had committed adultery and were to have their heads crushed for the offence, that they were guilty of a theft for which they were to be killed, and many other visions which they saw [Cited in Hudler 1998]

MATERIA MEDICA

Proving

[1] David Flores Toledo, 1968, 43 "experimenters." The experiments included ingestion of the mushroom, olfaction ["involuntarily inhaling the substance while preparing the mother tincture"], and application of five different potencies [5x, 6c, 12c, 30c, LM6]. A full account of the "initiation of a pathogenesia" was published in *La Revue Beige d'homeopathie,* 1984, 36 [1], p. 27-53.

Affinity

Mind and CNS.
Head.
Gastrointestinal tract.
Mucous membranes [nose; throat; lungs].

SYMPTOMS

MIND

Superhuman; omnipresent and omnipotent
= Delusion being in visual touch with God; of being possessed by a divine force; of telepathically speaking with superior spirits.
- Delusion of being two or three personalities at the same time that cannot fuse, as if looking in several mirrors and the different images spoke with one and yet among themselves.
= Delusion of being able to be in several places at the same time and think differently in each place.
·> Delusion of being able to resolve whatever problem of mathematics or being able to understand any language.
» Delusion body is lighter than air. Sensation of flying.
= Alternatively attracted to [or possessed by] God and Devil.

Distraction; confusion; detachment; disorientation
<· Forgetful; forgets everything, but doesn't feel worried.
« Indifference to surroundings, family and personal problems being of no consequence.
=> Indifference to ethical and religious principles.
» Loses thread of conversation.
« Loses way in well-known streets.
« Forgetful/ weakness of memory for what one was about to do and for what one just has done.
= Distracted; going to bus stop without money; getting on subway without inserting ticket.
« Impossible to memorize what was studied, to remember what was learned, with a fixed stare.
= Failed five times an examination [without caring], from mental weakness [in a prover who had never failed an examination before].

Lack of control
■ Involuntary laughter. Laughing without reason.
= Great sadness and uncontrollable desire to cry; upon waking.
~ Extreme nervousness, < at night.
«= Making jokes; hiding things.

Time perception/ Activity
~ Time seems to fly.
— Hurried. When walking feels as if urged forward.
= Remains in one position.
« Feeling comfortable, even when lying on the ground.

Communication
« Unwilling to speak.
= Answers laconically.
« Angry with everyone and no desire to speak [first day].
« Quieter than usual.
=» No desire to speak [in afternoon] when there are many people.
— Difficulty in speaking in morning on waking [from mucus in throat].

Recollection
“ Recalling the past in great detail, as if something was left undone, making one melancholic.
= Desire to cry over a sad picture that years before was very sensitive.

Sensory
= Vivid hallucinations of bright colours.
— An old and badly dressed woman looks young and beautiful.
== Interior of bed appears illuminated.
<= Primitive chants seem sublime.
“ Hearing acute [for the sound of rain]; human voice perceived as normal.
= Sound as from bells in ears.
= Hears humming and fragments of songs.
«· Sensitive to music.

Dreams
== Of being robbed and attacked in own house and being incapable of defending oneself.
= Of being chased by a vampire in a big house and being pursued by it outside the house.
=> Of eating frogs with thorns [waking up with epigastric pain].
= Of coloured mushrooms.

GENERALITIES

Energy
<· Tiredness and weakness.
After breakfast.
After eating, with desire to take a nap, > motion.
After a short walk.
After stool [unable to get up from toilet].
When sitting, & nausea.
Has to think about whether he wants to move even a finger.
Accompanied by:
Chills in nape of neck.
Drowsiness [sensation of heavy weight on eyelids].
Perspiration, and pain in joints [at 5 p.m.].
Sensation as if having been drinking.
Sensation of fainting.
Tired feeling in limbs.
Weak feeling in dorsal region and upper limbs.

<= Clear-headed and not fatigued despite lack of sleep.

Temperature
« Shivering sensation all over body, > after sleep.
“ Great sensitivity to cold water.
« More resistant to cold [using less covers, coats, clothing].
- Sensation of warmth [without fever]; feels better in open air.
<= Flushes of heat; at night.

Appetite & thirst/ Digestion
» Voracious appetite; desire to eat all the time; gets up at midnight to eat.
» Thirst, not > drinking.
~ Slow digestion, & suffocating sensation at night, > cold drinks.
» Sour eructations after spicy and fatty food.
- Nausea from smoking.
= Nausea/ retching from smell of liquor.
= Drinking > heavy sensation in stomach. [Should this read: Heavy sensation in stomach > drinking ?]

Sleep
” Sleeplessness; can only sleep on abdomen.
“ Overpowering sleepiness.
= Drowsiness after eating.
” Unrefreshing sleep; no desire to rise; unrefreshed after 8 hours of sleep.
= Sleepiness during pain.

Dryness
= Sensation of obstruction of nose & watery discharge.
“ Sensation of dryness of mouth & salivation.
“ Sensation of dryness of throat, not > drinking.
=» Sensation of sweating around the mouth, but the skin is dry.

Enlarged sensation
= Left eye.
= Left tonsil.

LOCALS

Vertigo
=· *Accompanied by:*
Heavy sensation in body, must sit or lie down.
Trembling sensation.
Tendency to fall [to right side].
Sensation of fainting.
Blurred vision.

Head
” Temples, pressing pain; & drowsiness.
=» Temples, while chewing.
“ Right temple, pulsating, & pain in right thigh [anterior],
“ Right temple, after a cold bath, > heat.
— Right temple, suddenly after exposure to coldness, > warm room; reappearing on exposure to draft.
“ Forehead [heaviness], < bending head forward [= throbbing pain], with restlessness.
“ Left frontal region, < sun.
“ Right frontal region, above eye, in small spot.

Accompanied by:

Dizziness, luminous patterns before the eyes, and burning feet.
Drowsiness.

Intermittent pain in right lumbar region [with shooting pain in right temple]·

Pain in left half of chest, < breathing and coughing, later moving to left dorsal region.
Tiredness and mental depression [during dull headache].

Migraine headache patients were found to be more sensitive to the hallucinogenic effects of psilocybin in a placebo-controlled study of 30 normal subjects and 36 migraine patients. After an oral dose of 20 mcg/kg, no reaction occurred in 86% of normal subjects compared to 41% of migraine patients. Hallucinations occurred in 18% of migraine patients and in none of the normal. Possible mechanisms for this increased sensitivity are increased blood-brain barrier permeability and/or CNS serotonin supersensitivity.
[Spoerke & Rumack]

Saprophytic.
Landslide mushroom.
Grows in clumps, families'.
Altered time and space sense.
Alteration of body image.
Omnipresent and omnipotent.
Red and green colours.
Crossing of the senses.
Sense of impending doom.
Increased body temperature.

Nose

= Violent attacks of coryza; coryza in a warm room.
= Fluent coryza, left nostril, < closed rooms, after violent sneezing.
= Obstruction of nose & watery discharge.
= Sneezing in morning on waking and after rising; smell of old catarrh.
• Light epistaxis when running.

Peculiars

= Metallic taste in mouth & choking sensation in oesophagus.
= Intense dryness of throat after a disagreeable emotion.
= Dryness of throat & lump sensation; must swallow saliva; & intense thirst.
» Dull, sore throat ache, < chewing, swallowing, opening and closing mouth; extending to left ear when touching throat.
« Tonsillitis from smoking and tobacco smoke.
= Empty sensation in stomach in morning, > pressure [tightening belt].
= Flatulence all night.
» Pain in region of heart, < motion, laughing, exertion.

« Cough; dry, < talking, coldness, > sucking a caramel; < smoking; < drinking cold water; & difficult expectoration [greenish-yellowish colour and sticky consistency].
= Shortness of breath when moving/ walking, provoking anxiety.
“ Fingertips wrinkled as from dehydration, with desquamation spreading to palm of hand.
« Hot hands and hot feet.
“ Pains extending from left to right [in knees and soles of feet].

REPERTORY

Psilocybe caerulescens is present in numerous small rubrics [maximum 5 remedies]:

== Absentminded when conversing.
== Abstraction of mind & fixed eyes.
— Delusions: ants.
= Delusions: old ragged woman seemed beautiful.
— Delusions: changing suddenly.
« Delusions: that he is comfortable while sitting on something hard.
= Delusions: has creative power.
« Delusions: he is alternately God and possessed by the devil.
« Delusions: he is in communication with God.
■» Delusions: he possesses infinite knowledge.
» Delusions: music, hearing sweetest and most sublime melody when listening to primitive music.
= Delusions: everything seems unreal while in company.
« Sadness about past events.
= Vertigo accompanied by blurred vision.
= Head pain accompanied by other pains.
= Head, pain in forehead in sunlight.
— Nose, sneezing after rising.
“ Generals, draft of air >.
= Generals, weariness during rest.

PSILOCYBE SEMILANCEATA **Psil-s.**

Scientific name	Psilocybe semilanceata (Ft.) Kummer 1871.
Synonym	Agaricus semilanceatus Fr. 1838.
Common names	Liberty Cap. Pixie Cap.
Family	Strophariaceae.

KEYS

- Saprophytic.
- God and Devil; conflicting parts of the psyche.
- World unfolding between the extremes of frightening and enlightening.
- Dysphoria - euphoria.
- Altered time and space sense.
- Nature awareness; tree hugging.
- Immoderate laughing; indifferent to reprimands.
- Coldness and numbness.

FEATURES

- Cap shades of brown, narrowly conical or bell-shaped with a pointed umbo [nipple],
- Cap covered with a pellicle which is viscous and separable in wet weather.
- Cap hygrophanous, i.e. it darkens when wet.
- Gills pallid, becoming brown and finally dark purple-brown.
- Stem whitish or with brownish base, turning blue when injured or bruised.
- Spores purplish brown.
- Widely scattered to gregarious in damp pastures or meadows.
- Widely distributed; most common British species.
- Has a penchant for the rich organic material of dung or manure [Benjamin]. Not on dung [Arora]. Often on cow dung, never on artificially fertilised fields [Bonnet]. Grows after rains in open, recently used cow pastures [Weil]. Seldom found growing on dung and is not found in the forest; most often found around grass roots, and may rely on them somewhat for survival; seldom grows in domestic grassy areas unless planted. [Menser]
- Saprophytic.
- The common name derives from the Cap of Liberty - a French Revolutionary emblem worn by the figure of Liberte in art from post-revolutionary France - which, in turn, comes from an ancient symbol, the Phrygian bonnet.

CLINICAL MANIFESTATIONS

[includes effects of psilocybin]

See Psilocybe caerulescens.

• Psilocybin is the most abundant tryptamine in Psilocybe fungi. After ingestion it is rapidly converted in the intestine into the metabolite psilocin, which is thought to be responsible for the psychotropic effects. Psilocin distributes uniformly in most body tissues, except for higher concentrations in the *liver* and *adrenals.* If what has been found in rats applies to humans as well, psilocin concentrates in specific areas of the brain: the neocortex, the hippocampus [involved in learning and memory], and thalamus [sensory processing]. [1]

The following are common symptoms reported during a typical Psilocybe intoxication:

- Onset: dizziness, giddiness, nausea, weakness, muscle aches, shivering, anxiety, restlessness, and abdominal pain.
- Hallucinogenic and physiologic effects: visual effects which include brightening and distortion of colours, after-images, visual patterns, and wave-like motion of surfaces, altered faces; increased body temperature, facial flushing, tachycardia [increased heart rate], dilation of pupils, sweating; feelings of unreality and depersonalization, dreaminess, panic feelings; impaired judgement of distances, incoordination; impaired judgement of time; also, a schizophrenic state of double-conception of both slightly altered real world events and hallucinatory effects has been described. Uncontrollable laughter.
- Recovery: gradual waning of above effects; headache; extreme fatigue, resulting in 10-15 hours of sleep; profound mental depression; decreased appetite [and salivation]. [2]

- In a study of 27 cases of P. semilanceata ingestion recorded at a British hospital, two patients complained of episodes of panic attacks after ingestion of alcohol, one seven days after the initial ingestion of mushrooms, the other nine days after. In another case, a terrified patient required admission to a psychiatric unit because he believed both God and the Devil were speaking to him. These hallucinations continued for three consecutive nights, despite treatment with anti-psychotics.[3] [Compare the symptom “Delusion being

alternatively possessed by God and the Devil" recorded for Psilocybe caerulescens!]

The conflicting parts of the psyche may present themselves as God and Devil, or may take another form, as Richard Haard experienced.

Haard [1975] tried six species of Psilocybe and noticed very decisive differences amongst them: "7? *cyanescens* generally lets me look into the order which my inner mind forces on the rest of me; *P semilanceata* is a model builder allowing me to look into the past, present, and future of my life and activities, even into the very nature of life and eternity; *P strictipes* and *P baeocystis* both give a visual adventure, with *baeocystis* the most visual mushroom thus far."

However, using Psilocybe as an inebriant in the Western fashion, rather than with a distinct goal in mind, amounts to giving the mushroom "ally" a free hand, and "this is most dangerous," as Haard found out one evening after eating twenty dried specimens of *P. semilanceata,* despite this being "normally a minimal dose for this weak mushroom." "Much to my surprise and occasional dismay, I was pulled into the heaviest psychic experience I have ever encountered. I was possessed by the mushroom spirit almost as if it sought to teach me a lesson. It now seems that I was drawn into a psychoanalysis, which allowed me to act out my personal conflicts by alternately becoming the conflicting selves and always observing myself at the same time. Something had suddenly appeared out of the creative depths of my mind, something of which I was previously unaware. I underwent an awesome, fear-filled, but enlightening experience. Without respect you may be pulled into a vortex which you have no desire to enter. If you insist on stepping through the door of ecstasy, then prepare yourself with the writing of such people as John Lilly and Carlos Castaneda."

- Altered time and space sense is a general characteristic. Events seem to unfold far more slowly than in real time. Misjudgement of distances is common, making walking and climbing difficult.

- Studies have shown that Psilocybe semilanceata strongly inhibits the growth of the Gram-positive Staphylococcus aureus bacteria.

1-3 Psilocybe Toxicity Information; at:
www.ansci.cornell.edu/1997term/Nolan/psilocybes.html.

NATURE AWARENESS

Psilocybe raises the level of nature awareness ["tree-hugging"] and is best appreciated in a natural environment "because it tends to produce shamanistic, in touch with nature, feelings."

> In my experience, psychedelic mushrooms, such as *Psilocybe semilanceata,* a widespread native species, have the potential, if used carefully with knowledge and awareness, to be useful for developing a sensitivity to the cycles of nature, to learn how we can be in harmony with its processes. The experience can help to guide a receptive person through the often- held attachment of inhabitants of industrial societies to controlling nature, rather than enjoying the stay on mother earth as a caretaker and cohabitant with all the other animals, plants, and living beings.
> I have experienced their healing powers to break addictions, as a catalyst in learning how to eat more healthfully, and even heal specific ailments. Of course, one could say that these feelings and experiences are merely a reflection of my personal nature - that others taking them would experience as many different visions of their usefulness as a healing or enlightening agent as there are people, and this probably true. Yet I have often seen an increased reverence for life and a heightened sensitivity to the beauty and mystery of nature as a common theme among people who have used these mushrooms.
> [Hobbs 1995]

The heightened awareness and appreciation of natures beauties places Psilocybe on one line with two remedies from the plant family Rubiaceae: Coffea and China. The increased colour perception adds greatly to this.

FOCUS

Going into nature also means going inward. Inner terrain is seen in muted light, in contrast to tangible reality, which is best appreciated in bright light. Things are seen in a different light. To cease accommodating to external reality implies that another world comes into focus, a world unfolding somewhere between the extremes of frightening and enlightening.

> The visions I saw were primarily multi-coloured geometric patterns, extremely vivid. They seemed to be originating from the back of my head,

even though I could see them in front of me through open eyes. At the time, I did not know physiology or anatomy, but later, after becoming a nurse, I learned that my impression was correct. The optic nerve ends in the occipital lobe at the back of the brain, so that is where visual images are processed.

The geometric patterns were sharply defined, but if I tried to focus on anything else in the hut my vision [and the visions] became blurred. This was because an effect of the mushrooms is dilation of the pupils. All sense of distance is distorted, whereas only the visions are seen with absolute crystal clarity.

Clinically speaking, when the mushrooms take effect one at first feels nausea, and cold. Basal temperature drops and the pulse slows. There is also a diuretic effect.

My body felt shortened. As I was curious about the effect of the mushrooms on pain, I bit my finger and found I could feel the pressure but no pain.

The visions lasted about five hours, passing all too quickly. Thereafter we slept for a short while.

When I awoke, I felt more rested and refreshed than ever before.

On one occasion, in my visions, I seemed able to hop all over the world. I would come down and alight to visit friends far away. There was a quality of truth about it. However, I told no one, for I did not know what to make of it.

[Masha Wasson Britten - My Life with Gordon Wasson; in Riedlinger 1997]

TRAVELS IN THE UNIVERSE OF THE SOUL

In this description by Rudolf Gelpke of his experiences with psilocybin and LSD, it is easy to recognize the tuberculinic nature of mushrooming, both in the external and in the internal world.

From taking 10 mg psilocybin at 10:20 a.m. on April 6, 1961, Gelpke experiences after about 20 minutes:

Beginning effects: serenity, speechlessness, mild but pleasant dizzy sensation, and “pleasureful deep breathing.”

10:50 Strong! Dizziness, can no longer concentrate .

10:55 Excited, intensity of colours: everything pink to red.

11:05 The world concentrates itself there on the center of the table.

Colours very intense.
11:10 A divided being, unprecedented - how can I describe this sensation of life? Waves, different selves, must control me.
Immediately after this note I went outdoors, leaving the breakfast table, where I had eaten with Dr. H. and our wives, and lay down on the lawn. The inebriation pushed rapidly to its climax. Although I had firmly resolved to make constant notes, it now seemed to me a complete waste of time, the motion of writing infinitely slow, the possibilities of verbal expression unspeakably paltry - measured by the flood of inner experience that inundated me and threatened to burst me. It seemed to me that 100 years would not be sufficient to describe the fullness of experience of a single minute. At the beginning, optical impressions predominated: I saw with delight the boundless succession of rows of trees in the nearby forest. Then the tattered clouds in the sunny sky rapidly piled up with silent and breathtaking majesty to a superimposition of thousands of layers - heaven on heaven - and I waited then expecting that up there in the next moment something completely powerful, unheard of, not yet existing, would appear or happen - would I behold a god? But only the expectation remained, the presentiment, this hovering, "on the threshold of the ultimate feeling." . . .
Then I moved farther away [the proximity of others disturbed me] and lay down in a nook of the garden on a sun-warmed woodpile - my fingers stroked this wood with overflowing, animal-like sensual affection. At the same time I was submerged within myself; it was an absolute climax: a sensation of bliss pervaded me, a contented happiness - I found myself behind my closed eyes in a cavity full of brick-red ornaments, and at the same time in the "centre of the universe of consummate calm." I knew everything was good - the cause and origins of everything was good.
But at the same moment I also understood the suffering and the loathing, the depression and misunderstanding of ordinary life: there one is never "total," but instead divided, cut in pieces, and split up into the tiny fragments of seconds, minutes, hours, days, weeks, and years: there one is a slave of Moloch time, which devoured one piecemeal; one is condemned to stammering, bungling, and patchwork.
One must drag about with oneself the perfection and absolute, the together-ness of all things; the eternal moment of the golden age, this original ground of being - that indeed nevertheless has always endured and will endure for-ever - there in the weekday of human existence, as a tormenting thorn buried deeply in the soul, as a memorial of a claim never fulfilled, as a fata

morgana of a lost and promised paradise; through this feverish dream "prese nt" to a condemned "past" in a clouded "future". I understood. This inebriation was a spaceflight, not of the outer but rather of the inner man, and for a moment I experienced reality from a location that lies somewhere beyond the force of gravity of time.

[Cited in: Albert Hofmann, *LSD: My Problem Child]*

POISONING CASE

On November 16, 1799, a Mr. Everard Brande, a man of rank familiar with the medical profession, sent to the Editors of the Medical and Physical Journal an account "of the deleterious effects of a very common species of agaric, not hitherto generally suspected to be poisonous."[1] This species, which appeared to be a "variety of Agaricus glutinosus", has now been identified as Psilocybe semilanceata, which, like other Psilocybes, has a viscid cap when moist.

J.S. gathered early in the morning of the third of October, in Green Park, what he supposed to be small mushrooms; these he stewed with the common additions in a tinned iron saucepan. The whole did not exceed a saucerful, which he and four children ate the first thing, about eight o'clock in the morning, as they frequently had done without any bad consequence. They afterwards took their usual breakfast of tea etc. that was finished about nine, when Edward, one of the children [eight years old], who had eaten a large proportion of the mushrooms, as they thought them, was attacked with fits of immoderate laughter, nor could the threats of his father or mother refrain him.

To this succeeded vertigo, and a great deal of stupor, from which he was roused by being called or shaken, but immediately relapsed. The pupils of his eyes were, at times, dilated to nearly the circumference of the cornea, and scarcely contracted at the approach of a strong light. His breathing was quick, his pulse very variable, at times imperceptible, at others too frequent and small to be counted. Latterly, very languid; his feet were cold, livid, and contracted.

He sometimes pressed his hands on different parts of his abdomen, as if in pain, but when roused and interrogated as to it, he answered indifferently, yes, or no, as he did to every question, evidently without any relation to what was asked. About the same time the father, aged forty, was

attacked with vertigo, and complained that everything appeared black, then wholly disappeared; to this succeeded loss of voluntary motion and stupor. His pupils were dilated, his pulse slow, full, and soft; breathing not affected. In about ten minutes he gradually recovered, but complained of universal numbness and coldness, with great dejection, and a firm persuasion that he was dying. In a few minutes he relapsed, but recovered as before, and had several similar fits during three or four hours, each succeeding one less violent and with longer intermissions than the former.

[After treatment with tartar emetic, castor oil, and vinegar and water], the father "had a stool, and voided large quantities of urine, and although not perfectly recovered, did not appear to require anything more.

... From the difficulty with which Edward was made to swallow anything, and from the large quantity required, it was eleven o'clock before he had taken enough of the emetic solution to excite vomiting; by this time the poison had produced so powerful an effect upon his system that he did not appear in the least relieved by it. I now ordered him a stimulating injection, applied a blister to his neck, and by degrees made him swallow some small quantities of sal volatile [ammonium carbonate], diluted with no more water than was absolutely necessary.

His feet were frequently rubbed with and wrapped up in warm flannels; in half an hour the injection was repeated; this soon produced stools, when he was sensibly relieved, knew the voice of his father and mother, and complained of coldness and insensibility about his stomach. His whole abdomen was well rubbed before a fire with some camphorated strong volatile liniment, which, at his own request, was repeated two or three times. He continued also to take the sal volatile, and some castor oil. By four o'clock every violent symptom had left him, drowsiness and occasional giddiness only remaining, both of which, with some headache, continued during the following day.

Charlotte, a delicate little girl, ten years old, naturally of a soft mild and tractable disposition, who also had eaten a large proportion, was suddenly attacked in the presence of Dr. Burges and myself, about half after ten, with vertigo and loss of voluntary motion. Her pupils were very much dilated, and sight greatly impaired. These symptoms soon gave place to a degree of delirium, in which she refused to take anything, forcibly striking whatever was offered to her.

A blister was applied to her neck; and having given her a strong dose of the emetic solution, immediately on the first attack, which, though late, operated violently, she became composed as the sickness went off; and

after taking a few doses of the sal volatile, was perfectly well, and wholly unconscious of anything that passed since the commencement of the symptoms. Her pupils, which hitherto had not been much affected, were now irregular and continued so, though in less degree, during the whole day.

1 London Medical and Physical Journal vol. XI, November 16, 1799 [modified from website Entheogen.com].

Symptoms [derived from the above case].

- Laughing immoderately, with indifference to reprimands.
- Answering in monosyllables, yes or no.
- Recognizing; doesn't recognize the voice of his father and mother.
- Refusing to take medicine.
- Striking at anything offered to her.
- Loss of memory; has no recollection of what has happened.
- Delusion he was about to die. Presentiment of death.
- Vertigo & loss of vision.
- Vertigo & loss of voluntary motion.
- Pupils dilated or irregular.
- Coldness and numbness, general [whole body] or local [stomach; feet].

Saprophytic.
God and Devil; conflict
ing parts of the psyche.
World unfolding betwee
the extremes of frighten
ing and enlightening.
Dysphoria - euphoria.
Altered time and space
sense.
Nature awareness; tree
bugging.
Immoderate laughing;
indifferent to reprimand
Coldness and numbness

- Note: Pulford regards Ammonium carbonicum [sal volatile] as an antidote to mushroom poisoning: "It is remarkable ... that Ammonia should relieve the symptoms of poisoning of fungi, and that ammonia should be the characteristic constituent of those growths."

- The above poisoning case also illustrates the belief in vinegar as a suitable antidote.

- The father was convinced that death was near. Dysphoric instead of euphoric reactions are not uncommon with Psilocybe, to the extent that there may be a sensation of impending doom or a presentiment of death.

MATERIA MEDICA

M.S. Bonnet et al. have drafted an excellent materia medica of Psilocybe semilanceata based on human and animal intoxication, including effects of psilocybin.[1] A summary:

Mind

-Aggressive and uncooperative [humans 15.9% of cases, of which 14.3% destroyed surroundings and repeatedly struck own head against floor].
= Feeling of unreality.
“ Euphoria, various degrees [18.5% of cases], with agitation, at times violent, ranging down to somnolence and 14.8% ending in drowsiness.
■» Euphoric, and making fatuous comments [9% of cases].
<·> Fear and fearful of approaching people.
== Fear of death.
== Fear of insanity.
= Frightened [59% of cases, of which 11.5% are crying, 11.5% convinced they are dying and 3.9% want to commit suicide]. Seeing “images of death” or with feeling of being close to death.
= Laughter; continuous gales of laughter expressing elation.
== Pressure of speech [7.4% of cases], while 3.7% talked to themselves; others present with speech restriction.
== Psychomotor agitation, running away haphazardly into dangerous situations [oncoming traffic] or leaving clothes and shoes behind while running naked in public places.
— Restless and hyperkinetic [11.4% of cases].
= Withdrawn, uncommunicative and staring vacantly [9% of cases].

Perception

« Body dysmorphic symptoms [preoccupation with an imagined defect in appearance or excessive concern with insignificant physical anomalies and aesthetic self-absorption, resulting in ritualistic behaviour of an obsessive-compulsive nature] qualitatively and significantly altered and increased; some [14.8%] complaining of apparent swelling of body parts including the tongue.
« Consciousness of time [35.7% of cases] and of space distorted.
= Hallucination, full blown, [9% of cases, of which 50% seeing ghost-like figures and 50% describing brightly coloured animals climbing over their

bodies, others describing birds flying towards them with their beaks agape.

“Heightened awareness of sound [25% of cases, of which 9.1% hearing voices and 9.1% hearing guitar music],

=> Kaleidoscopic phenomena; entoptic phenomena consisting of coloured lights flickering and coalescing to form varying patterns or shadows dancing on wall, some of which perceived as definite [named] persons, objects or animals.

“ Perception of other people becoming fluid bodily and flowing/sliding into impossibly small gaps; or onlookers faces suddenly ageing, becoming wrinkled, drawn, sallow, turning yellow, cream, black and white and vaguely transparent; or other people’s hair appearing flapping and flowing.

“ Reality testing or attempts at holding on to reality during intermittent attacks of panic by clinging, gripping tightly or anchoring self to familiar, solid object, for reassurance and a distinguishing point for what was felt to be real and what was not [28.6% of cases],

» Sexual fantasies [in 3.7% of cases] and many various other fantasies or dream-like states in which it was felt to be elsewhere [fantastic experiences of journeys to the moon or living in fabulous castles].

« Tactile sensation disorders and body image perception, awareness distortions [36.4% of cases, most commonly manifested as tingling or paresthesias of the limbs or face; of which 2.3% feel lips and tongue swelling with a suffocating sensation].

Vertigo

“ Dizziness [43% of cases], slight to moderate, mainly when rising suddenly from prone to sitting or standing.

Reflexes

“Hyperreflexia in deep tendon reflexes [36.4% of cases], brisk and symmetrical, or, only slightly increased tendon reflexes but unilateral and accompanied by mild paresis on same side.

Eye

“ Pupils dilated [in 87-90.9% of cases, of which 27.5% have a sluggish reaction to light and 7.5% are unreactive to light].

Vision

“Vision blurred [LSD-like]; all cases, at least slightly; “everything becomes

misty, as if I am looking into fog."
= Visual disturbances, with lively colours, hazy contours, even with closed eyes; increasing, especially with abnormal visions, undulating of stared at surfaces and coloured formations when eyes closed while observed distances appear falsified and erroneous.
= Visual perception distorted outstandingly, involving distance, depth, size, shape and colour and varying rapidly from moment to moment.
<= Visual sensation of ability to see own body blood and bones or that of others.

Hearing
= Auditory acuity increased.
= Hypacusia [diminished acuity of sense of hearing] or deafness, unilateral.
— Music appreciation increased [even in those who do not appreciate music] [LSD-like],

Face
<= Flushing of the face and neck [18-28.6% of cases].
~ Paraesthesia affecting left side of face.

Mouth
= Dryness of mouth.
=» Food feels coarse and gritty in the mouth.
■» Labial paralysis.
= Yawning, persistent [21.4% of cases, of which one third was accompanied by drowsiness and two third were not].

Abdomen
® Abdominal pains, transient [in 11-21.4% of cases], complaining of cramping, tightness, and fullness, in the lower abdomen with 7% describing the pain as extending to groin and another 7% with the pain radiating into the base of penis and scrotum.

Urinary
= Incontinence of urine [9% of cases].
= Difficulty in starting to urinate [7% of cases] and in passing urine in public toilet.

Chest
- Flushing and patchy erythematous eruption on upper trunk, short lived [18% of cases].

Extremities
“Numbness and tingling in extremities in 35.7% of cases and 7% describing it as “warm, pleasant tingling in arms and legs like one experiences before an orgasm.”
« Stiff feeling and unpleasant sensation of swelling in the limbs.

1 Bonnet M.S., Basson P.W. & Bonnet D.L., *The toxicology ofPsilocybe semilanceata, The liberty cap.* Homoeopathic Links 4/02.

11. FAMILY TRICHOLOMATACEAE

Armillaria mellea
Lentinula edodes
Omphalotus illudens
Pleurotus ostreatus

ARMILLARIA MELLEA

Armi-m.

Scientific name	Armillaria mellea (Vahl) Kummer 1871.
Synonyms	Agaricus melleus Vahl 1790.
	Armillariella mellea (Vahl) P. Karsten 1881.
Common names	Honey Mushroom. Honey Tuft. Shoestring Root Rot. Bootlace Fungus.
Family	Tricholomataceae.

FEATURES

- Cap convex when young, becoming nearly plane with a dark central disc covered with fine hairs or scales.
- Cap light honey-yellow, yellow-ochre, yellow-green or rusty brown to brown.
- Gills whitish at first, then pinkish brown; gets rusty spots with age.
- Thick whitish collar or ring around upper part of stem. *[Armilia* means 'ring'; *mellea* refers to the colour of honey.]
- Stalk tough, often long, with white stringy pith inside.
- White flesh; white spores.
- Taste unpleasant, acrid; bitter, burning. Edible when cooked, considered delicious by many.
- Smell has been compared with that of Camembert cheese.
- Lives on dead trees or on the coarse roots and lower stems of conifers and deciduous trees.
- Appears in dense clusters soon after the first autumn rains with continued fruiting through mid-winter.
- Widespread in relatively heavy soils of cooler parts of temperate zones.

• As one of the most variable of the fleshy fungi, A. mellea actually comprises a complex of at least 11 genetically distinct species, some of which are saprophytic and others parasitic.

PARASITIC SYMBIONT

• The Report on Plant Disease No. 602, March 2000, University of Illinois, states that Amillaria attacks about 700 species of mostly woody plants. Herbaceous plants that are susceptible include blackberry, flowering bulbs, potato, raspberry, and strawberry. Among shade and ornamental trees, oaks and maples are the ones most commonly infected. Woody plants that have previously been weakened by drought, flooding, poor drainage, frost, repeated defoliation by insects or diseases, other poor soil conditions, excessive shade, polluted air or other chemical injury, or mechanical injury are most susceptible to attack.

The most noticeable external symptoms are premature autumn colouration and leaf drop, stunting of growth, yellowing or browning of the foliage, thinning of the crown, a general decline in the vigour of the plant, and twig, branch, and main stem dieback. Overall it resembles premature old age in humans. Often a heavy crop of fruits [berries, cones; known as 'stress cones'] precedes death. [Can this be considered as similar to the repertory rubric, "Unusually well, then aggravated"?] Severely infected trees exude resin, gum, or a fermenting watery liquid from the lower trunk. By the time a tree or shrub wilts and dies, the trunk is usually encircled by the fungus.

Whilst the fungus can be of considerable importance in the final death of weakened trees and shrubs by cutting off their supply of water and nutrients, it is of vital importance to certain plants such as orchids. For example, Armillaria mellea acts as a *mycorrhizal* fungus to support the growth of the non-chlorophyllous orchid Gastrodia elata.

The fungus produces coils in the cells of the orchid tubers and the orchid as a source of nutrients digests these coils. The underground tubers of Gastrodia moreover lack the rootlets that normally gather up nutrients and so rely, instead, on the mycelia of Armillaria to do this. In some cases the fungus acts as a nutrients-supplying bridge between the orchid and tree roots by means of its rhizomorphs.

Association with the fungus is essential to the well being of Gastrodia. When no union takes place, the orchid fails to flower and the newly formed tubers fall off in size. The tubers are so much weakened that they are unable to give

rise to a fresh crop, and the plant dies. Tubers associated with rhizomorphs, on the other hand, produce offsets, which remain dormant during the winter and develop flowers in the following summer.
Entanglement with Armillaria results for most plant species in starvation and for a few others in potency and vigour. The fungus appears to strangle or to strengthen.

SHOESTRINGS

• A distinguishing feature of Armillaria are the black shoestring like mycelial strands [rhizomorphs], by which it both travels throughout the host tree, ultimately girdling it, and advances through the soil at a rate of up to three metres per year.
The rhizomorphs form an extensive, invasive, aggressive network and give the fungus astonishingly wide host ranges which extend far beyond forest trees. The rhizomorphs function as units and grow much faster than the normal hyphae of Armillaria - up to 2 cm per day in laboratory conditions - and they translocate nutrients to the tips from a food base [e.g., a colonised stump] that can be several metres away.
By means of a combination of mechanical pressure and the secretion of an adhesive, gelatinous substance the rhizomorphs penetrate and infiltrate root systems. Little is known about the factors that regulate the growth of rhizomorphs, but the initiation of rhizomorphs in culture is strongly enhanced by low-molecular-weight alcohols such as ethanol and propanol. [Interestingly, Honey Mushrooms if not well-cooked or *when consumed with alcohol,* may cause nausea, meteorismus, vomiting, and diarrhoea. The latter is reflected in the German name for the fungus, *Hallimasch,* which is said to be a contraction for "Hell im Arsch."]
[From: http://helios.bto.ed.ac.uk/bto/microbes/armil.htm]

BIOLUMINESCENCE

• Another notable factor of Armillaria is bioluminescence. It emits cold light in the portion of the spectrum stretching from about the middle of the yellow region through the green and well into the blue. Known as "foxfire," "will-o'- the-wisp, ' or "faerie fire," a soft glow of light comes from chunks of rotting wood and old stumps in moist woodland areas as the weather cools in the autumn. Bioluminescence is not unique for Armillaria; more than 40 other

species of fungi have been identified as luminescent. Armillaria's light is produced by the mycelium and rhizomorphs.
The light is a sign of vigour since its most actively growing and respiring cells generate the glow. One author has it that "it lights up to celebrate its nuptials and the emission of its spores." The luminescence can last in one piece of wood for up to 8 weeks while it remains damp and until essential resources are consumed. Rhizomorphs that stop growing or enter a resting period also stop producing light. The optimum temperature for Armillaria bioluminescence is 25° C. Light generation is noticeable as low as 1° C. Light generation declines rapidly and stops above 30° C. Maximum light is achieved under acid conditions [pH 5.7 - 6.0], Presence of the ammonium form of nitrogen allows for more energy to be released as light. Armillaria bioluminescence has a daily light intensity rhythm with maximum intensity around 7:30 p.m. and a minimum intensity around 7:30 a.m.
Emission of light stops in nitrogen, hydrogen, ether, and chloroform. Soldiers in the trenches during the First World War used to attach pieces of rotting wood to their helmets to avoid colliding in the dark or when in the proximity of explosives, and in the Second World War the firewatchers in timber yards covered brightly glowing wood with tarpaulins for fear that enemy aircraft would spot it. Called touchwood, it was used during the long dark winters of Scandinavia as a marker of forest paths.
[Kim D. Coder, *Foxfire: Bio luminescence in the Forest*, www.forestry.uga.edu/warnell/service/library/for99-021 /]

THERAPEUTICS

• According to Hobbs, Armillaria mellea is used to improve vision and counteract opthalmia and night blindness [due to vitamin A content] and to prevent respiratory and digestive tract conditions. It increases blood flow to the brain and heart without increasing blood pressure. It decreases heart rate, reduces peripheral and coronary vascular resistance, is sedative, anti- convulsive and protects against ionizing effects of radiation.
Antibiotic action against Staph, aureus, Bacillus cereus, Bacillus subtilis. Anti-tumour activity.
Cardiac and vascular - Decreases heart rate, reduces peripheral and coronary vascular resistance, increases cerebral blood flow, increases coronary vascular efficiency without altering blood pressure.

• The orchid Gastrodia elata is listed in Traditional Chinese Medicine as a superior herb that protects health and prolongs life. Its medicinal components recently have been found to be mainly the metabolites of the Armillaria fungus. Hence the fungus can be used as a substitute for the orchid. It has been shown that Gastrodia tuber, synthetic gastrodin [active component], and Armillaria mycelium all possess similar pharmacological activity, mainly reducing spasms and mild sedative effects. Clinically, all of these are used for the treatment of headache, hypertension, tinnitus, dizziness, and other disorders defined by the traditional TCM category as stirring of internal wind and agitation of liver yang.

"The New Drug Group of the Chinese Academy of Medical Science in Beijing has confirmed reports from others centres that Armillaria fermentation liquid could achieve effects similar to Gastrodia; for example, it could alleviate dizziness symptoms caused by various pathological factors [hypertension, insufficient blood supply via the vertebral basal artery, Meniere's syndrome, vegetative nervous functional disturbance]. Numerous other studies have since then confirmed its effectiveness in improving numbness of limbs, insomnia, tinnitus, epilepsy, vascular headache, and post-stroke syndrome." The use of Gastrodia tuber extract by intramuscular injection gave similar results as Armillaria orally in 250 mg/tablet in the treatment of vascular nervous headaches. Of 52 cases treated, the effectivity rates were 83% and 81% respectively.

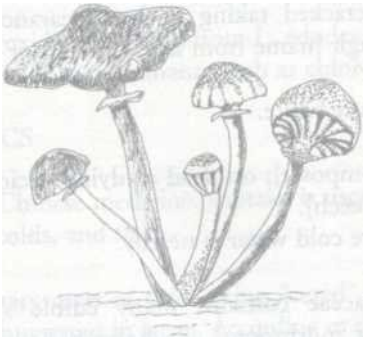
[Subhuti Dharmananda, *Modernizing Chinese Medicine: The Case of Armillaria as Gastrodia Substitute;* at: www.itmonline.org/arts/gastrodia.htm]

• In "Review of Clinical Applications for Gastrodia Tuber, Armillaria Fermentation, and Armillaria Fungus Mycelium," Dharmananda refers to a report of the Central Hospital of Shanghai Jingan District as indicating that one could successfully use Armillaria fungus tablet for treating hyperlipemia in patients with hypercholesterolemia.

"There were 43 cases treated, showing a serum cholesterol decline of 48 mg% on average after treatment; the effective rate was 83%. In patients with elevated triglyceride, the triglyceride value declined by 42 mg% on average after treatment; the effective rate for lowering triglycerides was 75%. In addition, the systolic pressure and/or diastolic pressure of 86% of the patients showed various degrees of decline, while dizziness, oppression in the chest, nervousness, and other symptoms of hypertensive syndrome also improved."

EXPANSIONISM

• Species belonging to the Tricholomataceae family, such as Armillaria, have earned themselves the reputation of fungi favouring expansion of territory. Yet one might wonder if the common name of Tricholoma flavovirens, “Man On Horseback,” has anything to do with wanderlust, since, as Arora says “it doesn’t look anything like a horse, and most of the horseback riders I see are women.” As a member of the family, the allied species Lentinus lepideus has contributed strongly to the reputation. Soon after railroads began to spread across the American continent, Lentinus lepideus became a particularly troublesome fungus.
It demolished in record time the wooden cross ties [sleepers] and managed even to destroy ties made from evergreen timber treated with creosote. Some train derailments were blamed on the activities of the fungus and have given it its common name, “Train-Wrecker.” The U.S. Department of Agriculture was so concerned that for several years it banned the import of the related shiitake mushroom [Lentinula edodes] for fear of the damage it might also cause. Because shiitake is a more peaceful type, the USDA has since relented, resulting in its commercial expansion instead. It is now being grown commercially in North America and is sold fresh or dried in many markets and specialty shops. Kits termed “shiitake logs” are even available for domestic cultivation.



Armillaria mellea

LENTINULA EDODES

Scientific name	Lentinula edodes (Berk.) Pegler 1976.
Synonym	Agaricus edodes Berk. 1878.
	Lentinus edodes (Berk.) Singer 1941.
Common names	Shiitake. Oak Mushroom. Golden Oaks.
Family	Tricholomataceae.

KEYS

- Saprophytic.
- Tough, pliant, as old leather.
  Prefers forest shade where cold water is nearby.
- Growth stimulated by vibration.
- Manganese and zinc.
- Neutralises environmentally persistent pesticide contaminants such as cnlorophenols and dioxins.
- Lowers level of total cholesterol.
- Shiitake dermatitis [flagellate skin lesions], resembling effects of self-flagellation.
- Dermatitis < sunlight.

FEATURES

- Cap umbrella-shaped, spongy, dark reddish brown when young, becoming lighter with age. 6

’ SP ï35 ?ne ^hhe threadlike tufts or scales> especially toward the edges.

- ς π du CaP becomes cracked> taking on the appearance of old leather.
- Stalk short and very tough [name from *lentus,* tough or pliant]; centrally attached to cap. 7
- Gills off-white; spores pure white.
- Spring and fall.
- Saprophytic [wood decomposer]; on dead or dying deciduous trees [oak, maple, alder, chestnut, beech].

Prefers forest shade where cold water is nearby.

The family Tricholomataceae contains many edible species, such as Heurotus ostreatus [oyster mushroom], Tricholoma flavovirens [man-on- orseback], Armillanella mellea [honey mushroom], Armillaria ponderosa

[white matsutake, renamed as Tricholoma magnivelare], Marasmius oreades [fairy ring mushroom], Clitocybe nuda [blewit], and Lentinula edodes.

• Shiitake has been bandied about in different genera; it has been called *Cortinellus edodes, Cortinellus shiitake, Armillaria shiitake,* and *Tricholomopsis edodes,* but more recently it has been regarded as a *Lentinula.* The name *shii* applies to an evergreen tree, *Castanopsis cuspidata,* on which it grows; *take* means mushroom. Shiitake, named *Xiang-gu* in China, is widely used in oriental cuisine and said to be the third most popular culinary mushroom in the world [after the white button mushroom, Agaricus bisporus, and the oyster mushroom].
For 2,000 years the Japanese and Chinese have cultivated it by boring holes in recently cut logs of oak, hornbeam or chestnut, soaked in water, and inoculating them with pieces of wood decayed by the fungus. The logs are hammered or vibrated from time to time to stimulate mycelial growth, a practice known since the 14th century, when logs were beaten with a club to "wake up" the fungus. The fruiting bodies start to appear between 6 and 18 months later.

• Shiitake is high in potassium, iron, copper, niacin, vitamins A and C, and B vitamins - Bl [thiamine], B2 [riboflavin], Bl2. In sun-dried form, it contains vitamin D. Four or five mushrooms irradiated with sunlight equal the daily-recommended allowance of 400 international units of vitamin D. [Among other of the higher fungi that have been found to contain vitamin D are Agaricus campestris, Gyromitra esculenta, Boletus edulis and Cantharellus cibarius.] The stem is rich in manganese and zinc.

• Manganese peroxidases isolated from L. edodes neutralise environmentally persistent pesticide contaminants such as chlorophenols and dioxins!

THERAPEUTICS

• In traditional Chinese medicine, shiitake is used to treat high cholesterol, atherosclerosis, colds, and flu.

Contemporary cases of colds being "cured" when shiitake is taken are reportedly numerous in Japan. According to the late Kisaku Mori, former head of the Mushroom Research Institute of Japan, shiitake was regarded

as a cure for colds during the Ming dynasty some six hundred years ago. But it wasn't until the 1960s that medical researchers began to ask why.

> As early as 1966, Kenneth W. Cochran and colleagues at the University of Michigan at Ann Arbor discovered that shiitake could produce a highly significant level of protection against a type A influenza. Type A flu viruses are the ones that create major outbreaks and can become epidemic and even pandemic, spreading from continent to continent. With the injection of a "crude" mushroom extract, the average number of lung lesions in mice in the wake of flu infection decreased by 46%. The clinically proven anti influenza drug amantadine hydrochloride produced a comparable 40% score.
>
> Later evidence showed the anti-influenza action could partly be attributable to shiitake's spores. Made up into a water extract, the spores proved more active than the mushroom. Besides the stem and cap, in smaller amounts, the particle-sized spores also showed up in the mycelium, even after heat treatment to 33 degrees C [91 degrees F.]. This research was taken deeper when the active part of the spores was isolated and it was found that they held, of all things, "virus-like particles" similar in structure to an influenza virus.
>
> The discovery that these particles had induced the body's own production of interferon - a powerful protein component of the immune system that literally interferes with viral reproduction - and in amounts sufficient to protect against influenza, inspired much more intensive research. When extractives from the virus-like particles consisting of double-stranded RNA were used, anti-tumour effects were found as well. The effect was stronger than that of an interferon-inducing drug known today as Ampligen [polyribonucleotide], but the spore products were never developed into a drug, probably because the amount of interferon induced by Ampligen is four times that of the mushroom RNA.
>
> [Jones 1995]

• Reproducible effects of shiitake in lowering the level of total cholesterol have been demonstrated.

• The use of a broth of shiitake *stems* as a cure for liver ailments and diabetes by the ancient Chinese is probably attributable to the high *zinc* content of the stems. Among the functions of zinc in the human body are insulin activity and maintaining healthy liver function.

• Japanese and Chinese researchers claim that lentinan, a polysaccharide isolated from the shiitake mushroom, is helpful in the treatment of cancer, heart disease, high blood pressure, and diabetes. Modifying the activity of the immune system, lentinan has been used successfully to treat stomach cancers. Another well-studied preparation with proven pharmacological effects is LEM, Lentinula edodes mycelium, which is harvested before the cap and stem grow. In Japan, lentinan is classified as a drug, whereas LEM is considered a food supplement.

> Laboratory tests seem to point to an important role of the adrenal-pituitary axis and central-peripheral nervous system, including serotonin, 5HT, histamine, and catecholamines in lentinan's antitumour activity [Maeda et al, 1974],
> ... In Japan, lentinan is often used to help support immune function in cancer patients during chemotherapy [for instance cyclophosphamide], often leading to increased survival times. It is well known that such chemotherapeutic agents can lead to severe immune suppression.
> ... Lentinan does not attack cancer cells directly, but produces its antitumour effect by activating different immune responses in the host. This activation was at first thought to occur only in immune-compromised animals, but not in healthy animals and was called an immunorestorative agent, but recent work has uncovered a true immunopotentiating effect, by showing a clearly augmenting effect on the proliferation of peripheral mononuclear cells from healthy human donors, which is also supported by animal studies [Aoki, 1984].
> ... Lentinan works through both humoral and cell-mediated immune mechanisms to support host defence against various cancers, bacteria [tuberculosis], viruses [such as the AIDS virus], and parasites [Aoki, 1984; Mizuno et al, 1992].
> ... Lentinan may also be useful in clinical practice for strengthening immune and endocrine functions of elderly people and people who are run-down from overwork, as well as the prevention of cancer in high-risk individuals, both orally and by injection [Aoki, 1984]. In Japan, in the treatment of low natural killer cell syndrome [LNKS], a disease which appears to be identical to chronic fatigue syndrome in the West, lentinan was successful in reversing the symptoms of remittent fever, persisting fatigue, and low NK cell activity [Aoki et al, 1987]. [Hobbs 1995]

CLINICAL MANIFESTATIONS

• No toxic effects have been reported, only "minor" side effects or allergic reactions [due to its histamine-sensitizing properties], including diarrhoea and "numerous cases of shiitake dermatitis." "In a phase II trial, only 17 of 185 patients with advanced cancer had similar transitory side effects. Skin eruptions were noted in seven cases, mild oppression on the chest, six cases, and mild liver dysfunction, four cases.
In a follow-up phase III trial by the same researchers, 15 out of 275 patients experienced nausea and vomiting [2], heaviness in the chest [4], heat sensation [2], and one case each of face flushing, a rise in blood pressure, and heaviness in the head." [Hobbs]

• A cholesterol-lowering study with shiitake showed that 17 of 49 participants withdrew because of rash or abdominal discomfort, and two had marked eosinophilia.* One of these latter participants was subsequendy challenged for 14 days with shiitake powder and again had eosinophilia. At the Mayo Clinic, Rochester, USA, it was subsequently investigated whether ingestion of shiitake mushroom powder induces eosinophilia or symptoms. Ten normal persons ingested 4 grams shiitake powder daily for 10 weeks and again after 3 to 6 months. Five participants showed "increased blood eosinophils, serum major basic protein, stool eosinophil-derived neurotoxin, and factors that enhanced eosinophil viability." These results led to the conclusion that "daily ingestion of shiitake mushroom ... provoked blood eosinophilia, increased eosinophil granule proteins in serum and stool, and increased gastrointestinal symptoms." [A.M. Levy et al., Eosinophilia and gastrointestinal symptoms after ingestion of shiitake mushrooms; J Allergy Clin. Immunol. 1998 May; 101 (5) :613-20; website PubMed]

• People taking anticoagulant medicines are advised against consuming Shiitake beyond occasional use in foods since the mushroom has been reported to hinder blood coagulation.

• Shittake dermatis is characterised by *flagellate skin lesions,* so called because they resemble the effects of self-flagellation prevalent in mediaeval times. The lesions consist of oedematous, erythematous streaks occurring in a centripetal distribution over the trunk and proximal extremities and have alternatively been described as 'linear streaks' and 'zebra-like stripe erup-

tion.' Photosensitive skin lesions on exposed areas are an accompanying factor. Analysis of the case histories of 94 Japanese patients with shiitake dermatitis has shown that 47% also developed dermatitis on the skin exposed to sunlight. It has been observed, in addition, that flagellate dermatitis is not rare as a drug eruption following bleomycin therapy. [Bleomycin is an antibiotic, derived from Streptomyces verticillus, used in the treatment of cancers.]

• The shiitake is a forest fungus that prefers shady places. It inhabits cool temperate regions. The logs on which it is cultivated are left in shady parts of the forest or shaded forest conditions are artificially simulated. Its contents, particularly the lentinan, decrease markedly at temperatures higher than 20° C. In this context it is striking that the dermatitis evoked by eating shiitake, in sensitive persons, is aggravated by exposure to sunlight.

* Eosinophils: type of white blood cell, containing cytoplasmic granules easily stained by eosin; produced in the bone marrow and normally found in the bloodstream and the gut lining. The production of eosinophils is stimulated by the release of interleukin-5 by T cells, mast cells and macrophages. [Lentinan, the polysaccharide complex contained in shiitake, is stated to stimulate the production of T lymphocytes and macrophages, specifically interleukin.]
Common causes of eosinophilia include allergic diseases [asthma, hay fever], skin diseases, medicine reactions, and parasitic infections, and, more rarely, certain tumours, e.g. lymphoma, and some antibody deficiencies. Eosinophilia due to asthma is marked by symptoms such as wheezing and breathlessness, whereas parasitic infections may lead to abdominal pain, diarrhoea, fever, or cough and rashes. Medicine reactions often give rise to skin rashes, and they often occur after taking a new drug. Rarer symptoms of eosinophilia can include weight loss, night sweats, lymph node enlargement, other skin rashes, and numbness and tingling due to nerve damage.

Saprophytic.
Tough, pliant, as old leather.
Prefers forest shade where cold water is nearby.
Growth stimulated by vibration.
Manganese and zinc.
Neutralises environmentally persistent pesticide contaminants such as chlorophenoh and dioxins.
Lowers level of total cholesterol.
Shiitake dermatitis [flagellate skin lesions], resembling effects of self-flagellation.
Dermatitis < sunlight.

MATERIA MEDICA LENTINULA EDODES

Sources

Provings conducted in India [Chetna Shukla, 4 provers], New Zealand [Pratibha Dalvi, 5 provers], and Sweden [Frans Vermeulen, 5 provers]; 13 females, 1 male; 30c; 2004.

SYMPTOMS

Mind

<■ Responsibility/ No responsibility - Neck and Shoulders [4 pr.]

« I had no responsibility for taking the decision and this freed me of the guilt I would have otherwise had if I had to take this decision.

« I felt all the responsibilities are 'thrust' on me! I felt no one is there to shoulder them. I felt only I am doing anything.

= I feel that I am not capable of taking responsibility.

= I sit for minutes doing nothing, nothing in fact - no thinking too. I am not lost, but I am just sitting still. It is a state of no activity - in body and mind!

«· It is not that I want to avoid or run away from housework, but it is the feeling to put my [medical] qualifications and intellectual capabilities to good use!

«■ I have become very regular and consistent with all my responsibilities towards myself. I feel I am good in my work and I do it well and that is why everything is going well. I was always the kind who would do something with enthusiasm for a few days and than forget all about it. But for the last three weeks I am daily doing my Yoga exercises early in the morning. However late I have slept in the night I wake up and do the exercises and only than start my day. I feel committed to myself.

= I get negative thoughts in the morning on waking up. I feel always I cannot do it. I don't feel like waking up. I feel tired and want to sleep still. I get thoughts about this work I won't be able to do.

AS IF BEING PULLED FROM ALL DIRECTIONS AT ONCE

« I felt as if I my space was being encroached upon. As if I wanted to come home after a good day and chill out and enjoy talking with hubby but I was being pulled from all directions at once. Do this. Do that. I need

you. I wanted to say — What about me. F*** you all. Leave me alone! I wasn't allowed to be me. I had to be everything for them as well.

DETERMINATION - IRRESOLUTION

= I never was in two minds like usually - should I ask him permission, ask him for a yes or a no whether to do it or not.

= For any decision I say 'let's throw chits' - we will decide by throwing two chits labelled 'to go' and 'not to go' at the foot of the lord and then you choose one. I wanted my destiny to be decided by a piece of paper.

HEAVY TO CARRY [3 pr.]

= It was as if the weight of the head was more than I could carry. I was conscious that I was carrying my head on my shoulders. The head feels too heavy for the shoulders.

» [5 min. after taking remedy] ... Felt quite heavy in head and body, esp. head. I slumped. Felt as if I needed to hold my head up. Then it went to my muscles and shoulders, which felt heavy.

= Woke up in the morning with a very sore neck and shoulders. Slighdy stiff and very sore. Aggravation from movement. Wanted the shoulders to be rubbed.

® Identity.

HIDING IDENTITY [2 pr.]

= I was travelling by train and [unlike me] I started a conversation with strangers [co-passengers]. And when one of them asked me what I do I said, "I do nothing, I am a housewife". I don't know why I wanted to hide my identity as a homeopath.

<■ In the evening I hired a rickshaw to go to the hospital. The driver asked me while I was getting down if I were a doctor in this hospital. I said, "No, I am not. I have come here to visit a patient." I hid my identity that I was a doctor. I don't know why.

NO IDENTITY OR PRIVACY

~ [DREAM of being in a hospital]. ... I felt like an observer one minute - looking at the scene from a distance, an out of body feeling - and then the need for a bodily function brought me back into myself. But I had trouble having a bowel motion because there was no privacy and I felt that my individuality had been taken away. Then the feeling of being

the observer took me out of myself, then back again with the awful thick, sticky gagging feeling in my mouth. The nurse tried to stop me retching, saying I was not to do that. ... I was so pleased when I woke as the dream left me with such an unpleasant feeling. It was as if I had no identity or privacy.

THERE AND NOT THERE [2 pr.]

" Sensation of being removed from the situation although I am part of it. It was as if the lecturer was there but not really there. As if watching from another perspective even though I was in the room as well. Not out of body.

= Feel fragile - as if surrounded by a delicate film and looking through it. " Fleeting sensation of separation from self.

" Sensation as if time were moving slowly in the morning.

=> Dreams of the dead.

" I have been getting a lot of dreams. One I remember, in it I was an Aatma' [spirit] and I was standing in a group with a lot of people and I am not aware that I am an Aatma; someone makes me aware that I am one. It means that I am dead. I also have been seeing a lot of dying scenes. I saw a dead puppy, and a dead rat.

Generals

=· Thirst. [3 pr.]

I have been exceptionally thirsty. So dry that it feels as if my throat is closing over in the first week of the proving.

" Pain in spots. [2 pr.] Like a finger poking hard in a spot.

" Upward drawing sensation [cranium; genitals].

— Perspiration - profuse, non-offensive. [Another prover had offensive smelling sweat in the armpits.]

" Desire for spicy food and sweets.

= *Reduced* craving for onions/ garlic and fats. [2 provers; curative response]

" Craving for coffee, but it causes nausea and sudden urging for stool with diarrhoea.

= Misjudgement of distances.

My movements are completely uncoordinated. I bump against things with the bicycle although I have been biking there many times before; I knock against a basket in the shop; bump when entering a train; and always with my right side, as if I misjudge the distance or as if my body is thinner on the right-hand side. I leave more space on my right-hand side than I actually need.

Locals

<= Sitting on a chair, feel as if going to fall to the left, desire to get up and move.

« Feeling as if right eye is lower than the left; then as if left eye moves forward in socket, then the other.

<= Dry mouth and throat - must get up in the night to drink.

- Obstruction nose - changing sides. [2 pr.]

= Mucus keeping lodging in back in throat, must cough to clear it.

= Lumpy feeling in throat on empty swallowing, > drinking warm water.

« Suffocating sensation from feeling as if something were stuck in throat, with asthmatic-type of shortness of breath, when lying down in bed; > sitting up.

- Stomach pain and nausea, coming on between 3-4 p.m.; < drinking.

<= Loud flatulence and loose stools.

- Nipples hot and painful to slightest touch [even of clothing].

» Pins and needles in both hands on waking.

= Pain in left knee and ankle, < squatting.

= Icy coldness all over body, except for feet, which are warm.

Skin - hair

<· Hair suddenly greasy; roots of hair and scalp painful.

= Facial skin - cheeks - dry and peeling.

- Desquamation of skin of forehead.

<= Pustular acne on face, esp. forehead.

« Face oily and greasy [prover had to wash face 5-6 times daily].

= Boil on left breast below nipple; sudden onset, painful, slight discharge of pus.

« Skin of legs very dry and scaly.

= Painful callosity at underside of great toe [of left foot]; tender and painful even on soft touch; touch of shoe causes a knife-like pain; must walk with great toe extended upward.

<· Itching eruptions on hands [dorsum] and feet; > washing in water [“just wetting it”].

= Urticaria < morning on waking; < bathing; > ice application.

OMPHALOTUS ILLUDENS **Omph-i.**

Scientific name	Omphalotus illudens (Schwein.) Bresinsky & Besl 1979.
Synonyms	Agaricus illudens Schwein. 1822. Clitocybe illudens (Schwein.) Sacc. 1887. Clitocybe olearia (DC.) Maire 1933.
Common names	Jack O'Lantern mushroom. Copper Trumpet.
Family	Tricholomataceae.

NOTE: Omphalotus illudens and O. olearius are considered synonymous by some mycologists claiming that separation into two species was formerly based on the larger spore size of O. olearius only. However, Bresinsky and Besl, who introduced the name Omphalotus illudens in 1979, do not consider O. olearius (DC: Fr.) Singer as a synonym of this combination. Scientists at Kew Gardens also consider the two species as distinct, although O. olearius auct. Brit, [auctorum Britannicum, British authors] is regarded as the synonym of O. illudens, according to the CABI database.

KEYS

- Saprophytic fungus causing white rot.
- Shades of orange.
- Glows ghostly greenish in the dark.
- Favours warmer regions.
- Emphasis on gastrointestinal disturbances, notably nausea and vomiting.
- Concomitants: exhaustion and sense of being cold.
- Contains cytotoxic compounds with tumour-shrinking properties.

FEATURES

- Wood-inhabiting saprophytic fungus.
- Cap bright orange [like carrots], often with a brownish hue.
- Cap arched with an inrolled margin when young; broadly flat with a funnel-shaped depression in the middle and with a folded sharp margin when mature.
- Stalk somewhat duller orange than the cap.
- Flesh orange, with lighter orange to almost whitish marbling.
- Spores white.
- Gills orange, glowing greenish in the dark.

- Taste mild or somewhat astringent; smell pleasant, oily.
- Grows in large clusters at the base of hardwood stumps or on roots or buried wood. The European form is typically associated with olive trees, while a greenish-orange California variant is associated with oaks.
- Common in warmer regions; summer to fall.
- Easily confused with Cantharellus cibarius [Chantarelle].

GHOSTS AND MOON NIGHTS

To experience the property of shining in the dark of the Jack-O'Lantern David Arora recommends "sitting alone in a dark closet with the mushroom while eating a grilled cheese sandwich. Unless you are a voracious eater, this method helps combat boredom while allowing your eyes to adjust to the darkness. After a few minutes an eerie silvery-green glow will become visible, growing gradually brighter with each bite [of the cheese sandwich] until each gill is clearly outlined." The eerie glow has earned the mushroom the name "Ghost Fungus."
The glow is brightest in the autumn when the mushroom actively sporulates, a period of the year that coincides with the celebration of Halloween in October. Its pumpkin-orange colour enhances its association with Halloween.
Jack-O'Lantern's bioluminescent Asian counterpart, Lampteromyces japonicus, is popularly known in Japan as "Moon-night Mushroom." The luminescence is caused by sesquiterpenes called *illudins* [lampteroflavins when derived from Lampteromyces].

CLINICAL MANIFESTATIONS

Has been shown to be "muscarine-positive" in tests on laboratory animals, producing salivation and lachrymation, but does not seem to have major muscarinic overtones in cases of human poisoning.
Acts as a strong emetic, usually without typical muscarinic symptoms such as diarrhoea and sweating. The primarily emetic effects suggest, according to Benjamin, "a more direct effect of the absorbed toxins on the vomiting centre in the brain" rather than the toxins acting as a direct gastrointestinal irritant. Tom Volk offers the scant consolation that "unlike the Death Angel [Amanita phalloides], Omphalotus olearius won't kill you - it will just make you wish you were dead."

Reported effects include:

- Headache.
- Dizziness.
- Disturbance of vision [rare].
- Dryness in the mouth with a bitter taste.
- Numbness around the mouth.
- Dysphagia.
- Nausea and vomiting [70-90% of cases].
- Abdominal pain.
- Diarrhoea [rare],
- Tingling in fingertips.
- Weakness; fatigue; sense of exhaustion [40% of cases],
- Decreased muscle coordination.
- Sleepiness.
- Feeling of being cold.
- Sweating [rare].
- Internal bleeding [rare].
- Recovery usually rapid [within a week] but can be protracted [excessive tiredness for up to a month].

CANCER

Saprophytic fungus causing white rot.
Shades of orange.
Glows ghostly greenish in the dark.
Favours warmer regions.
Emphasis on gastrointestinal disturbances, notably nausea and vomiting.
Concomitants: exhaustion and sense of being cold.
Contains cytotoxic compounds with tumour-shrinking properties.

• Sesquiterpenes and triterpenes are important toxins in this species. Unique to Omphalotus, these terpenoid compounds, *illudins,* are extremely cytotoxic and too toxic for clinical use. Less toxic, semi-synthetic analogues have been developed recently, which are tested in the United States and Europe as anticancer drugs. The illudin derivatives are called acylfulvenes [lampterols when derived from Lampteromyces], one of which, irofulven, has demonstrated during phase II and III clinical trials promising tumour-shrinking effects in pancreatic and ovarian cancers.
The drug is also tested for treatment of hormone-refractory prostate cancer, breast cancer, and tobacco-derived non-small cell lung cancer. Irofulven promotes cell death in malignant tissues; this process is known as “cell suicide” because of the tendency of tumour cells to shut themselves

down automatically when “they sense their function is compromised.”
Side effects from irofulven are comparable to those of other chemotherapy drugs and include bone marrow suppression, nausea, vomiting, fatigue, anaemia, phlebitis, visual disturbances, facial erythema, reversible kidney failure, pulmonary oedema [2 cases], and, in one case, acute ataxia. Pending FDA approval, irofulven is expected to be marketed in the second half of 2003.

PLEUROTUS OSTREATUS **Pleur-o.**

Scientific name	Pleurotus ostreatus (Jacq: Fr.) Kummer 1871.
Synonym	Agaricus ostreatus Jacq. 1774.
Common names	Oyster Mushroom. Tree Oyster. Hiratake.
Family	Tricholomataceae.

KEYS

- Saprophytic white rot fungus growing on dead standing trees or fallen logs.
- Favours cool weather; may fruit in winter during thaw.
- Carnivorous; anthelmintic.
- Cholesterol; chronic use of alcohol.
- Building blood cells or destructive to blood cells.
- Muscle inflammation, pains or cramps.
- Warts.

FEATURES

- Saprophytic oyster-shell-shaped brackets forming overlapping shelves or clusters on dead deciduous trees, stumps or logs [especially beech, cottonwood, oak, and orchard trees]. Uncommon on conifers.
- Cap deep brown to bluish black when young; white to greyish-brown with age.
- Surface smooth; margin lobed to wavy.
- Flesh white; gills white [yellowish in age]; spores white [or tinged lilac].
- Stem absent or very short and thick, with dense white hairs at the base.
- Odour of anise or liquorice. Flavour increased by cold weather.
- Abundant in summer and fall throughout the northern temperate zone.
- Favours cool, moist weather, tolerating surprisingly low temperatures. May appear during thaw in winter. Member of the “Fog Flora.”
- Edible and highly favoured by many.
- Easily cultivated [domesticated], hence present on many supermarket shelves.
- Charles Mcllvaine praises its culinary virtues as: “Its very name implies excellence. The camel is gratefully called the ship of the desert; the oyster mushroom is the shellfish of the forest. When the tender parts are dipped in egg, rolled in bread crumbs, and fried as an oyster they are not excelled by any vegetable, and are worthy of place in the daintiest menu.” Extending his praise to the genus Pleurotus, he writes: “If any odium attaches to the word

toadstool, it should be forgotten and forever banished in the presence of this cleanly, neat, handsome genus, choice in its growing places from lichen-covered stumps, or bark-clad boles, or highly perched limbs, or the scented surfaces of decaying wood. Several of its species perfume themselves throughout with pleasant spicy odours. Many are most accommodating in their constant coming." In short, the gendeman amongst the mushrooms.

- Pleurotus spp. are good candidates for bioremediation applications, such as soil decontamination, degradation of industrial dyes, phenols, and wastewater treatment.

PREYING ON WORMS

- Pleurotus species are primary colonizers of dead wood. Wood is a good source of carbon but notoriously deficient in nitrogen. Nitrogen is essential for making proteins. Pleurotus has found an interesting solution for this problem. It supplements nitrogen by trapping nematodes, tiny roundworms or threadworms that are very abundant in wood and soil. On attempting to eat the mushroom's mycelium the nematode gets stuck in adhesive knobs on the hyphae, in the same fashion as a fly gets caught in a spider's web. Pleurotus then secretes an acid substance [tricholomic acid] that rapidly inactivates the nematode. Next, the hyphae enter the nematodes mouth and anus, colonizing its body and digesting it from the inside, so providing the fungus with the nitrogen it needs. The potent nematotoxin suggests that Pleurotus possesses anthelmintic properties when used medically. [Ascaris lumbricoides, for example, is a parasitic nematode infesting the small intestines of mammals.] Bacterial colonies are also preyed upon, which might explain the antibacterial activity exhibited by the fungus.

The nitrogen supplementation enables the Oyster Mushroom to produce a protein high enough in quality to nearly equal animal-derived protein.

The absence of carnivorous habits in other members of the family Tricholomataceae, such as Armillaria and Lentinula, has resulted in the proposal to place Pleurotus in a separate family, the Pleurotaceae.

CHOLESTEROL

- The Oyster Mushroom is best known medically for its cardiovascular and cholesterol-lowering activity, a property it shares with its close relatives Armillaria and Lentinula. The fungus naturally produces lovastatin and

related compounds, which inhibit the rate controlling enzyme in cholesterol biosynthesis in the liver. It has been shown to totally negate increases in triglycerol levels and liver cholesterol resulting from chronic alcohol ingestion in laboratory animals [hamsters].

An FDA approved drug in a category termed 'statins' lovastatin is used for the treatment of blood cholesterol. Commercially produced by the mould Aspergillus terreus, the drug and its analogues are marketed under brand names such as Mevacor, Mevinolin, Mevinacor, Mevlor, Zocor, Lipitor, or Sivlor. Statins are very widely used, especially in the large numbers of patients with symptomatic atherosclerotic disease or patients who are at increased risk of coronary heart disease.

The main adverse effect of statins is myalgia and myositis, in severe cases resulting in rhabdomyolysis [disease of skeletal muscle entailing its destruction]. Concomitant use of cyclosporine or erythromycin increases the risk of myositis. Other serious unwanted effects include hepatitis and angio-oedema, whilst gastrointestinal disturbance, insomnia and rash are regarded mild side effects. Statins are contraindicated in alcoholism, pregnancy and liver disease.

Leikin and Paloucek [1998] list for lovastatin the following adverse reactions:

- CNS: Headache; psychosis; insomnia.
- Dermatologic: Rash; pruritus.
- Endocrine: Gynaecomastia [excessive development of the male mammary glands].
- Gastrointestinal: Flatulence; abdominal pain; cramps; diarrhoea; pancreatitis; constipation; nausea; loss of taste perception.
- Haematologic: Haemolytic anaemia.
- Neuromuscular: Neuropathy [peripheral].
- Ocular: Blurred vision; myositis.
- Respiratory: Diminished sense of smell.
- Miscellaneous: Systemic lupus erythematosus; hyperthermia; cholestatic jaundice.

HAEMOPOIESIS - HAEMOLYSIS
CREATION - DESTRUCTION

• Besides having a number of allergens, Pleurotus ostreatus contains a toxin, pleurotolysin, that is lytic to red-blooded mammals. Hepatitis, and

haemorrhaging in kidney, liver, intestine, and lung have been reported to occur in animals after oral and intraperitoneal administration of the fungus for 30 days. These findings are consistent with Iraqi reports of toxicity in people.

> The composition of pleurotolysin is closer to the bee venom melittin or the *Staphylococcus* delta toxin than other mushroom lytics. The haemolysis induced by this compound is inhibited by liposomes prepared from cholesterol, by dicetyl phosphate, and by sphingomyelin [a phospholipid]. Other lipids did not affect it. The sensitivity for haemolysis is dependent on the sphingomyelin content of erythrocyte membranes. Sheep erythrocytes, which have a relatively high sphingomyelin content, are less sensitive than those of human, dog, or rat erythrocytes.
> [Spoerke & Rumack 1994]

• Pleurotus may on the other hand be "an excellent blood-builder," suggests Hobbs. "According to published results, it has up to 19 mg/100 gram [dried] of iron. In animal feeding studies, the addition of Pleurotus sajor-caju [the Asian counterpart of P. ostreatus] or P. flabellatus to the diets of anaemic albino rats raised haemoglobin content to 15.5 and 16.2 respectively, which compares with 8.2 for control, which were fed copper and milk. The value was 14.0 in normal rats." Little is known about the functions of iron in fungi. The element appears to serve as a substance modifying physiological activities, not as structural material. Pleurotus seems to be one of the exceptions to the rule that fungi are notably low in iron.

Saprophytic white rot fungus growing on dead standing trees or fallen logs.
Favours cool weather; may fruit in winter during thaw.
Carnivorous; anthelmintic.
Cholesterol; chronic use of alcohol.
Building blood cells or destructive to blood cells.
Muscle inflammation, pains or cramps.
Warts.

THERAPEUTICS

• Chinese medicine employs Pleurotus in the treatment of lumbago, numbness of limbs, circulation problems, and for joint and muscle relaxation. Muscle inflammation and muscle pains/cramps are an adverse effect of lovastatin and the affinity with joints links Pleurotus to melittin, the principal component of honey bee [Apis mellifica] venom, which has antirheumatic properties.

• In Finland it has been found that oral administration of Remasan [standardized product containing 61.2% dried oyster mushroom powder] causes warts to disappear

as well as preventing their reappearance. The product is also claimed to reduce joint pains, growing pains in children, and to regulate diabetes.

TRICHOLOMA SPP.

• Within the large family Tricholomataceae, the genus Tricholoma contains quite a number of bitter, malodorous or acutely poisonous species. During the 1950s and 1960s in Switzerland, Tricholoma poisonings accounted for 20% to 50% of all reported mushroom intoxications, with **Tricholoma par- dinum** [tiger or spotted Tricholoma] as the most notable cause.
An interesting feature of Tricholoma intoxication is the combination of gastro-intestinal and neurological symptoms.
The Czech mycologist Albert Pilat [1961] considers T. pardinum particularly treacherous because it has a very attractive appearance and a pleasant smell and yet is "violently poisonous" although "not fatal." He says that the poisoning is "extremely painful" and that "3 to 6 days pass before the patient is fully recovered." Apparently containing "some very irritating substance which causes sudden inflammation of the mucous membrane of the stomach and intestines," poisoning occurs very rapidly, i.e. in one or two hours after consumption, stomach pains, violent sickness and repeated vomiting, stinking diarrhoea, headaches, cramps in the calves and great weakness set in; the patient brings up both medicine and food." These symptoms usually last 2-6 hours; there are no after-effects. Some patients exhibit signs of anxiety, including sweating.

• **Tricholoma sejunctum** has been considered an edible species in the United States by the unflinching mycophagist Charles Mcllvaine, who found it, cooked, "of good body and peculiar but pleasant flavour." Tastes differ, as do recommendations regarding its edibility. Arora, for one, regards it "insipid at best and poisonous at worst. ' A number of confirmed cases of poisoning observed in Europe in the 1950s and recorded by Pilat, however, appear to endorse the old argument that environmental factors such as the type of substrate influence the levels of particular toxins. Pilat describes several T. sejunctum intoxications, among others, the mild attack of poisoning suffered by his friend, Dr. Sindelka.
After eating the mushrooms Sindelkas "limbs started to feel cold," and dizziness, abdominal pains and great sweating set in." He did not vomit the

food and by the following day the symptoms had disappeared. A true researcher, Sindelka "searched for this mushroom in order to try it out again," resulting on the evening of October 21, 1952, in the consumption of three small specimens as an experiment. "Two to three hours later he had a feeling of uneasiness, irritation and shivering. The symptoms had disappeared by the morning so that his state of health on the second day was quite normal."

The next evening the experiment is repeated, this time by eating a dish prepared from about ten small fruit bodies with an egg and potatoes. "Two hours later he started to feel unwell, sweat and shiver. [One hour later] he went to the doctor where the symptoms of poisoning increased and intense trembling of the legs set in, so intense that the teeth chattered, but he still did not vomit. The doctor gave him an injection to cause vomiting but without effect. In the morning he again felt quite well. Before that he had swallowed a laxative but it took effect only in the morning."

Pilat then describes another case of poisoning, in which there occurred, five hours after consumption of several specimens, "abdominal pains, vomiting and diarrhoea, severe mental depression, enlarged pupils and shivering." After taking during the night about 30 tablets of charcoal, the victim had fully recovered the next morning.

- Tricholoma sulphureum, alias "The Stinker" or "Gas Agaric," is strongly sulphur-yellow in all its parts. It emits a foul odour of coal tar [described by Bresinsky as "an unpleasant smell reminiscent of a mixture of pastries and coal gas"] which renders it unsuitable for the table, as even Mcllvaine had to admit eventually: "No amount of cooking removes its unpleasant flavour. I have tried to eat enough of it to test its qualities, but was satisfied after strenuous efforts to mark it *inedible. "*

Those who manage to put up with the "discouraging smell and the forbidding taste" and get some of the mushrooms down may end up with symptoms in keeping with those of other poisonous Tricholoma's: gastrointestinal upset accompanied by neurological symptoms.

- Rather unpleasant effects can also be expected from members of the Tricholoma pessundatum group, which comprises several closely related, reddish-brown species with a distinct farinaceous odour. Suffering from an acute attack of overconfidence, two men ingested a liberal portion of red- brown Tricholoma and "subsequently staggered through an all-night ordeal of nausea, vomiting, and diarrhoea, in which not only the mushroom, but everything else, was expelled."

Pilat provides a more detailed description of the Tricholoma-ordeal: “In half to four hours after consumption a feeling of sickness starts followed by a desire to vomit. Finally the food is brought up and vomiting occurs ten to twenty times without any relief being obtained.

On the contrary, cramps start in the abdomen and frequent attacks of diarrhoea ensue. Sometimes the diarrhoea begins at the same time as the vomiting, at other times earlier. As with other poisonings of this nature, the blood circulation may be affected and fainting, cold sweat, accelerated activity of the heart and symptoms of loss of fluids [cramps in the legs, etc.] may set in. This latter state, with a feeling of exhaustion and physical weakness may last several days and full health may be regained only gradually. Basically, therefore, these are symptoms showing that the stomach and intestines have been affected.”

- The active principles of most Tricholoma spp. are yet to be identified, although muscarine and tricholomic acid have been mentioned in literature as possible constituents. Tricholomic acid, or dihydro-ibotenic acid, has been isolated from **Tricholoma muscarium,** a species known as “fly-killer mushroom” in Japan, where it is traditionally used as an insecticide. Jonathan Ott has detected tricholomic acid in *Pleurotus ostreatus* and finds it probable that it [also] occurs in the *shiitake* mushroom, *Lentinula edodes,"* since both edible mushroom are classic z/wzzwz-flavoured foods. This is of special interest since Tricholoma, Pleurotus and Lentinula all belong to the family Tricholomataceae.

Ott assumes that tricholomic acid is at least in part responsible for the ‘fifth flavour [apart from bitter, salty, sour and sweet] which the Japanese call *umami,"* an assumption substantiated by the fact that “ibotenic acid and tricholomic acid have been patented in Japan as flavour-enhancers, [both being] structural analogues of glutamic acid, the monosodium salt of which [MSG] is widely used as a flavour-enhancer.” [Glutamic acid was isolated in 1908 from the seaweed Laminaria japonica or kombu . Having no specific flavour of its own, kombu has the magical property of making other ingredients in recipes taste better; hence this unique glutamate quality was named ‘umami’, roughly translated as ‘deliciousness’.]

- Research conducted by Ott appears to indicate that the insecticidal tricholomic acid is a most probable candidate for the neurotoxin employed by Pleurotus ostreatus to immobilize soil nematodes. ‘“While analysing extracts of the oyster mushroom against standards of tricholomic acid in my laboratory in Washington State in October 1984, I observed that both the

Pleurotus extract and the tricholomic acid standard solution attracted and killed flies. After standing open in my laboratory for 24 hours [with a door opened to the outdoors], I counted no fewer that nine dead flies in the *Pleurotus* extract which was found to contain tricholomic acid, and a single fly even squeezed through the tiny opening of the screw-cap vial in which the small amount of tricholomic acid solution was kept, and there met his death!"

Agaricus [Amanita muscaria] in potency also attracts and kills flies. While waiting for a few granules of Agaricus 200c to dissolve in a glass of water, a patient saw three flies, which seemed to appear out of nowhere, dive into the water and drown.

• While **tricholomic acid** does not appear to induce acute toxic effects in humans, its structural analogue, glutamic acid, in the form of MSG [also known as Ve-Tsin or Mejing] has been associated with the so-called "Chinese-restaurant syndrome" in which diners suffer from pressing, vicelike headache, tightness of the jaw muscles, numbness/tingling of the neck, chest and hands, chest pain, nausea, thirst, dizziness, palpitations, anxiety, feelings of warmth and flushing of the skin, and/or cold sweat around the face and armpits for some hours [often 6] after eating Chinese food.

Susceptibility to MSG plays a major role in evoking these adverse effects, as does, at least in part, pyridoxine [vitamin B6] deficiency because pyridoxine is needed by the body to metabolise and remove glutamate. Used to intensify meat and spice flavourings in meat, condiments, pickles, soups, and baked goods, MSG has been reported to cause depression, irritability, and other mood changes. Japanese fermented juices such as Miso and Tamari are rich in natural MSG.

Despite assurances that MSG is safe for human intake, the use of glutamate in baby foods in the United States was voluntarily discontinued in 1970 when it was revealed that the amount of glutamate required to induce damage to the immature brain [500 rng/kg body weight] was not too different from the 130 mg/kg body weight in a 4 1/2 oz jar of baby food. [Maurice Hanssen, *E for Additives]*

• Tricholomic acid might contribute to the anthelmintic properties of Tricholoma matsutake, a Japanese mushroom equally highly prized as priced. Matsutake, or Pine Mushroom, stands apart for the Japanese for both its unique aroma and its medicinal qualities. As a remedy it is used, says Hobbs, for difficult labour, acute gastritis, convulsions, worms, tonsillitis, and to lower fevers. In spite of the words of Linnaeus that "a countryman

entering a drugstore turns faint with the scent of the perfumes, but recovers when a heap of cow dung is presented to his nostrils," there seems to be general agreement in the descriptions of the scent of the Matsutake as being incomparable, "difficult to describe", and as an aroma which "once smelled is never forgotten." Since association of smells is a perplexing business, David Arora resorts to analogy by characterising the "unique spicy odour" as "a provocative compromise between 'red hots' and dirty socks."

Each autumn, millions of Japanese make pilgrimages to pine forests to find this mushroom. Unfortunately, during the past few decades the Matsutake has suffered a serious decline due to the decline of pine trees with which it lives in symbiotic association. The American variety, Armillaria ponderosa [White Matsutake], recently renamed as Tricholoma magnivelare, is harvested in large quantities from fir and pine forests in the Pacific Northwest for export to Japan, where it fetches stunning prices.

In the days when the Matsutake was still abundant in Japan, an ornate ritual accompanied the hunting of this mushroom. "Among the nobility, considerable care went into the dress and coiffure prescribed for these expeditions. The men wore tight-fitting green leggings *[patch!],* which were freely displayed when they would secure their robe about the waist to leave their legs free. The women wore embroidered gaiters of white or purple silk, said to 'flutter like anemones' when the kimono was kilted through the obi sash for freer movements.

On returning to the picnic site, those who had been particularly successful were much congratulated, while those who made a poor harvest apologized with mock humility for their stupidity and unworthiness to accompany such a distinguished party. The matsutake were then toasted over a pine fire and enjoyed with soy sauce and vinegar." This may account for the belief in the positive correlation between the amount of Matsutake gathered and the size of a Matsutake lover's smile.

Both Pilat and Arora state that the Matsutake of Japan is very close to the fragrant western variety of *Armillaria [Tricholoma] caligata* and may actually be identical with it.

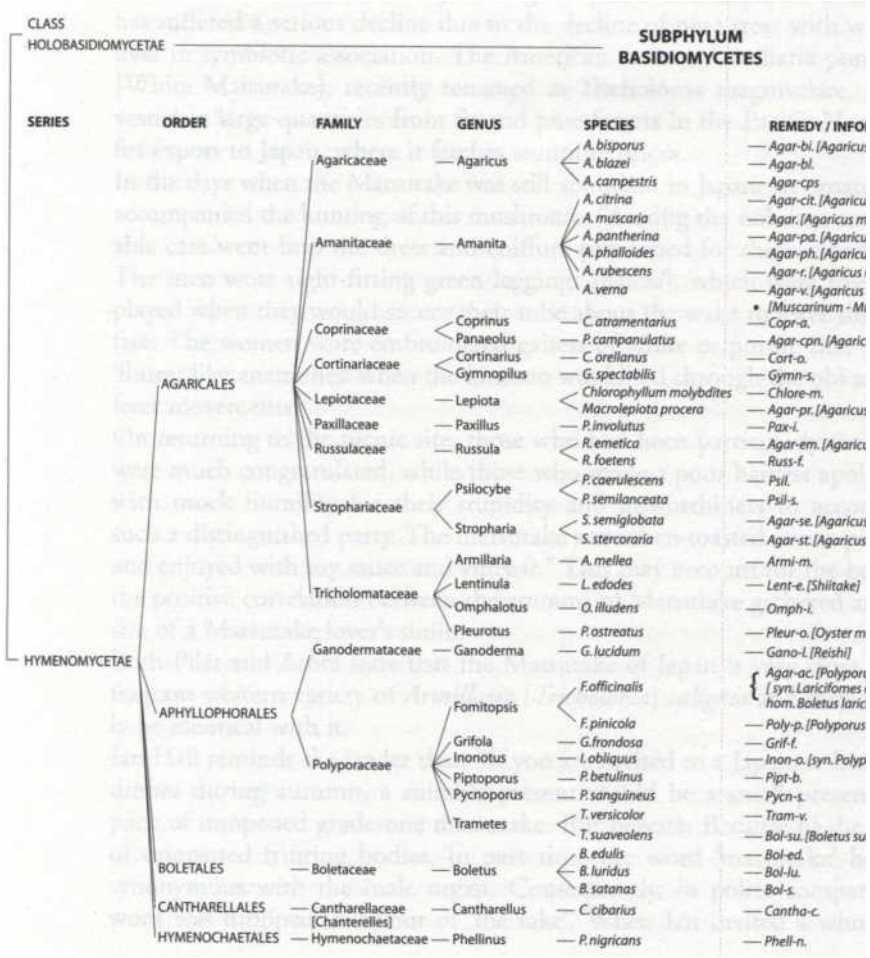
Ian Hall reminds the reader that, "If you are invited to a Japanese home for dinner during autumn, a suitable present would be a small presentation pack of unopened grade-one matsutake. But beware: Because of the shape of unopened fruiting bodies, in past time the word 'matsutake' became synonymous with the male organ. Consequently, in polite company the word was dropped in favour of 'the take'. When Ian invited a wholesaler

near Hiroshima, a packer went into a fit of giggles when asked to bring out specimens of grade-one matsutake, and his interpreter showed distinct discomfort when asked to hold one while he took a photograph.” [Hall, 2003]

IL ORDER APHYLLOPHORALES [POLYPORALES]

II A. FAMILY GANODERMATACEAE

Ganoderma lucidum



Scientific name	Ganoderma lucidum (Curtis: Fr.) P. Karsten 1881.
Synonym	Boletus lucidus Curtis *YII7.*
Common names	Varnished Conk. Reishi mushroom. Lacquered Bracket.
Family	Ganodermataceae.

GANODERMA LUCIDUM

Gano-1.

KEYS

- Saprophytic.
- Appearance well-preserved, lustrous, varnished, lacquered.
- Extremely bitter.
- Grows at the base of trees or trunks in densely wooded mountain areas in dim light.
- Deathlessness. Immortality.
- Flourishes when there is peace and good rule.
- Associated with raven-like birds [ravens brought light into the world].
- Transformation.
- Disorders related to ageing, degeneration, and stress.
- Germanium.

FEATURES

- Fruiting body perennial, semicircular to kidney-shaped, with concentric growth rings.
- Fruiting body placed off-centre on a gnarled or twisted vertical stalk up to 15 cm long; may be stalkless and laterally attached to tree or stump.
- Upper surface glossy, like lacquer; blood-red to reddish brown. Margin paler, white or yellow.
- Under surface cream-coloured, becoming cinnamon with age.
- Spores brown.
- Taste extremely bitter [depending on amount of triterpenes].
- Solitary or in small groups on living and dead deciduous trees, mainly oak, maple, chestnut.
- Always low down on tree or trunk.
- Saprophytic.
- Causes white rot [degrades only the brown lignin and leaves the white cellulose behind].

LONGEVITY

Ganoderma, *ling chih, is* one of the most valued "herbs of deathlessness" in the East. Its use in China dates back to approximately 2000 BC. Ling chih was believed to flourish only when the empire enjoyed peace and good rule. It was said to absorb the earthy vapours and to leave a heavenly atmosphere. Emperors of the great Chinese dynasties and Japanese royalty drank teas and concoctions of the bracket fungus for vitality and long life. Its lustrous, well- preserved appearance may have contributed to this reputation. Depictions of the mushroom can be found on doors, archways, and railings throughout the Emperor's residences in the Forbidden City and the Summer Palace.

The ancient Taoists were constantly searching for the elixir of eternal youth, and Reishi was believed to be among the ingredients. To see it growing was a sign that Heavens mandate was being put to proper use. It thus became a symbol of success, good luck and well-being.

> It is no wonder that the fungus was regarded with awe, for it is a remarkable form of nature that manifests itself in the most unusual places [as fungi are prone to do]. In the year 109 BC during the Han dynasty, Emperor Wu Ti discovered in the inner chambers of his palace a luxuriant growth of nine bifurcate lobes growing from the palace walls. This he took to be a sign of favour. In its honour he composed an ode in which he referred to this *chih* [which is doubtless *Ganoderma lucidum*\ as the "mysterious breath ... this miracle," etc.
>
> In all probability, the growth was the result of using unseasoned wood in the construction of his palace, which was in progress at this time. But such an unromantic explanation should bear a postscript: Emperor Wu Ti was so delighted by its appearance that he not only wrote his fungal ode, but granted amnesty to prisoners and presented families with meat and drink. As for the ode, it became one of the nineteen ritual odes sung on festive occasions.
>
> The miraculous nature of the *ling chih* is farther verified by a stone carving of the Han dynasty which shows two shamanistic figures, replete with horns and wings, kneeling like wraiths; behind one of them the *ling chih* flourishes, while overhead a bird [a raven?] flies. Seldom in history a fungus has been so venerated.
>
> [Emboden 1974]

The life-extending properties of Ganoderma were nothing short of miraculous. The Immortal Mushroom was even believed to have the power of arousing the dead. An ancient official report related that raven-like birds placed the fungus on the faces of dead men with the result that the corpses "immediately sat up and were restored to life." There is good reason to associate Ganoderma with raven-like birds. Whilst in the West the negative aspects of ravens and crows, as feasting on the bodies of the slain, sometimes are emphasized, ravens were seen in China as solar birds and birds of good omen. It was the raven that fetched light into the world. The bird symbolizes new life, for it was the raven that after the Flood was sent out by Noah to see if new land had emerged from the waters.
Arousing the dead or awakening the dormant life force qi?

> *Ling-chih* has an affinity for dead [or relatively dead], low ^/-emitting phenomena in the body, things that are not moving or are very slow moving. If there is stagnation/ excess or accumulative toxins of this description in the body [even if barricaded in by adhesions/ scar tissue from whatever cause] then the situation is appropriate for *Ling-chih.*
> [Broffman, cited by Willard 1990]

MYSTERY AND SECRECY

To discover the very scarce Ganoderma people in ancient times travelled high up in the mountains and deep into the forests since it, in nature, grows in densely wooded mountain areas of high humidity and dim light. Finding the Royal Gano, or alternatively Grifola frondosa [Hen of the Woods], another polyporous fungus eagerly sought after, led to celebrations. People danced with joy, hence these fungi were known as "dancing mushrooms." Discovering the precious "life elixir" could also lead to the other extreme: it had to be kept a secret even from one's closest relatives.
Mystery and secrecy seem elements associated more strongly with fungi than with plants or animals. To track fungi that are hard to find and highly esteemed for their flavour or medicinal virtues requires a certain instinct, which is beautifully captured in a little rhyme by Rollo Leach [cited by Schaechter] that can be applied to any precious mushroom.

> He who secrets reveals
> And nothing conceals
> Somehow never tells
> Where grow morels.

Ancient Chinese Emperors, however, didn't have to resort to secrecy. They simply denied common people the use of Royal Gano and granted the privilege of enjoying its miracles only to those of wealth and high social class.

TRANSFORMATION

In Chinese, the word *tao* means 'the way' or 'the path.' Simplified, Tao might be said to govern the alternation of *yin* and *yang.* "This would explain the basic law at the root of all actual or symbolic mutation, which would allow Tao to be regarded as a principle of order ruling mental activity and the cosmos alike and without distinction. With considerable reservation it may be compared with the Stoic notion of reason, the Logos immanent in the universe as a whole and in each individual in his or her specific fate. In terms of modern physics it might also symbolize a new order born of disorder and the emergence of 'dissipative structures'."[1]

> Andrew H. Miller, age forty-four, is the president df Myco-Herb, Inc. [and a co-author of *Medicinal Mushrooms}.* Miller was interested in the transformational aspects of reishi that the Taoists spoke of so many years ago. His experiences with the mushroom captured for him what it must have been like to the ancient Taoists:
>
> The ancient Chinese medical literature says that reishi can relieve the body of its material weight, prolong life, and transform the person who takes it into a supernatural being.
>
> I felt it was worth a try. I had suffered from chronic lung problems since adolescence. At least twice a year, I would have a bout of bronchitis that was serious enough to warrant a course of antibiotics and bed rest. Once I began taking reishi, there was no looking back. Although I have the occasional cold or flu, I have not had one case of bronchitis since.
>
> Another experience I had with reishi dealt more with the psychic side of my being. I had been told by colleagues that some people experience a "psychic healing crisis" when taking reishi. That one happened to me. Within a few days of taking my course of reishi, I noticed that my dream state was becoming more agitated.
>
> I dreamed about people and places and situations that I had long ago forgotten about or buried in my subconscious - unpleasant experiences from my childhood, emotions and anxieties relating to events long forgotten. I would wake up in a cold sweat and lay awake for hours reflecting on these

memories, sights, sounds, and even smells that had risen from my subconscious.
The time spent lying awake was, I realize now, the beginning of a profound transformation for me. I had been carrying around a lot of negative psychic burdens, and reishi was expunging them and ridding me of the burden of carrying them around.
While in my waking state, it was as if I was able to detach myself and observe my interactions with other people, as if I were in the audience and on stage at the same time. I was able to see how I interacted with people and subsequently, I was able to perceive behaviour patterns and ways of communicating with other people that I was unhappy with and wanted to change.
Well, I did change. I felt as if the terrain of my mind and body had shifted dramatically. I was not the same person anymore. Reishi calmed my mind, my nerves, and allowed me to concentrate more fully - allowed me, I think, to enjoy life more fully.
[Halpern & Miller 2002]

1 Chevalier & Gheerbrant - The Penguin Dictionary of Symbols.

THERAPEUTICS

The mushrooms Latin name derives from *gan,* shiny or lustrous, *derm,* skin, and *lucidum,* polished, glossy or brilliant. Ganoderma species are traditionally differentiated by colours. The six colours - red, white, yellow, blue, black, and purple - may well turn out to belong to six different species. The red Ganoderma is Ganoderma lucidum.
It is considered the most potent and was described by the pharmacologist and medical scholar Li Shi Zhen [1518-1599] in his Materia Medica as “bitter in taste, warm in nature, not poisonous, and replenishes the life energy, or qi of the heart, repairs the chest area and benefits those with a knotted and tight chest; it increases intellectual capacity while nurturing the body, and banishes forgetfulness; taken over a long period of time, agility of the body will not cease, it keeps the body light and youthful like a celestial being.” Traditional indications for its use include debility, loss of strength, lassitude, insomnia, nervousness, poor digestion, gastric ulcers, chronic bronchitis, asthma, and mushroom poisoning. Modern indications include coronary heart disease, chronic bronchitis, hypertension, high cholesterol, diabetes, hepatitis, cancer, allergies, and chronic fatigue syndrome.

Of special note are reishi's action on the lungs and heart. In clinical studies conducted in China during the 1970s, over 2000 patients with chronic bronchitis were given a tablet form of reishi syrup. Within 2 weeks, 60- 90% of the patients showed marked improvement, including increased appetite. The older patients, especially, seemed to benefit the most, and those with bronchial asthma, in particular, responded well [Chang & But, 1986].

... Reishi has been found to be effective for two unusual applications. First, it alleviates high altitude sickness by oxygenating the blood. Chinese mountain climbers given *G. lucidum* before ascending mountains as high as 4,000-5,000 m felt minimal reactions to the climbs [Chang & But, 1986]. Second, and most unusual, *G. lucidum* has been found to be surprisingly effective in treating myotonia dystrophica, a rare hereditary disease characterized by muscular atrophy which begins in the face, neck, and larynx, and progressively affects the musculature of the whole body. Eventually even the skin and many glands such as the pituitary, thyroid, parathyroid, adrenal, and gonads atrophy as well. There is no known cure for this disorder.

Although reishi is not a cure, it can help alleviate symptoms. In one study, patients with myotonia dystrophica [lack of muscle tone] were given 400 mg/day of water-soluble *G. lucidum* spores administered i.m. Many showed marked improvement in muscle strength, improved sleeping and eating patterns, and weight gain within 1-2 weeks. Patients unable to lift their heads before treatment were able to do so after treatment, and their speech and walking ability improved as well. Indeed, in three cases the disease even ceased to progress [Fu & Wang, 1982].

... In my experience, it is especially suitable as a calming herb for people with anxiety, sleeplessness, or nervousness accompanied by adrenal weakness or general neurasthenia or deficiency syndromes. In this regard, it is to be much preferred to traditional western sedative herbs such as valerian, which could be too warm and actually stimulating for some individuals. [Hobbs 1995]

The use of Reishi as a cancer treatment in the Orient is centuries old. Clinical studies at Sloan-Kettering Cancer Center during the 1990s suggest that "application of Ganoderma should be studied and considered for

[1] chemoprophylaxis of cancer in individuals at high risk for developing cancer,

[2] adjuvant use in the prevention of metastasis or recurrence of cancer,

[3] palliation of cancer-related cachexia and pain and
[4] adjunctive use with concurrent chemotherapy to reduce side-effects, maintain leukocyte count and allow a more optimal dosing of chemo or radio therapeutics."

Ganoderma appears to have an affinity with disorders related to ageing, immune-deficiencies, degeneration and stress as well as with heart problems and blood fat levels. In a Chinese study conducted in 1977 to test Ganoderma in coronary heart disease, the fungus was administered to 103 patients in seven different hospitals.

> All Western medications were removed except for nitro-glycerine, if and when needed. The majority of patients ranged from age 40 to 60 years with a history of coronary heart disease of over one year. To be effective," the treatment had to either completely resolve or 'markedly' alleviate the symptoms and at the same time improve the ECG reading.
> A tall order for success, yet except for the most serious cases, in which the fungus proved ineffective, Reishi came through with flying colours. Out of a final total of 90 cases from seven different hospitals, the *Ganoderma* treatment was effective on average in 81.77% of patients.
> The lowest level of treatment effectiveness was 66.7% of cases! Best results were found at the Nanjing Gulou Hospital where 93.3% of coronary patients markedly improved after one to four months on the tablets. In addition, some patients experienced improved appetites, better spirits and weight gain.
> ... A symptom-by-symptom account of the outcome [shows the following]: Ganoderma was effective in 60% of patients with coronary heart disease presenting with arrhythmia; in 90.4% for sensation of fullness in chest; in 86.7% for headache and dizziness; in 84.4% for angina pectoris; in 77.8% for weariness; in 77.8% for insomnia; in 73.9% for cold extremities; and in 72.5% for breathing difficulty [short breath],
> [Willard 1990]

Two patients with post herpetic neuralgia resistant to other therapies and two patients with severe pain due to herpes zoster infection were reported to experience dramatic pain relief upon administration of hot water soluble extracts of reishi. Various Ganoderma polysaccharides have been isolated that show significant antiherpetic activity in vitro against both HSV-1 and HSV-2.

ACTIVE CONSTITUENTS

Ganoderma contains a number of compounds with potent physiological effects, including:

- Specific polysaccharides. These agents possess immunomodulating and antitumour properties.
- Triterpene compounds, known as ganodermic acids; lower blood pressure, decrease cholesterol levels, and reduce platelet aggregation.
- Adenosine; caffeine antagonist; relaxes skeletal muscles and calms the central nervous system; therapeutically used as an antiarrhythmic.

Saprophytic. Appearance well-preserved, lustrous, varnished, lacquered. Extremely bitter. Grows at the base of trees or trunks in densely wooded mountain areas in dim light. Deathlessness. Immortality. Flourishes when there is peace and good rule. Associated with raven-like birds [ravens brought light into the world]. Transformation. Disorders related to ageing, degeneration, and stress. Germanium.

[Benjamin 1995]

The Lacquered Bracket's long history has both sparked interest and been greeted with scepticism in the West.

The active compounds include bitter-tasting triterpenes [at least 100 different triterpenoids have been identified in *G. lucidum*] and many polysaccharides. Properties accorded to this mushroom include an analgesic effect [adenosine], antihepatotoxic activity [R,S-ganodermic acid and ganasterone], anti-inflammatory activity [glucan], antitumour activity [polysaccharides and glucan], cardiotonic activity [alkaloids, polysaccharides], hypocholesterolemic action [ganodermic acids], inhibition of histamine release [ganodermic acids and oleic acid], hypoglycaemic action [ganoderans], hypotensive action [ganderols], immunomodulatory activity [polysaccharides and proteins], stimulation of interferon production, inhibition of platelet aggregation [adenosine], radiation protection, enhancement of protein synthesis, and restoration of neuromuscular activity.

Despite this impressive list, the role of this mushroom in medicine and health will remain shrouded in mysticism

To this impressive list can be added, according to Hobbs, some more pharmacological effects observed in vivo and in vitro: antibacterial; antiviral; enhancement of bone-marrow cell proliferation; anti-HIV activity; and improvement of adreno-cortical function.

• The stalk contains magnesium, calcium, zinc, manganese, iron, copper, and germanium, while the cap contains the same excluding copper. Of special interest is germanium. Several studies have shown high germanium contents in Reishi. One study, where the germanium contents in the analyzed samples were low, demonstrated that germanium in Reishi becomes significantly high when it is cultivated on log beds soaked with organic germanium. This indicates that the fungus has the property to concentrate germanium from its substrate. Medicinal herbs such as garlic, comfrey, aloe, and ginseng are also rich in germanium.

• No data are available on the possible role of germanium in the medicinal activity of Ganoderma. Yet a comparison of the therapeutic effects of the trace element and the fungus reveals some interesting things. “The following conditions have been reported to respond favourably to germanium at doses that are therapeutic rather than nutritional: arthritis, angina pectoris, myocardial infarct [heart attack], stroke, Raynaud’s disease; Candida albicans infection, burns, cancer pain [where it is alleged to have an analgesic effect] and some types of cancer.
These reports are in the main anecdotal or taken from physicians’ case histories rather than double blind, crossover, controlled clinical trials. It is generally believed by its supporters to function by boosting the action of oxygen in generating energy and the life force i.e. the flow of energy from organ to organ in the body.
Germanium maintains homoeostasis in the body and so is claimed to reduce high blood-pressure to normal, lower high blood cholesterol levels, protect against demineralization in osteoporosis, normalize haemoglobin production and reduce the development of hypoxia [lack of oxygen supply to tissue and organs]. It is alleged to exert a positive effect on the immune system by normalizing antibody production in cases of allergy. It is possible to demonstrate dose-dependent antiviral, antibacterial and antitumour activity. One way in which it appears to function in this respect is by stimulating interferon production by the body cells.”[1]

1 Mervyn - Vitamins & Minerals; Thorsons, London, 2000.

CLINICAL MANIFESTATIONS

Of the three categories into which the Chinese [and Japanese] classified their medicines, Ganoderma was placed in the group of superior medicines and within this group it was ranked the Number One Herb, ahead of Ginseng, which was ranked Number Two. The main characteristic of the superior grade is the absence of side effects even if taken for a long period of time. Side effects of Ganoderma are limited to so-called recovery symptoms, symptoms that occur during the early stages of taking the fungus. The result of increased body activity to eliminate accumulated waste products, the symptoms consist of itchy skin, increased bowel movements, and/or pimplelike eruptions.

Willard [1990] reports the case of a "menopausal woman, generally in good health, but suffering from insomnia and slight arthritis," who within a few days of taking twice daily 2 tablets of Reishi [300 mg] had "aggravated symptoms and dizziness, feeling light-headed and almost drunk, an itchy scalp, increased bowel movements and especially arthritic pains." Other side-effects are infrequent and include dizziness; dryness of the mouth, throat and nasal areas; stomach upset; loose stools; sleepiness; bloating; thirst; frequent urination; and abnormal sweating.

The cleansing effect, as well as other health benefits, resembles the purgative action and benefits attributed to the polypore White Agaric, Fomitopsis officinalis.

II B. FAMILY POLYPORACEAE

Fomitopsis officinalis	[syn. Polyporus officinalis]
Agaricicum acidum	[= Agaricin, active constituent of F. officinalis]
Fomitopsis pinicola	[syn. Polyporus pinicola]
Grifola frondosa	[syn. Polyporus frondosus]
Inonotus obliquus	[syn. Polyporus obliquus]
Piptoporus berulinus	[syn. Polyporus betulinus]
Pycnoporus sanguineus	[syn. Polystictus sanguineus]
Trametes versicolor	[syn. Polyporus versicolor]

Polypores

Polypores are fungi with poly [many] pores [passages], tubes lined with hymenium through which spore dispersal takes place. There are about 100 genera in this family. They are saprophytes on dead or decaying woody plant parts, tree trunks, stumps, logs, branches, or buried wood. They decompose wood and contribute to the degradation of lignin and cellulose. A few occur on living trees, where they cause heart rot [decay of the inner wood of trees] and thus become parasitic.

Polypores are generally shaped like brackets, hooves or shelves, not like umbrellas. If there is a stem, it is usually short and off-centre, but not always, as in Ganoderma, where the stalk may reach a length of 15 cm.

Soft-bodied, fleshy fungi are short-lived; they mature overnight and are gone in a couple of days. They are adapted to get maximum spore yield from minimum mass of fruiting body. At the other extreme of the lifetime strategy spectrum are the polyporous bracket fungi and allied species. They achieve massive spore production by *increasing the lifetime* of the fruiting body. The hymenium continues to develop centrifugally, new zones being formed in the zone near the margin. Such fungi consist of mechanically strong structures resistant to adverse weather conditions and attack by pests.

Polypores, like other fungi, favour certain temperatures for maximum activity. Fomitopsis officinalis flourishes in relatively low temperature [20° to 24° C], whereas Ganoderma lucidum does best in temperatures above 32° C.

Some polyporous fungi have a long history of folk medical use by indigenous peoples. Several polypores are employed in oriental medicine, including

Reishi [Ganoderma lucidum] and Maitake [Grifola frondosa].

The Maori of New Zealand associate certain white bracket fungi growing on beech trees with followers clinging to a great chief, in the same way as the fungus adheres to the tree. The fungus was employed as tinder for the generation of fire and to carry fire from place to place. The tinder polypore or "Amadou" [= Fomes fomentarius] has been used similarly in Europe.

Medical merits

Polyporous fungi are almost invariably associated with endurance and stamina. Since bracket fungi are present year-round and persist for decades instead of perishing overnight, like other fungi do, the Chinese regarded them as symbols of longevity and immortality.

The common bonds shared by these fungi are their substrate - trees - and the occurrence of polysaccharides. The polysaccharides are synthesized from trees, symbols of life constantly developing and ever rising to the Heavens. Some of these complex carbohydrates, e.g. glucan, lentinan and mannan, have been shown to be immunostimulating rather than displaying cytotoxicity. Their specific effect is the activation of macrophages and T-lymphocytes, stimulation of interferon, and enhancement of cell-mediated immune response.

According to P.K. Tsung, in "Anti-Cancer and Immunostimulating Polysaccharides" [OHAI Bulletin, 1987], the effects should be considered as an anti-ageing property since our immunity decreases with age. Viewed in that light the claim that polypores prolong life makes sense.

[Jeff Chilton; www.nammex.com]

More than 50 mushroom species have yielded potential immunoceuticals [substances having immunotherapeutic efficacy] that exhibit anticancer activity in vitro or in animal models and of these, six have been investigated in human cancers. "A trend toward integration of immunopotentiating agents with the extant cancer regimens of surgery, chemotherapy, and radiation therapy is now considerably advanced in Japan and China - countries where mushroom preparations have been an anticancer resource for centuries. In the West, a more proactive approach to cancer management is long overdue, with the glaring failures of conventional modalities to cure common cancers and the availability of good clinical evidence supporting mushroom immunoceuticals. Misplaced dogma should soon give way to a new round of clinical and basic

research aimed at melding this immunotherapy approach into qualitative improvement of cancer survival rates. The most frequent cause of shortened survival of the patient with cancer is metastasis, occurring with or without invasion of the surrounding tissues by the formed tumours. Surgery often successfully reduces the tumour mass, and chemotherapy or radiation therapy sometimes will further reduce detectable tumours and minimize invasiveness and metastasis. However, these toxic therapies invariably damage host immunity, and small invasive masses or malignant cell clumps [as little as 100,000 cells or less] predictably survive the best efforts to eradicate them. With their capacity to mobilize the immune system against formed tumours as well as metastases, while lessening the adverse side-effects of conventional therapies, mushroom immunoceuticals should offer clinically-attractive options to the thinking oncologist."
[Parris M. Kidd; www.thorne.com/altmedrev/fulltext/cancer5-l.html]

Introducing such drugs into homeopathy is one thing, but identifying them as individual remedies is quite another. It goes without saying that much work - provings, empirical trials - will be required to achieve this. An excellent opportunity for more symbiosis within the homeopathic community! The available clinical data, combined with analogies and signatures, may serve as first indications to give polyporous, and other unproven, fungi a place in our materia medica. An alternative starting point is to assume that polyporous drugs belong to the cancer miasm, a miasm that, incidentally, includes a good deal of the tubercular

POLYPORUS OFFICINALIS

[Boletus laricis]

Scientific name Fomitopsis officinalis (Vill: Ft.) Bondartsev & Sineer 1941.
Synonyms Boletus laricis Jacq. 1778.
Polyporus officinalis Vill. 1789.
Fomes officinalis (Vill.) Bres. 1931.
Laricifomes officinalis (Vill: Fr.) Kotl. & Pouzar 1957.
Common names Quinine Conk. Quinine Fungus.
Family Polyporaceae.

Known in homeopathy under a bewildering diversity of names: Boletus laricis, Boletus purgans, Polyporus officinalis, Larch Boletus, Purging Agaric, White Agaric, and Larch Agaric.

KEYS

- Saprophytic or wound invader.
- Grows on the middle and upper portions of trunks and trees.
- Extremely bitter.
- Used as a vulnerary.
- Great prostration.
- Restlessness at night.
- Marked chilliness.
- Gastrointestinal disorders.

FEATURES

- Fruiting body perennial, emerging as a whitish knob, then becoming hoofshaped or pendulous.
- Upper surface banded and white-yellow when young; cracked, greyish or light brown when older.
- Under surface white when young, becoming light brown with age.
- Flesh cheesy, white or grey when young, crumbly in mature or old specimens.
- Spores whitish.
- Odour farinaceous; taste extremely resinous and bitter.
- Solitary or several on living and dead conifers, commonly larch, pine, spruce, fir, hemlock, and Douglas fir. [A single fruiting body indicates that

most of the wood volume has been destroyed.]

- Common. Perennial.
- Saprophytic or wound invader.
- Enters the heartwood through wounds or fire scars on the tree stem.
- Causes brown trunk rot [degrades only the white cellulose and leaves the brown lignin behind].
- Common in the middle and upper portions of the trunk. [Commercial "quinine conk" collectors used to dislodge them with rifles.]

HISTORY

From as early as the 5th century BC, fungi have played an important role in medical practice. White Agaric has been a universal remedy for many complaints and Dioscorides esteemed it as a cure-all. White Agaric was the "female agaric" while the "male agaric", Polyporus igniarius [= Fomes fomentarius] was used for preparing touchwood, called punk or German tinder.

From the 9th century onwards White Agaric was an ingredient of recipes to treat cancerous conditions, tumours, ulcers, indurations of spleen, and was used as a purgative. The peeled dried fruiting body of the fungus has been used by the Ainu of northern Japan as a sweat-reducing agent, to relieve stomach ache and to ease pain.

This polypore is the agaric, or agaricum, of the ancients and has subsequently been called *Agaricus albus,* White Agaric, Purging Agaric, Larch Agaric, and Quinine fungus. ... Pliny was the first to write about the agaric. ... Dioscorides wrote that agaric was used for just about everything. Not only did he use it as a styptic, but he also used it for injuries, bruises, falls, and fractured limbs; kidney diseases with difficulty in passing urine; menstrual insufficiency; liver complaints and jaundice; hysteria; dysentery; epilepsy; sallow complexion; internal weakness of the organs; asthma; colic; phthisis; pain in the hips, loins, and joints; poisoning, snake and animal bites.

Fomitopsis was used as a panacea, according to Dioscorides' prescription, for the next 1600 years or so. Gerard [1633] reported that agaric was still used in his time to cleanse the intestines and for jaundice, menstrual difficulties, oedema, asthma, chronic fevers, and to restore healthy complexion, among other things.

My own experience with this fungus suggests to me that this is indeed a very good tonic, when used in small amounts before meals. ... If the tea is taken in substantial quantities, intestinal irritation, nausea, and vomiting can occur in sensitive individuals. ...

In the late 1800s, the *Agaricum* was incorporated into the famous "Warburg's Tincture," otherwise known as the "Antiperiodica Tinctura." Warburg's Tincture was used widely well into the 20th century for a variety of conditions, but mainly to check night sweats due to tuberculosis, reduce excess secretions, and as a digestive stimulant to be taken in cases of tuberculosis and malaria.

[Hobbs 1995]

THERAPEUTICS

Eclectic medicine, in the 19th century, used Fomitopsis officinalis, under the name "Boletus laricis," extensively. In the 1898 edition of *Kings American Dispensatory,* Harvey Wickes Felter and John Uri Lloyd comment on its use:

The dust of the Larch agaric is irritating to mucous surfaces, causing tears when it enters the eyes, and sneezing, cough, and nausea, when the nostrils are exposed to it. It has been used in 1/2 dram or dram doses as a purgative; in larger doses as an emetic. Small doses, unless long continued, check diarrhoea, as well as excessive broncho-pulmonary secretions; hence the value of agaric and agaricin in phthisis. Boletus is also said to arrest the mammary secretion. In doses of 3 to 10 grains, gradually increasing to 60 grains in the course of the 24 hours, it has been found efficient in arresting the nocturnal perspiration of consumptives.

For this purpose, however, agaricin is now preferred. Owing to its power over the sympathetic and spinal nervous system, certain cases of epilepsy and chorea have been controlled by it; and in neuralgia and insanity it has been found of value where nutrition was imperfect and the cerebral circulation feeble.

As a remedy for ague it is adapted to those cases presenting alternate chills and flushes of heat, with heavy bearing-down pains in the back. The patient perspires freely at night and has a yellow-coated tongue, bitter taste, poor appetite, slight fever, and has for some time been experiencing a dull, languid feeling. Not only does it check phthisical night-sweats, but it also controls the rapid circulation and reduces the hectic fever.

MATERIA MEDICA

Proving

[1] Burt and Lord, in 1868; 6 [male] provers. Method: repeated doses of the crude substance, lx and 3x. Observation period: one to ten days.

Proving symptoms

[Number between brackets refers to the number of provers experiencing the symptom.]

Mind

<= Gloomy, desponding, sad, low-spirited and irritable [4].

> "Feel dull and indisposed to exertion; for five days succeeding this I had not my usual appetite or spirits; suffered from a general feeling of not being quite well, but without any special describable pains or symptoms; it was precisely the feeling of one who is said to be bilious."

«· "Great depression of spirits, cried during the whole examination." [cured case]

== Aversion to change. [Repertory]

Energy

= Great weakness and prostration [5].

~ Can hardly stand up [from weakness of knees] [i]. With severe aching in all the large joints [1].

= Weakness in arms and legs, can scarcely walk or stand [1].

~ *Great restlessness at night* [3J.

Temperature

» Great *chilliness* [3].

General [2]; between scapulae [1]; with icy coldness of the nose [1].

> "While sitting in a warm room by a fire reading, I felt slight chilliness creep up the back to nape of the neck, most noticeable between the shoulder blades; this was succeeded by a general feeling of chilliness, lasting for several minutes; for the moment it did not seem that this was the effect of the drug; I imagined the room was getting too cool, and rose to stir the fire, when the truth occurred to me: I mention this to show that this symptom was no imaginary one, caused by any expectation of such an effect."

Patient takes cold from the least damp change. [Burt]
== Skin extremely dry and hot [1]; face hot and flushed [1]; hands hot and dry [3]; feet hot and dry [ij.

Appetite & Thirst
= Appetite decreased [2]; for breakfast [1], supper [1], dinner [ij.
<= Appetite increased [1], "invigorated."
-> Much thirst [i].
» "Craves cold water all the time." [cured case]
= Desire for sour things [1], which > [i].

Pains
= Dull, aching [head; stomach; liver; umbilical region; bowels; hypogastrium; left lung; lumbar region; limbs; hips].
<■ Burning [stomach; region of transverse colon].
= Sharp, cutting [stomach; bowels; umbilical region; spleen; left lung; hipjoint].

Modalities
= Motion < [headache; back pain; sharp pain in heart region; pain in ribs; pain in knees and ankles].

Head
— *Dull frontal headache* [4].
< Motion; walking [3].
& Light, hollow feeling of the head [i].
"Awoke with a dull pain in the head, which continued all day; thought it might be due to a glass of ale drank the evening before [3rd day]; awoke with a dull pain in the head, with sensation of soreness in the brain, < stooping or shaking the head; this headache is precisely similar to that experienced on the third, which I attributed to the glass of ale; I now believe that the pain at that time was caused by the Polyporus [7th day.] "

Mouth
— Tongue coated white [1], yellow [2], or light brown [i],
= Taste bitter [2], coppery [3], sweetish, nauseous [i].

Stool

= Loose [5]; mushy [4]; mixed with mucus [1]; very light-coloured [2] or very dark [black] [2]; watery [i],

"The stools were not so black, and all contained more or less undigested food, and were mixed with water; also a number contained something that had the appearance of oil; it was in drops, from the size of a common new cent down to small drops; the colour was clear and white; was it oil or ■S» not?

Stools of pure mucus; or mucus, blood, and bile, with great faintness and distress in the solar plexus after stool, from portal congestion. [Marked characteristic, according to Burt.]

=· Dry, hard, lumpy, dark [3].

Peculiars

» Sensation as if teeth were pressed out of sockets.
= Nausea felt in throat.
<■ Coldness of stomach, followed by burning.
= Lump sensation in stomach.
= Sharp, stabbing pain in right lobe of liver and lower dorsal region on breathing deeply.
= Slight pain shooting up the nape of the neck, from between the scapulae, followed by a little soreness of the occipital region, & disposition to throw the head back.
= Severe backache; back very stiff; can hardly rise up after sitting down a few minutes.
<= Frightful dreams of water.

Saprophytic or wound, invader.
Grows on the middle and upper portions of trunks and trees.
Extremely bitter.
Used as a vulnerary.
Great prostration.
Restlessness at night.
Marked chilliness.
Gastrointestinal disorders.

AGARICICUM ACIDUM **Agar-ac.**

Active constituent of Fomitopsis [Fomes or Polyporus] officinalis. **Synonyms** Agaricin, Agaric acid.

NOTE: Has erroneously been given two separate abbreviations: Agar-ac. and Agarin.

MATERIA MEDICA

- "Agaricin [agaric or agaricinic acid], is irritant to the gastro-intestinal tract, occasioning, in doses of 5 to 15 grains, purging and vomiting. Upon the lower animals it depresses the nervous, respiratory, and circulatory systems. According to Riegel 1/6 grain of agaricin is equal, as an anti-perspirant, to 3/4 grain of atropine. In doses of 1/16 to 1/6 grain it has been remarkably effectual in colliquative sweating, especially in phthisis, where it also allays thirst and controls the cough and diarrhoea in some cases. Long continued use of it will produce looseness of the bowels." [Kings American Dispensatory]

=> Boericke mentions "phthisical and other enervating night sweats, 1/4 to 1/2 grain doses; also in chorea, in dilatation of heart with pulmonary emphysema, fatty degeneration, profuse perspiration and erythema."

» Blackwood finds it "useful in dilatation of the heart, when complicated with pulmonary emphysema, fatty degeneration, and weakened heart action from acute diseases and old age, when attended with profuse perspiration and erythema." "This remedy," he says, "is of special service in those patients who have nervous dyspepsia. ... In those patients who have been addicted to the excessive use of tea, coffee or tobacco, or are recovering from some debilitating disease that has greatly weakened the heart; the pulse is weak and irregular, while the hearts action is weak and attended at times by violent palpitations. There is profuse sweating with twitching of the muscles and dilatation of the heart."

POLYPORUS PINICOLA **Polyp-p.**

Scientific name	Fomitopsis pinicola (Sw.: Ft.) P. Karsten 1881.
Synonyms	Boletus pinicola Sw. 1810. Polyporus pinicola Sw.: Fr. 1821. Fomes pinicola (Sw.) Fr. 1849. Ungulina marginata (Fr.) Pat. 1900.
Common name	Red-Belted Conk.
Family	Polyporaceae.

KEYS

- Saprophytic or wound invader.
- Pioneer invader.
- Grows at the base of trees or trunks.
- Tonic properties.
- Narcotic properties; gives a real 'kick'.
- Styptic.
- Joint problems.

FEATURES

- Fruiting body perennial, hoof-shaped or shelf like; hard and woody in age.
- Upper surface reddish grey to dark brown, resin-coated [varnished].
- Distinct red-brown band around upper edge of fruiting body.
- Underside white or pale yellow, *not* staining brown when scratched.
- Spores light brown to ochre.
- Flesh corky or woody, very tough.
- Solitary or in groups, mainly on dead conifers [spruce, pine, Douglas-fir], less frequently on birch and alder. [Pinicola comes from *pin,* pine, and *col,* inhabitant.]
- Common. Perennial.
- Saprophytic or wound invader.
- Pioneer invader, often attacking standing dead and dying trees. Causes extensive rot in the base part of the tree, which finally falls over, usually in the winter, leaving a stump with a flat surface of fracture.
- Causes brown trunk rot; degrades only the white cellulose, leaving the lignin behind as brown residues. [These residues are of great importance to the soil in coniferous forest ecosystems. They improve the water-holding capacity of the soil.]

THERAPEUTICS

• Fomitopsis pinicola has an early history of use in dysentery and for nervous headache. It also has tonic properties and supports digestion.

• The Yupik Eskimo of Nelson Island burned the fungus and mixed the ashes with snuff to improve the narcotic properties of the preparation, said to give it a real 'kick'.

• The Cree Indians used a paste of the dried and powdered fruiting body as a styptic for bleeding wounds. Taken internally it served as an emetic for purification.

• King's *American Dispensatory* [1898] found both *F. pinicola* [and F. officinalis] "valuable in the cure of obstinate and long-standing intermittents, and other diseases common to malarial districts, as obstinate bilious remittent fever, chronic diarrhoea, chronic dysentery, periodical neuralgia, nervous headache, ague-cake [swelling of the spleen], and increased flow of urine. They have likewise proved useful in long-standing jaundice, and in the chills and fever common among consumptive patients."

• Used in the 1800s as a remedy for ague by the people of the middle and southern states of the USA, who macerated it in whiskey and took it during the intermission [of the fever].

MATERIA MEDICA

Proving
Introduced into homeopathy by Hale, who "got his knowledge of its anti- periodic power from the lumbermen of northern Michigan."
Proved by Burt, 1868, self-experimentation with increasing doses of tincture, lx and 2x; and by Fuller, 1870, experiment on self with the tincture, and observation of "effects in a woman of taking three times a day a preparation of 1 or 2 ounces of the fungus in a pint of whiskey."
The symptoms are almost identical to those of Polyporus officinalis.
Polyporus pinicola seems to affect the joints more, while Polyporus officinalis acts stronger on the gastrointestinal tract.

Proving symptoms

Mind
= Gloomy, desponding, with the pains.

Head
= Congestion of head and face.
& Vertigo [when walking].
& Redness of face with prickling sensation all over face.
& Hot feeling in face and eyes.
= Dull frontal headache.
& Light, hollow feeling of the head.
& Sour eructations.

Mouth
= Tongue coated white or yellow .
=» Taste bitter, slimy, coppery, sweet, flat.

Throat
« Soreness and dryness of throat.
& Frequent inclination to swallow.
& Swelling of tonsils; swallowing painful in the morning.

Abdomen
=» Dull, dragging pains in right hypochondrium/ liver.
After stool.
< Walking [= sharp pains in liver].
Extending over whole dorsal region.

Stool
» Loose; dry, hard, lumpy, dark, hard [1]; no stool.

Joints
=> Elbows, wrists, fingers, hips, knees, ankles, feet, toes.
« Pains preventing sleep.
= Pains dull, aching, drawing.
» Stiffness of fingers; sharp pains in them when closing them.
« Walking difficult, due to pain in ankles, feet, and toes.

Saprophytic or wound invader.
Pioneer invader.
Grows at the base of trees or trunks.
Tonic properties.
Narcotic properties; gives a real 'kick'.
Styptic.
Joint problems.

« Sore, bruised [as if beaten] pain in soles of feet and heels; cannot bear to have boots on.

"Those rheumatic symptoms have all continued since the fourth day; the last three days it has rained most of the time; the dampness of the air has aggravated the symptoms most wonderfully, especially nights; pains in shin-bones, very hard to endure [11th day]; rheumatic symptoms lasted eight weeks. All the pains aggravated by motion [3rd day].

For ten days, every day about 10 a.m., my head would commence to ache, with severe aching pains in the back, but more especially in the legs; would gradually increase until 3 p.m., when the pains in the legs were so severe that I had to lie down to get relief; with this there was great despondency and weakness; from 3 p.m. to 6 p.m. it would gradually pass away, and all the evening I would feel perfectly well. The effects in the legs did not entirely leave until four weeks subsequent to taking the medicine." [Burt]

Peculiar

°» Peculiar sensation as though I would like to get away out of sight and lie down. [Fuller]

[Repertory: Mind, Retirement, desire for.]

Scientific name	Grifola frondosa (Dicks: Fr.) Gray 1821.
Synonyms	Boletus frondosus Dicks. 1785.
	Polyporus frondosus.
Common names	Hen of the Woods. Sheeps Head. Maitake. Dancing Mushroom.
Family	Polyporaceae.

GRIFOLA FRONDOSA

Grif-f.

KEYS

- Bracket fungus appearing in dense, overlapping fronds.
- Saprophytic or parasitic; annual.
- Sensitive to environmental changes.
- Blood sugar levels. Diabetes.
- Obesity.
- Cancer regression; immunostimulation.

FEATURES

- Forms dense fronds of small overlapping leathery brackets from a single, repeatedly branched base.
- Individual brackets 4-6 cm, thin, fleshy, spoon-shaped, fanshaped or tongue-shaped, with wavy margins.
- Cream-coloured to ochre or greyish brown; brackets often with a pale edge.
- At the base of decaying logs and stumps of deciduous trees, especially old oaks. Occasionally on living trees. Fruitings most frequently arise at or near the stump/soil interface.
- Late summer to autumn; annual.
- Edible, especially the tips; regarded as delicious by many. Grows tough as it matures.
- Saprophytic-parasitic.
- Produces white heart rot.
- Reappears often in the same place in subsequent years because the mycelium goes into dormancy over the winter in the tree roots and the base of the trunk. Mycelium spreads into the soil where it forms masses binding the soil together.
- Found throughout the northern temperate region in Japan, Europe, and

eastern North America.

- Extremely sensitive to environmental changes.
- Explanations given for the Japanese name 'Maitake' include a resemblance with a dancing nymph or dancing butterflies and refer to dancing with joy when the fungus is found. Similar diversity exists in regard to the scientific name; according to some Grifola means "braided fungus," whilst others come with a more imaginative allusion to "griffin," an imaginary animal with a lion's body and an eagle's beak and wings.

THERAPEUTICS

- Although young Grifola brackets are reported or suspected to cause "allergic reactions," the extract of the fungus is claimed to have no adverse effects. These allergic reactions consist of nausea, vomiting, tingling in the extremities, dizziness, and disorientation.

Bracket fungus appearing in dense, overlapping fronds.
Saprophytic or parasitic; annual.
Sensitive to environmental changes.
Blood sugar levels.
Diabetes.
Obesity.
Cancer regression; immunostimulation.

Commercially produced in Japan as an edible fungus for medication, the Hen of the Woods is "the most contemporary entry into the health sweepstake," writes Benjamin pedantically. The fruiting body is rich in essential amino acids, vitamins Bl, B2, and C, and minerals such as selenium, zinc, and tin [stannum].

Laboratory studies with Maitake nevertheless have shown "encouraging preliminary results for treatment of many cancers, hypertension, and hepatitis B." In Japan, many research results have applied for patents.

A Chinese study found the fruiting body of Maitake to con-

powdered fruit body of maitake was given orally to a genetically diabetic mouse, blood glucose reduction was observed, in contrast to the control group in which the blood glucose increased with ageing. Moreover, levels of insulin and triglyceride in plasma demonstrated a change similar to blood glucose with feeding of Maitake."

- Based largely on animal studies several medication and healthcare functions have been suggested:

A] Cancer regression. Some results seem to indicate that breast, lung and liver cancers respond more favourably to Maitake treatment than bone cancer, stomach cancer or leukemia. A number of natural medicine

practitioners in the U.S. have also reported good results with patients with uterine fibroids and in prostate cancer cases where chemotherapy didn't work.

B] Slowing down of ageing and improving gonad function.

C] Prevention and treatment of diabetes.

D] Reduction of obesity, lowering of serum cholesterol and triglyceride levels, and regulation of blood pressure [e.g. arteriosclerosis and cerebral embolism].

E] Prevention of hyper pigmentation [age spots].

F] Immunostimulation, e.g. in the treatment of lassitude, leukocytopenia, and reduced immunity due to chronic hepatitis and radio-chemotherapy for malignant tumours.

G] Antiviral activity. Adjunctive treatment for AIDS patients. Grifola's antiviral activity was confirmed by both the Japan Institute of Health and the U.S. National Cancer Institute in 1992.

INONOTUS OBLIQUUS **Inon-o.**

Scientific name	Inonotus obliquus (Fr.) Pilat 1942.
Synonym	Polyporus obliquus Fr. 1821.
Common names	Black Birch Touchwood. Clinker Polypore. Chaga.
Family	Polyporaceae.

KEYS

- Parasitic-saprophytic canker conk.
- Black masses, as if charred or burned.
- Gastrointestinal disorders, including cancer.
- Combination of skin eruptions and gastrointestinal problems.
- Beginning and end; alpha and omega.

FEATURES

- White rot fungus causing severe damage.
- Forms black conks on living trees [parasitic], to develop annual fertile fruiting bodies under the bark or outer layers of wood surrounding sterile conks after the tree dies [saprophytic].
- Annual fruiting bodies form in summer and early fall. These are resupinate, have a grey to reddish-brown pore surface and quickly deteriorate through insect and weather damage.
- The conspicuous perennial conks are sterile, black masses with a rough, deeply scarred and cracked surface, resembling charred cloth or burned growths, which erupt from bark cankers.
- The spores dispersed by the annual fruiting bodies infect new living hosts through dead branch stubs, trunk wounds, or through pre-existing cankers, e.g. Nectria *[see* Nectrianinum].
- The annual phase is tiny, 1-3 mm thick, in comparison to the 12 by 6 inches of the black conks.
- Flesh [of sterile conks] yellow-brown to rust-brown.
- Tree trunk often thickened at the site of the conk.
- Found mainly on birch; occasionally on alder or beech.
- Widely distributed throughout the boreal forest ecosystem of the northern hemisphere.
- Used as tinder and can be made into a caffeine-free coffee substitute beverage.

THERAPEUTICS

• Inonotus obliquus contains a wide variety of active triterpenes, poly- sacharides and sterols. The Canadian Cree Indians tell that a forefather, holding a conk for dried meat, found it inedible and threw it against a tree, where it still hangs to the benefit of mankind. The Cree used the inner parts of the fungus as tinder and as moxibustion for arthritis.
It has long been used as a folk medicine in several East European countries including Russia, where it is referred to as Chaga. The folk uses of Chaga address many complaints such as gastritis, gastric ulcers, TB of the bones and glands, as well as stomach and lung cancer. Water decoctions were used in colonics for lower bowel problems. Following clinical investigations, the Russian Medical Research Council approved Chaga for public use against cancer in 1955. Chaga and its preparations [Befungin] are used to treat skin diseases, especially in the case when they are combined with inflammatory diseases of the stomach-intestinal tract, liver and biliary colic.
Aqueous extracts have shown a cytotoxic effect, inhibiting cancer cell growths in human cervical and uterine cancer.

> In Western Siberia, the Khanty people traditionally prepared chaga and still use the tea to treat tuberculosis, stomach ache, stomach disease, liver or heart disease, worms, and as an internal cleansing agent. In the form of "soap water," the fungus is used by women to make a wash for external cleansing of the genitals following or during menstruation; for cleansing new-born infants; for "ritual washing"; and as a soap substitute for washing the feet and hands or the whole body. Soap water is prepared by burning chaga until red and then placing the charred fungus in hot water and stirring until it breaks up, and the water turns black. ...
>
> A study in Poland with 48 patients having third and fourth stage malignancies found chaga injections with cobalt salts to be the most effective form of preparation. In ten of the patients, tumours reduced in size, pain decreased, haemorrhaging occurred less often and became less intense, and recovery was attended with better sleep and appetite and feelings of improvement. Most of these patients were women treated with chaga for cancer of the genital organs or breast cancer. Other clinical studies have been conducted in lung cancer patients with an aerosol preparation and in inoperable genital cancer in women with an extract of chaga administered by injection and suppository.
>
> [Hobbs, 1995]

Preparations made from chaga are believed to reduce the growth of both benign and malignant growths and help normalize activity in the intestinal tract. The extract is employed when the surgery and radiation are not deemed advisable, although it has been used as well during chemotherapy for cancer patients, in conjunction with a special diet based primarily on vegetables and diary products. Traditional Russian herbalists prefer collecting the fungus in autumn or spring.

> After harvesting, the fungus is cut into 3- to 6-cm pieces and dried in a well-ventilated dark room. It can also be laid out on a pan and dried in an oven set at 60° C. As it dries, the fungus will become more solid and firm and will take on a dark brown colour. It should be stored in a glass jar for a maximum of 2 years.
> [I.V. Zevin, *A Russian Herbal·,* Rochester, 1997]

BIRCH - BEGINNING AND END

Parasitic saprophyte canker conk.
Black masses, as if charred or burned.
Gastrointestinal disorders, including cancer.
Combination of skin eruptions and gastrointestinal problems.
Beginning and end; alpha and omega.

* It is thought that only conks collected from birch show proper pharmacological activity, which is attributed to the selective affinity of betulinic acid [from Betula, birch] for tumour cells. The interior pH of tumour growths is generally lower than that of normal tissues, and betulinic acid is specifically active at those lower levels, inducing programmed cell death in the tumour.

It seems fair to say that the penchant of certain fungi for Betula goes beyond chemistry. The lightness and the affinity with water of birch-woods is welcoming to many forms of fungi, such as Lactarius, Boletus, Tricholoma, Cantharellus, etc., but these will feel equally at home under other deciduous trees. In decreasing degree three species are host-specific with Betula.

First and foremost Piptoporus betulinus *[see],* then Inonotus obliquus, and finally Amanita muscaria. Inonotus is most frespecies, whilst Amanita muscaria is the most noticeable birch species of the fleshy higher fungi, although it also occurs under pines.

However, the relationship of these three with the birch is totally different. Betula is a colonizer or pioneer, and as such it was one of the earliest tree species to colonize Scandinavia, Western Europe, Ireland and Great Britain

after the last Ice Age. Prodigious seed production and a very fast growth are qualities that enable Betula to act as a colonizer. Barren and rough conditions are to its advantage because an assemblage of fungal associates allows Betula to derive nourishment from the poorest of soils. Here, at the starting up of things, appears Amanita muscaria on the stage. “Birch is the tree to select for the undertaking of new projects.

“The birch month immediately follows Samhain, the Celtic New Year. Her clean white bark is easily seen and makes a clear marker in a thickly grown forest. She will point the way to a clear purpose and a fresh start in life,” writes Ellen Evert Hopman in *Tree Medicine, Tree Magic.* Fresh starts and new projects equally appeal to Amanita muscaria.

Whereas the birch in Russia symbolizes Spring and the Maiden, Scandinavian and Teutonic lore have it that the “last battle in the world will be fought round a birch tree.” In the Celtic world the symbolism of the birch also had a funerary aspect, as demonstrated by the Welsh poem, *The Battle of the Trees,* describing a fierce battle and ending with the remark that “the top of the birch tree covered us with leaves; he changed and transformed our withered state.” This appears to mean, “The birch works the changes which prepare the dead for their new lives.”

Birch kindling was used in Scotland to set alight a ritual fire at the rising of May’s first sun, the traditional start to the warmer half of the year. To drive out the cold corresponds with Betula representing “the significance of the beginning of things; it beat the bounds, it expelled evil, it drove out the spirit of the old year,” as Ross Nichols puts it.

Betula and Amanita muscaria share the symbolism of commencement. At the other end stands the association of Betula with Piptoporus and Inonotus. Both fungi are related to death, the last battle, and cancer. As remedies, however, they offer the chance of a new life.

The black conks of Inonotus not only look like cancerous growths, the fungus also displays the course of cancer. It begins insidiously, spreads its mycelium throughout the host, eating away the wood, and eventually protrudes black masses as the final products of its invasion. The hyphae of Piptoporus will have invaded the tree long before its death is announced by the appearance of the fruiting bodies. By then the resistance of the tree is thoroughly weakened.

Tree symbolism in general can be applied to polypores, because they find in trees their only suitable substrate for existence, whilst the rare occurrence of host specificity allows for symbolism more concentrated on the specific host.

PIPTOPORUS BETULINUS **Pipt-b.**

Scientific name Piptosporus betulinus (Bull: Ft.) P. Karsten 1881.
Synonym Boletus betulinus Bull. 1787.
Polyporus betulinus (Bull.) Fr. 1821.
Common names Birch Conk. Birch Polypore. Razor Strop Polypore. **Family** Polyporaceae.

KEYS

- Annual bracket fungus growing exclusively on dead or dying birch trees.
- Fast development.
- Sour smell and taste.
- Smoulders slowly but persistently when used as tinder [similar to charcoal].
- Deathbed. Reviver.
- Anthelmintic. Bowel problems.
- Tumours.
- Encompasses the symbolism of the birch.

FEATURES

- Bracket fungus growing exclusively on dead or dying birch trees.
- Annual; possesses only one tube layer. Remains intact over the winter [or longer] and may in the spring be attacked by the fungus Hypocrea pulvinata. Since this saprobe further only occurs on dead fruiting bodies of Fomitopsis pinicola, this might indicate a relationship between the two polypores. *[See* Polyporus pinicola].
- Can grow to surprisingly large dimensions during a short [Scandinavian] summer.
- Causes brown rot.
- Starts as a small whitish spherical knob, becomes shelf-like or hoof-like at maturity. Closely resembles an alien spacecraft.
- Upper surface leathery, smooth, pale brownish to greyish silver; margin blunt, inrolled.
- Flesh white, corky; sour smell and taste.
- Used as tinder; smoulders slowly and persistently; “slow torch.” Natives of north Siberia use the fungus for moxibustion.
- Displays, like other bracket fungi, the phenomenon of geotropism, i.e. always directs its lower [pore] surface towards the centre of the earth, and

will slowly resume its original position when turned.

- Common throughout the range of birch.
- Made into small balls by Scandinavian children; the balls are remarkably durable and "can take much wear and tear before having to be replaced."

DEATHBED

- There are several reasons to compare Piptosporus betulinus with Carbo vegetabilis from point of view of the Doctrine of Signatures. The fungus is regarded a "weakness parasite" because it attacks birches with decreased resistance. Since its appearance announces the death of its host, this polypore could be dubbed "deathbed fungus." Its appearance conveys a death-notice, a notion supported by the fact that Piptoporus is an annual species, i.e. its fruiting body lives for a year [although it remains intact for a longer period]. A personal experience will illustrate this. We have many birch trees on our property, ranging in size from small to tall and in age from young to old. Some years ago a winter tempest brought one birch down, leaving all others unharmed. On the fallen birch several Piptoporus specimens were growing, whilst there were none on the others.

The deathlike condition that the fungus represents brings to mind a remedy with a certain reputation for reviving the near-dead: Carbo vegetabilis. Carbo vegetabilis is charcoal made of birch [or beech]. Hahnemann did his provings with birch charcoal. As the residue of birch wood, charcoal has undergone combustion with exclusion of air.

There is still some fire left in charcoal, but not much, it smoulders as a slow torch, similar to the Carbo vegetabilis condition. ["Op een laag pitje staan," the Dutch say, which translates as "simmering on a low flame."] By increasing the oxygen supply the fire will burn higher, which corresponds in the Carbo vegetabilis patient with the improvement by fanning. The similarities with Piptoporus are interesting. Firstly, the species grows exclusively on birch; secondly, employed as tinder, the fungus will slowly but persistently smoulder "if placed in a tin with restricted ventilation."

THERAPEUTICS

- Not much is known about the medicinal virtues of P. betulinus aside from its traditional use as a styptic and laxative. The latter effect is due to the presence of agaric acid, a powerful purgative also found in Fomitopsis spp.

It is also known to produce pharmacologically active substances that reduce
fatigue and soothe the mind. Triterpenes from the fruiting body have shown antimicrobial, antineoplastic, and antiphlogistic effects in experimental animals. Vaginal tumours in female dogs were observed to completely disappear after 5 weeks of daily administration of an extract of the fungus. Recently a new antibiotic, piptamine, has been isolated from Piptoporus that has shown antimicrobial activity against some Gram positive bacteria, yeasts [Candida albicans], and fungi.

Annual, growing exclusively on dead or dying birch trees. Fast development. Sour smell and taste. Smoulders slowly but persistently when used as tinder [similar to charcoal]. Deathbed. Reviver. Anthelmintic. Bowel problems. Tumours. Encompasses the symbolism of the birch.

The Ice Man, nicknamed Oetzi or Frozen Fritz, may have known about the antibiotic properties of the polypore for he, setting off on a trek across the Tyrolean mountains, carried with him a grass pouch containing two walnut-sized pieces of the birch fungus. Oetzi went on his expedition some fifty-three centuries ago, but somehow got stuck and died where he lay. Freeze-dried by the wind, the glacier of which he became part preserved his remains until he was found in 1991 in the then retreating ice mass.

The remains were examined and eggs of an intestinal worm caused Oetzi abdominal pain and diarrhoea. In addition experts discovered that Oetzi had been afflicted by arthritis. “The presence of the fungus suggests that the Ice Man was aware of his intestinal parasites and fought them with measured doses of Piptoporus betulinus,” Professor Capasso wrote in the Lancet [Vol. 352, December 5, 1999].

[Maybe he simply used the fungus as tinder. Ed.]

PYCNOPORUS SANGUINEUS **Pycn-s.**

Scientific name Pycnoporus sanguineus (L.: Fr.) Murrill 1904.
Synonyms Boletus sanguineus L. 1762.
Polystictus sanguineus (L.) G. Mey. 1818.
Trametes sanguinea (L.) Lloyd 1924.
Common names Red Polypore. Scarlet Shelf Fungus.
Family Polyporaceae.

KEYS

- Saprophytic wood decay fungus.
- Shades of bright orange and red.
- Relatively rich in natrum and ferrum.
- Sore, ulcers, thrush; eczema.
- Rheumatic disorders.
- Sharp pains.
- Easily annoyed. Disorder annoys. Annoying itchiness.

FEATURES

- Annual to biennial wood decay [white rot] fungus.
- Leathery when fresh, corky when dry.
- Surface, pores and flesh some shade of bright red, fading with age.
- Solitary or in groups on fallen, dead wood.
- Relatively rich in natrum and ferrum.
- Saprophytic.
- Common in most tropical and subtropical countries.
- Within the genus Pycnoporus there are three species, all producing bright orange, bracket-like fruiting bodies. In general terms Pycnoporus cinnabar- inus is found throughout the temperate areas of the northern hemisphere, Pycnoporus sanguineus in the tropical and sub-tropical areas and Pycnoporus coccineus in the temperate areas of the southern hemisphere.

THERAPEUTICS

- Australian desert Aborigines suck on a piece of the fungus when it is mature and red in colour to cure sore mouths. It is rubbed inside the mouths of babies with oral thrush. It has also been used as a teething ring.

Small portions of the fungus are moistened and dabbed onto sores on the lips or gums. The fungus is not used as food. It produces an irritant smoke when burned. [Traditional Aboriginal Medicines; Darwin, 1993]

• Popularly used throughout China and recommended in TCM to lower fever, reduce dampness and swelling, and as an antidote for toxins. A decoction of the fruiting body is recommended for rheumatism, arthritis, gout, and fungus diseases. Externally, the finely powdered fungus is used as a styptic and to prevent infections. It is also said to invigorate the body's vital energy, activate the blood circulation, and stop itching. Used in Malaysia to alleviate pimples and skin ailments when there is a red colour; in Johore as a topical application for leprous tubercles and eczema; and in Java for symptoms associated with venereal disease and colic, as well as an application with warm oil for knotty swellings. A cultured mycelium filtrate and an aqueous extract of the fruiting body has been found active against Staphylococcus aureus, S. albus, Streptococcus salivarius, Pseudomonas aeruginosa, Salmonella paratyphi, E. coli, and Shigella paradysenteriae. [Hobbs, 1995]

• Pycnoporus can synthesize vanillin from lignin. Vanillin is extensively used in the food industry, as a flavouring agent for chocolate, ice cream, pastries, dairy products, candy, etc. It is made synthetically from the waste [lignin!] of the wood pulp industry. The compound is a skin irritant that produces a burning sensation and eczema, and also may cause pigmentation of the skin. This makes the topical application of Pycnoporus for eczema and other skin problems more or less homeopathic.

MATERIA MEDICA

Sources

[1] Proving Catherine Anne Morris, South Africa; 30 provers [15 provers - 11 females, 4 males - received verum, the other 15 placebo]; double blind, placebo-controlled; 30c, thrice daily, intake discontinued after the onset of proving symptoms or if no symptoms were experienced after 7 days of taking the substance; 2002. [M]

A total of 423 symptoms was produced; most fundamentally affected were the Mind, with 98 symptoms; Generalities, with 56 symptoms; the Stomach, with 35 symptoms; Dreams, with 34 symptoms; the Head, with

29 symptoms; the Skin, with 26 symptoms, and the Extremities, with 18 symptoms.

[2] C-4 triturations conducted in Brisbane, Australia [6 persons] [B], and Stockholm, Sweden [10 persons] [S]. The results of the triturations, admitted with caution, coincide interestingly with those of the classical proving.

SYMPTOMS

MIND

Irritability - aversion company.

Most marked were the intense feelings of irritability and frustration. This emotion ranged from short-tempered and snappiness, to profound irritation with the desire to scream and shout and actually be quite vengeful to those with whom the provers were irritated. With this irritability came an aversion to company [as everyone was irritating] and impatience with respect to petty domestic chores and how they were to be precisely carried out. [M]

Dreams of violence and arguments.

Some dreams were of arguments and violent acts. The response of the dreamer was horror at the ability to have such violent thoughts and to do, or want to do, such violent deeds. This theme also mimicked the same prover's mental state, where she was having violent thoughts about people. [M]

Saprophytic wood decay fungus.
Shades of bright orange and red.
Relatively rich in natrum and ferrum.
Sore, ulcers, thrush; eczema.
Rheumatic disorders.
Sharp pains.
Easily annoyed.
Disorder annoys.
Annoying itchiness.

Desire for solitude; want to be left alone. [S]

Annoyed, irritable - feel like kicking someone. [B]

Irritated with people looking at me, irritated with their slowness - 'leave me be' kind of feeling. [B]

Anger felt in solar plexus - tense and don't know why. [B] Irritation - feeling rushed. Want to slow down and just sit. [B] Want to tell them all to shut up - irritable [B]

"Have gotten rid of them all. Feel like a hillbilly murderer. I'll just clean up this blood." [B]

Intensity felt — is it anger or a hurried/rushed feeling? [B] Feeling a need to yell or scream. [B]

Have a need to frown and wrinkle nose, in anger and irritation. [3 provers] [B]
Losing connection to reality, getting caught up with the images in my head of personal conflicts with others. [B]

~ *Exacting - tidiness.*

... impatience with respect to petty domestic chores and how they were to be precisely carried out. This is evident in their increased energy and fervour in cleaning and tidying. They found themselves tidying things again and again, until they were 'just right' and felt very irritated when others messed them up. This irritation was so overwhelming that they had to actually remove themselves from the company of others and had to mentally restrain themselves from losing their temper and retaliating in anger. [M]

Need for neatness; wanted things neat and tidy. [B]
Sensation — don't want the substance on me - it's irritating. [B]
Every time powder spills I get ticked off - don't want powder touching me. [B]

= *Irritability accompanied by sadness.*

Along with this irritability was a marked sense of sadness and depression. This sensitivity ranged from a heightened emotional sensitivity to others and bad news, to intense feelings of depression, loneliness and isolation from others. Together with this depression came a desire for solitude, which ended up perpetuating the depression and increasing the sadness. They experienced a sensitivity to criticism and took offence easily, which made them lose their temper and also cry easily, once again spiralling into the desire to be alone and then the depression and loneliness. [M]

Can feel a lump welling up in my throat - Feeling of sadness and tears. [B]
Laughing makes a lump well up in my throat and I feel a desire to cry. [B] Initially felt like giggling and quickly turned to a desire to weep. [B] Anger and sadness, desire to cry, rant and rave. [B]
Sad and very pissed off at the same time. [B]
Each yawn leeches anger from me. [B]

= *Depression resultingin demotivation, feelings of self-doubt, and a law self-image.*

A further complication of this depression was significant apathy, demotivation, decreased energy and difficult concentration. ... Other emotions related to the depression were the development of feelings of self-doubt,

worthlessness, a very low self-confidence, and a low self-image. They even began doubting the worthiness of their own opinions, which caused them to withdraw from others [perpetuating their feelings of isolation and depression] and became insecure and indecisive. They became quiet and unassuming and even begun to think of themselves as ugly and unattractive. [M]

== *Mistakes - awkwardness.*

Another aspect, which relates to the depleted self-image, is the fact that many mistakes were made. Mistakes in talking, using incorrect words without even realising; mistakes in writing; clumsiness and bumping into things and repeatedly making big mistakes in the timing of events, appointments and dates. It is almost as there was such a level of self-doubt, that their subconscious mind could not even function in the correct order, it could not even trust itself to do anything correctly. [M]

Difficulty spelling. [B]

Dreams

= *Danger and nightmares.*

A sense of danger permeated many of the dreams, ranging from personal danger to others that were in danger and trying to rescue them. Many of the dreams started out pleasant and then had a strange twist to them that left the dreamer frightened and/or anxious. Although some dreams were not remembered in detail, the pervading sense of fear remained on waking. Some dreams were so disturbing that the dreamer was afraid to go back to sleep in case they dreamed more, and in some instances couldn't get back to sleep at all. [M]

= *Helplessness and Insecurity.* [M]

= *Aliens.*

Of aliens converting humans and planning to take over the world. [1 prover] [M] Of marrying an alien, in spite of it being of the same gender [female]. [1 prover] [M]

GENERALS

Energy

~ *Fatigue,* tiredness, weakness; most prominent during the day, esp. the morning; must sleep during the day in order to be able to continue the day's routine. [M]
— Anger fading, sadness still present — feeling very drained. [B]
= Starting to feel incredibly drained. [B]
« Incredibly tired. [4 provers] [S]

Body temperature

« Feverishness & perspiration and alternating feelings of hot and cold. [M]
<= Bead-like perspiration on forehead. [M]
» Drenched in sweat, or dry heat without perspiration. [M]
== *Feeling of hot and cold,* often felt simultaneously in different parts of the body, i.e. hot head and cold body. [M]
= The prevailing sensation was of cold and inability to get warm. [M]
= Cheeks alternately hot and cold - feel swollen/chubby. [B]
= Cold shivers up anus/spine and arms. [B]
~ Powerful shivers up right side of spine, forces me to bend forward. [B]

Food & Drinks

No significant food cravings or aversions were noted; however, some provers found themselves craving a sweet taste, while sweet things were actually tasting bitter. There was a strong craving for junk food in one prover and another had a strong craving for butternut [type of pumpkin] soup. One prover also developed a dislike and aggravation from cold water.

Some provers experienced a complete thirstlessness [almost to the point of dehydration], while others experienced an increase in thirst.

Similarly the appetite: a decrease in appetite with easy satiety or an increase in appetite to the point of being ravenously hungry. [M]

Pains

= Sharp, needle-like or as from pin-pricks
in ears as from needles being pushed in and out;
in bladder;
in right ovarian region;
from rib cage into breast under nipple;

right hand side of chest - sudden, sharp and almost ‘angina-like’ pains; back, region of left kidney - sharp gnawing pain extending down left leg to knee]. [M]

Sharp pains, in many different places, were a common occurrence during the C-4 trituration.
= Stabbing/ shooting inwards in left temple. [B]
= Sharp pain in right temple. [B]
= Sharp pain above right eye; pain moves to same side on left side and is sharp. [B]
= Sharp pain above left eye upon closing eyes. [B]
= Short, stabbing pains in left eye. [B]
= Sharp pain down right/middle of abdomen. [B]
® Stabbing pain under left ribs. [B]
= Sharp pain under right scapula. [B]
» Sharp pain left ankle. [B]

LOCALS

Head
<= Dull headache without a prominent location; shifting to different areas of the head, not often being in the same place.
< Any movement or jar.
> External pressure.
& Stiffness of neck. [M]
~ Headache across top of head - pushing down sensation. [B]

Stomach
=» Gastritis-type sensation.
Burning sensation in epigastrium, which seemed to rise into the oesophagus like reflux. Slightly > by eructations, cold water, and eating. [M]
~ Intense cold sensation coursing down the oesophagus, “like a cold burning” or “as if air was stuck in the oesophagus,” > eructations. [M]

Extremities
= Weakness and heaviness, to the point of actual shakiness and giddiness with fainting sensation.
Movements somewhat uncoordinated; limbs go numb easily. [M]

Numbness of single parts, arms or legs. [M]
= Complete numbness of one half of body, awakening her from sleep. [1 prover] [M]

Skin

= Most striking of all the skin symptoms was the intolerable itch developed by many of the provers. So striking was this symptom that it warrants a grading of 3 in the repertory. Many provers experienced the itch like that of fleabites which was temporarily relieved by scratching. Some provers, however, found the itch to be completely intolerable and they found no amelioration from it. The itch was found to be quite deep in character and therefore, no superficial scratching relieved it. The itching sensation was not localised to any specific area, but spanned the entire body. No eruption was noted, just the sensation experienced.
Intense hyperaesthesia of the left buttock and the left hypogastrium was noted by one prover which was worse for the slightest touch, especially that of clothes. This symptom lingered for many days without altering in quality. Some tingling/ prickling sensations were also experienced. These were related to feelings of feverishness. [M]
« Itching > cold air. [M]
« Self-conscious about skin, what it looks like - flares when I think about it. [B]

Itchiness was a distinctly annoying feature during the trituration, occurring in nearly all provers:
= Slight itch on scalp top and rear of head. [B]
= Left eye is itchy [next to nose], [B]
= Itching feeling in R. eye. [B]
= Itchy face and nose. [B]
= Itch in left shoulder. [B]
= Itching left scapula. [S]
=* Little itches that need scratching - upper right arm. [B]
= Itchy in right hand above thumb. [B]
= During the C3 and C4 I had a constant itching feeling all over my body. [B] = Itching in small spots shoulder and external throat. [S]
» Itching localised or all over; several provers. [S]

STRANGE, RARE and PECULIAR

= Feeling of light pressure on head; sensation as if upper half of brain is light as air while the lower half is heavy like lead. [M]
» Strange feeling of light-headedness and a fullness of the cranium, esp. at the vertex. [M]
·» Excessive sneezing after a hot bath. [M]
·» 'Pulling' or 'drawing down' sensation in maxillary sinuses and cheeks [cheeks also feel numb]. [M]
= Sensation as if something were quickly gripping my heart [yet felt on right side of chest]. [M]
~ Feeling of bugs [gnats] being attracted to me. [B]
<= Sensation of the whole top of my head being lifted off. [B]
» Sensation of the scalp being pulled up. [B]
<= Smiling actually hurts! It's a cramping pain in the face. ... Smiling still hurts, now also hurts in forehead - like a band of pressure across it. ... While smiling still hurts, laughing hurts more! Band of pressure across forehead. [B]
= My eyes feel like they don't belong to me. [B]
= Sensation of a hair in eyes, mainly right-sided. [B]
<· Deep bone pain ascending from right ankle up to hip. [B]

TRAMETES VERSICOLOR **Tram-v.**

Scientific name Trametes versicolor (L.: Fr.) Pilat 1936.
Synonyms Boletus versicolor L. 1753.
Polyporus versicolor (L.) Fr. 1821.
Polystictus versicolor (L.) Fr. 1851.
Coriolus versicolor (L.) Quelet 1886.
Common names Turkey Tail. Multicolour Polypore. Rainbow Bracket. **Family** Polyporaceae.

KEYS

- Prolific, saprophytic wood-decaying fungus.
- Rainbow colours in exposed situations; more uniformly coloured in sheltered situations.
- Favours damp, shady places.
- Zonates its territory within the wood.
- Ringworm.
- Tumours.
- Darkening of the fingernails.

FEATURES

- Annual but persistent wood-decaying fungus.
- Causes white rot [decays the brown lignin and leaves the white cellulose behind],
- Fruiting body fan to rosette-shaped, thin and leathery when fresh, rigid when dry; white margin.
- Surface alternately in zones covered with fine hairs or silky-smooth.
- Strongly zoned with narrow, concentric bands of contrasting rainbow colours, often lustrous. “The multiplicity of colours is both its most bewildering and most distinctive characteristic - no two are coloured quite alike.” [Arora]
- More uniformly coloured in sheltered situations. [Arora]
- Flesh very thin, tough, corky, white.
- Individual specimens zonate their ‘territory’ within the wood.
- Very prolific. Typically in groups, rows, tiers, shelving masses, or overlapping clusters on logs, stumps, and fallen branches of dead hardwoods [particularly oak]. [Arora]

- Favours damp, shady places.
- Saprophytic; sometimes parasitic on wounded fruit trees and lilac bushes.
- Widespread and very common.
- Known as ‘Elfenbankje’ [fairy bench] in Holland and ‘Schmetter- lingstramete’ [butterfly tramete] in Germany.
- Yields manganese peroxidase, a compound used for bio-bleaching.

Trametes suaveolens is much less common than Trametes versicolor. Favouring swamplands, it is annual [but persistent] and grows on dead or occasionally living deciduous trees, notably poplar and willow. The upper side is velvety and snow white to ochre; the flesh is corky, tough, white, with an anise-like scent [suaveolens means ‘sweet-scented’] when fresh and smelling of iodine when dried.

Prolific, saprophytic wood-decaying fungus.
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Zonates its territory within the wood.
Ringworm.
Tumours.
Darkening of the fingernails.

The species has a listing in the repertory index but no symptoms. Reports of its use are equally as infrequent as its occurrence. Hobbs has this to say about it: “One of the most widely used of medicinal fungi for tuberculosis was *Coriolellus suaveolens [= Trametes suaveolens].* It was highly recommended by a number of French and German doctors of the time as a cure for this ailment; several cases were reported in Porcher that had been given up as incurable and then completely recovered. Two drams of the powder were given morning and evening to affect a cure.”

As an example may serve the case of “a young man of twenty-one, [who] was seized at the beginning of autumn with inflammatory cough and haemoptysis, which were partially subdued by V.S. and the ordinary antiphlogistic treatment; but the cough, coming on again with renewed severity during the winter, was accompanied by the expulsion of glairy mucus, which was sometimes specked with blood.

Towards the spring the young man had become much thinner, and was continuing to waste away; the expectoration also had changed its colour, and had become fetid and green; his nights were feverish and disturbed; he had no desire for food, and ate but little; his ankles had begun to swell; he had copious night-sweats and diarrhoea. A teaspoonful of an electuary of the Polyporus *suaveolens* in honey was given three times a day, and nothing else; and, extraordinary as it may appear, under this treatment the sweat speedily began to diminish with the cough, and after a three months’ continuance of

the medicine the patient entirely recovered." [cited in C.D. Badham, *A Treatise on the Esculent Funguses of England,* 1847]

Linnaeus, while studying the flora of Lapland, observed that young Lappish men used to carry specimens of the fungus hanging from their waists. "The Lapland youth having found this Agaric, carefully keeps it in a pouch hanging in front of his pubes, that its grateful perfume may render him more acceptable to his favoured fair-one. O whimsical Venus!

In other regions you must be treated with coffee and chocolate, preserves and sweetmeats, wines and dainties, jewels and pearls, gold and silver, silks and cosmetics, balls and assemblies, music and theatrical exhibitions: here you are satisfied with a little withered fungus!"

In the repertory this species is listed as "Boletus suaveolens" [Bol-su.] since all polypores formerly were classified as boletes.

THERAPEUTICS

• Used in Mexico as a topical agent for impetigo and ringworm and in traditional Chinese medicine for lung infections, excess phlegm, and hepatitis. Commonly known in Japan as *Ka.warata.ke* [riverbank mushroom] and in China as *Yun zhi* [raincloud fungus], Trametes versicolor is one of the first medicinal mushrooms to have an active compound extracted from it and prescribed as a drug. The compound is called PSK [polysaccharide-K; K stands for Kureha Chemical, the company developing it], the drug is known as Krestin. The success of Krestin inspired researchers in Shanghai to produce another protein-bound polysaccharide [proteoglycan] from T. vesicolor, called PSP [polysaccharide peptide].

Both polysaccharide preparations have documented antineoplastic activity in vitro, in vivo and in human clinical trials. The merits of PSK, with three decades of clinical experience, are impressive. The only significant side effect of PSK is occasional darkening of the fingernails. The drug is clinically indicated for cancers of the stomach, oesophagus, nasopharynx, colon, rectum, and lung. Trametes potentially has the ability to improve the "host versus tumour response," thereby increasing the ability of the host to defend itself against tumour progression.

Clinical research with PSP has taken a fast track since it was isolated in 1983.

In the Phase II double-blind trial, conducted in 1992 at several hospitals in Shanghai, 274 patients with stomach, oesophageal, or lung cancers were

dosed with PSP or shark liver oil [batyl alcohol]. Patients received conventional anticancer therapies [radiotherapy and/or chemotherapy], following surgery where appropriate. The PSP dose was 3.1 grams/day, the batyl alcohol 450 mg/day, taken by mouth before meals for two months.

Effectiveness was judged by marked improvement of clinical symptoms together with; [a] significant improvement in blood profiles [white cell count, other] and/or immune indices; and/or [b] significant improvement in Karnovsky performance status or body weight. If none of these criteria for effectiveness was met in a patient at the end of the trial period [six months], the treatment was judged ineffective. PSP was found effective for 82% of the patients versus 45% for batyl alcohol. PSP improved clinical symptoms overall.

PSP alleviated symptoms commonly associated with cancer, including fatigue, anorexia, dryness of mouth or throat, nausea, thirst, cold sweat, and pain. PSP also alleviated the severity of systemic toxic deterioration associated with conventional therapies, stabilized or increased body weight, and significantly improved overall immune status. [In another double-blind trial] PSP lessened fatigue in the greatest number of patients [81 %] and pain in the least number [26%].

[Parris M. Kidd, *The Use of Mushroom Glucans and Proteoglycans in Cancer Treatment*, www.thorne.com/altmedrev/fulltext/cancer5-l.html]

III. ORDER BOLETALES

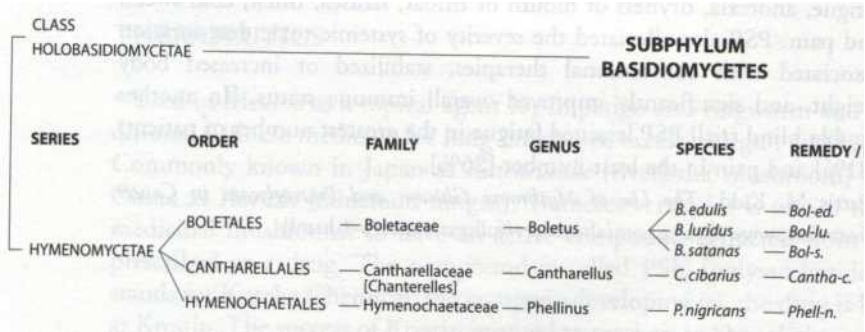
III A. FAMILY

Boletus edulis
Boletus laricis
Boletus luridus
Boletus sanguineus
Boletus satanas
Boletus suaveolens

[- Fomitopsis officinalis; *see* Polyporus officinalis]

[= Pycnoporus sanguineus; *see*\

[= Trametes suaveolens; *see* Trametes versicolor]



BOLETUS EDULIS

Bol-ed.

Scientific name Boletus edulis Bull: Fr. 1782.
Common names King Bolete. Penny Bun.
Family Boletaceae.

KEYS

- Mutualistic [symbiotic],
- Delicate pinkish network of fine lines on upper part of stalk.
- Alternately abundant and rare.
- Puzzling variableness.
- The King - “the one aristocrat the peasantry can eat.”

- Little pig - the King reduced to vulgarity.
- Eases the tendons.
- Gastrointestinal upsets.

FEATURES

- Cap smooth, like well-buffed leather; viscid when moist; light brown to dark reddish brown.
- Pores whitish initially, becoming yellow to olive-green with age. Spores olive brown.
- Flesh white, sometimes tinged yellowish in age; not blueing when bruised.
- Delicate pinkish network of fine lines on upper part of stalk.
- Taste nutty; "mildly sweet, pleasant mushroom" fragrance.
- Solitary, scattered, or in groups.
- Widely distributed; summer to fall.
- Infrequent occurrence: one year abundant, especially in young coniferous forests, the next year rare or absent.
- Mycorrhizal symbionts: coniferous trees [spruce, pine, hemlock, fir], occasionally deciduous trees [oak, beech, birch].
- Summer to fall.
- Not easy to find because "you have to hunt them down and root them up from under the duff before they're visible to others" and because "you face formidable competition from both maggots and boletivores [major predators and stalkers of Boletus edulis which come in the varieties 'clandestinus' and 'brutalosipes']." [Arora]

- Some species of fungi appear to have that prize of Fairyland - the Wishing Cap - and by its power be able to take on any form they please. Boletus edulis is one of them. Its variableness is puzzling." [Mcllvaine]

KING

Mushroom lovers invariably are profuse in their praise for Boletus edulis, known worldwide as one of the best edibles and a superior kind of mushroom. "Equally acceptable to the plain and to the accomplished cook; imparts a relish alike to the homely hash and the dainty ragout and may be truly said to improve every dish of which it is a constituent."
The celebrated *cep* of France, the *Steinpilz* ["stone mushroom"] of Germany,

the *porcini* of Italy, is called the *king bolete* in English speaking countries and *Karljohan* in Scandinavia, after King Karl XIV Johan, who introduced the sophisticated French mushroom cuisine in Sweden in 1881. Before the King's intervention the fungus was known as *stensopp,* "stone mushroom," but being the King's favourite it once again became suitable for the fine palates of both nobility and persons devoted to luxury. "If any mushroom deserves the dubious title of'king,' this is the one. It is a consummate creation, the peerless epitome of earthbound substance, a bald bulbous pillar of thick white flesh - the one aristocrat the peasantry can eat!" David Arora doesn't stand alone in prizing the gastronomic repute of the "king of the kitchen," being preceded by Roman writers some two thousand years ago, although the identity of their "boleti" has been disputed.

> Pliny [23-79 AD] paints a vivid picture of the manner in which boleti and some other fungi were regarded, and in his remarks on the cooking of fungi, he says that these were "the only food which dainty voluptuaries themselves prepare with their own hands, and thus, as it were, by anticipation feed on them, using amber knives and silver service." Juvenal, who flourished towards the close of the first century AD, regretfully says: "Nor will that youth allow any relative to hope better of him who has learnt to peel truffles and to pickle boleti."
>
> Fungus Luxuries of the Romans. In the cooking of boleti, special vessels, called *boletaria,* were used, and these were not to be employed for more ignoble purposes. Martial [43-104 AD], in an Epigram, depicts one of these vessels as bewailing its fallen state in the functions of a Roman kitchen: "Although boleti have given me so noble a name, I am now used, I am ashamed to say, for Brussels sprouts."
>
> In the opinion of Martial, boleti were very great delicacies, which, if sent as a gift to a friend, should never be entrusted to a slave, for he would most certainly devour them on the way, although gold and silver might safely be committed to his care.
>
> Juvenal refers specifically only to the boleti and describes all other fungi as "ancipites": "Doubtful fungi shall be served to his clients, the boletus to the lordly patron." [Rolfe & Rolfe 1925]

Rolfe and Rolfe claim that the Romans applied the term bolete to the species Amanita caesarea. One of their arguments is that the Latin word *boletus*

doesn't indicate a particular fungus but derives from the Greek word for "edible mushroom." Boletus edulis would have been one of the fungi the Romans referred to as *suilli,* "hog-fungi," so called because swine are fond of them and still reflected in the Italian common name *porcini,* meaning "little pigs." A king reduced to vulgarity, but now re-established as the king of the kitchen and "the one aristocrat that peasantry can eat." After all, pigs should not be sniffed at in such matters, because particularly sows are able to discover that other equally prized fungus as well, the truffle. [The reason why dogs are entrusted with this task is because pigs are less easy to convince to give up their find.]

BOLETIVORES

Instead of just enumerating symptoms a homeopathic materia medica may furnish information that is indirectly connected with the subject. Just like ingesting fungi will produce symptoms in persons susceptible to them, fungi bring about specific responses in some people by their mere presence. Both symptoms and responses typify the individual relationship between person and fungus.
Harvesting king boletes is a form of treasure hunting. "Stories of the western king bolete bring tears to the eyes," admits one dedicated mushroomer. The object of one's desires may induce peculiar behaviour. Bovista is listed as "secretive" and Agaricus "reveals secrets", whereas the king bolete hunter appears to conceal or to reveal in equal measure. The citation below discloses in a witty and slightly acid fashion the behaviour people may exhibit when hunting for king boletes. Although intended as a light-hearted interlude, it happens to reveal a few aspects of what I regard as "mushroom behaviour."

> Boletivores appear shortly after the onset of the rainy season, not coincidentally, at the same time *Boletus edulis* appears. As a group they share a number of telltale traits which the experienced observer can discern at a glance. ... [Those] retreating furtively when approached [belong to the species] *Boletivorus clandestinus.* [Those] advancing boldly when approached [belong to] *Boletivorus brutalosipes. Boletivorus clandestinus* is the more common of the two species. In addition to its secretive nature, it can be recognized [if you can get close enough!] by its tough, wizened stalk with a persistent, even permanent, stoop.
> The gait is also highly distinctive: curiously hitched and truncated,

marvellously efficient, yet flailing and disjointed. The overall impression is that of a creature completely immersed in, yet not designed for, its element - like a kayaker trying to negotiate a rapids without wetting her back. When one is crept up on unawares, it can be heard alternately cooing to and swearing at its prospective prey in a vaguely familiar, yet unintelligible, tongue.

This species occurs solitary to scattered or in small groups in the woods, but always near the road. There is usually a rusty pick-up truck, station wagon, or '65 Dodge Dart nearby, parked on the side of the road. Near the vehicle will be found one or more telltale "middens" - neat piles of discarded tubes and wormy stalks.

These resemble the feathers that remain from a freshly and systematically disembowelled bird - positive proof of boletivores' singular lust and unbridled craving for their quarry.

Boletivorus brutalosipes [the "Brutal-Footed Boletivore"], on the other hand, can be instantly recognized by its inquisitiveness, its bold advance and cavalier stance. In addition, the stalk is more fleshy than that of *Boletivorus clandestinus* - often swollen in the middle or even bulbous. The gait is decidedly more compact, the stride purposeful, yet completely arbitrary. When one comes rushing toward you, the net effect is that of a rapid intent upon wetting *your* back.

Its insatiable greed for *Boletus edulis* may be cleverly disguised by an amicable disposition and disarmingly friendly, fibrillose smile. But it will stop at nothing to achieve its ends, so never leave your basket unattended in the woods! If there are *Boletus edulis* in it, they will be gone, and other species will be stepped on, masticated and regurgitated, or otherwise obliterated. Trampled fly agarics *[Amanita muscaria},* incidentally, are a sure sign that brutal-footed boletivores are in the vicinity! *Boletivorus brutalosipes* is found in roughly the same habitats as *Boletivorus clandestinus,* but fortunately, is not as common. Invariably there is a rusty pick-up truck, station wagon, or '65 Dodge Dart nearby, parked in the *middle* of the road, and the discarded tubes and wormy stalks of its quarry are apt to be haphazardly strewn about rather than stacked in the "middens" characteristic of *Boletus clandestinus.*

Boletivorus clandestinus is probably harmless, though I haven't been able to get close enough to find out. *Boletivorus brutalosipes,* on the other hand, has a well-deserved reputation for unprovoked acts of aggression.

[Arora 1986]

CLINICAL MANIFESTATIONS

The clinical effects recorded for Boletus edulis are limited to non-specific gastrointestinal irritation - nausea, vomiting, diarrhoea - when the mushroom is eaten uncooked, and some hypersensitivity symptoms, such as sneezing, runny nose, watery eyes and a generally uncomfortable feeling. This despite the fact that Boletus edulis has been found to contain trace amounts of amatoxins. From a toxicological point of view the concentration of amatoxins is so low that it causes no ill effects.
Homeopathy, on the other hand, places much more emphasis on individual susceptibility, and much less on amounts of toxins. Trace amounts may account for something, as we have seen with Amanita muscaria, which toxicologically contains too litde muscarine to produce effects and yet ingestion of the mushroom may induce muscarinic symptoms.
In addition, the king bolete contains selenium, as do a variety of other edible mushrooms.

Mutualistic [symbiotic]. Delicate pinkish network of fine lines on upper part of stalk. Alternately abundant and rare. Puzzling variableness. The King - "the one aristocrat the peasantry can eat. '' Little pig - the King reduced to vulgarity. Eases the tendons. Gastrointestinal upsets.

THERAPEUTICS

• Boletus edulis, when used in the "Tendon-easing pills" of traditional Chinese medicine, has a positive effect on lumbago, leg pain, numbness in limbs, bone and tendon discomfort, tetany, and leucorrhoea. [Hobbs]

• Dried, unopened king boletes cooked with pork are used in China to treat leucorrhoea.

• The fungus has been accredited with cancer preventive properties and anti-tumour activity. [Hobbs]

• Extracts of the fungus have shown to be effective, in vitro and in vivo, against influenza viruses.

• Pliny wrote that *suilli* [boletes] "are good as a remedy in fluxes from the bowels which are called *rheumatismi,* and for fleshy excrescences of the anus, which they diminish and in time remove; they remove freckles and blemishes on women's faces; a healing lotion is also made of them, as of lead for sore eyes; soaked in water they are applied as a salve to foul ulcers and eruptions of the head and to bites inflicted by dogs."

BOLETUS LURIDUS **Bol-lu.**

Scientific name Boletus luridus Schaeff: Fr. 1821.
Common name Lurid Bolete.
Family Boletaceae.

KEYS

- Mutualistic [symbiotic],
- Fire Fungus. Conspicuous blood-red network on stalk.
- Turns blue-black when cut or bruised.
- Alcohol <.
- Intense thirst.
- Angioneurotic oedema.

FEATURES

- Cap dull yellow-brown; velvety texture.
- Pores red to orange.
- Stalk covered with a conspicuous blood-red network.
- Spores olive-brown to greenish-grey.
- Flesh and pore surface when cut or bruised rapidly turn blue-black before fading to pale blue.
- Solitary or in groups. Summer to fall.
- Mycorrhizal symbionts: usually beech, lime or oak on chalky or neutral soil.
- Edible but mildly toxic when eaten raw or in combination with alcohol.
- Called 'fire fungus' in Scandinavia and Germany.
- Contains muscarine and coprine in low concentrations.

Mutualistic [symbiotic].
Fire Fungus.
Conspicuous blood-red network on stalk.
Turns blue-black when cut or bruised.
Alcohol <.
Intense thirst.
Angioneurotic oedema.

MATERIA MEDICA

» Based on poisoning cases [effects of eating the roasted fungi]. [Allen]

Symptoms

~ Delirium followed by death [4th day].
« Headache.
=» Sunken features [2nd day].

“Violet colour of the nose and lips [3rd day] [coptine!].
= Intense thirst.
= Violent pain in epigastrium [after two hours].
= Meteorismus [3rd day].
= Exceedingly fetid stool [3rd day].
“ Pulse small, irregular [2nd day].
= Subsultus tendinum [4th day].
« Urticaria tuberosa [= angioneurotic oedema] [speedily followed by death], [3rd day].
= Cold sweat [2nd day].

BOLETUS SATANAS **Bol-s.**

Scientific name Boletus satanas Lenz 1831.
Common name Satan's Bolete.
Family Boletaceae.

KEYS

- Mutualistic [symbiotic].
- Fine red network on stalk.
- Turns blue when cut or bruised.
- Decomposes soon after reaching maturity into a putrescent mass.
- Offensive odour, carrion-like or like rotting onions.
- Severe gastrointestinal irritation.
- Great prostration [from loss of fluids].

FEATURES

- Cap chalky-white to silvery brown.
- Stem with a fine red network; bulbous at base.
- Pores deep red.
- Flesh and pore surface turn blue when cut or bruised.
- Spores brown to olive-brown.
- Odour mildly spicy when young, unpleasant "like rotting onions" or carrion-like with age.
- "Slightly sour nutty taste."
- Solitary or in groups. Summer to fall.
- Does not live long after reaching maturity, but decomposes into a putrescent mass.
- Mycorrhizal symbionts: mainly oak, but also hornbeam or lime on calcareous soil.

CLINICAL MANIFESTATIONS

- Contains muscarine in low concentration.

- As bolete of Satan it conveys suspicion, but its name is worse than its effects. "Its reputation rivals that of the original possessor of its name. But an old proverb sayeth that even 'The Devil is not as black as he is painted'." [Mcllvaine]

It causes severe gastrointestinal irritation when eaten raw - vomiting, diarrhoea, severe cramps -, while thorough cooking appears to render the toxins harmless for some people eat this bolete regularly.

• In addition to the gastrointestinal upset some muscarinic effects may occur such as salivation, sweating, weakness, and disturbance of vision.

MATERIA MEDICA

« Based on two intentional and six accidental poisoning cases.
One of the experimenters, H.O. Lenz, tasted a piece of the fresh fungus, but spit it out soon.

> When *Boletus satanas* was described over a century ago, it had caused sickness and diarrhoea in several who had eaten it, or merely tasted it, and H.O. Lenz epitomised its attributes by the epithet *satanas,* for it proved so devilishly poisonous that even its emanations caused him to be ill when he was describing it. Its evil reputation has diminished with the years, and it is commonly eaten in Czechoslovakia and parts of Italy, though there is general agreement that it should always be cooked.
> [Ramsbottom 1953]

Symptoms

Mind
« Fear and restlessness. Intellect undisturbed.

Sensory
■ Sparks before the eyes, alternating with obscuration of vision.
«■ Noises in the ears.

Energy
·> Loss of all strength.
«· Sudden great weakness; so weak that he could scarcely stand or walk.
<= Excessive weakness, amounting to faintness, whilst the vomiting continued; repeated 10 or 12 times in an hour.

Temperature
~ Limbs cold.
= Cold sweat over the whole body.

Gastrointestinal
= Sudden nausea.
«■ Retching and vomiting.
«= Very suddenly appearing desire to vomit; very little nausea between the attacks, and no pain when vomiting the last time; after about 3 hours he noticed a slight trace of blood.
= Repeated vomiting; vomited everything he took.
» Continued to vomit [after the contents of the stomach] a bitter fluid, which was finally mixed with blood.
<·» Distension of epigastric region.
== Perceptible pulsation in epigastric region.
<■ Frightful pain in stomach.
= Abdomen sunken and frightfully painful.
« Obstinate tension of the abdomen.
= Profuse diarrhoea of blood and of the mucous membranes of the intestines.
= Watery evacuations.

Mutualistic [symbiotic]. Fine red network on stalk. Turns blue when cut or bruised. Decomposes soon after reaching maturity into a putrescent mass. Offensive odour, carrion-like or like rotting onions. Severe gastrointestinal irritation. Great prostration [from loss of fluids].

Mouth and throat
» Troublesome dryness in mouth and throat.
<·> Violent burning and scraping in throat.

Chest
= Oppression of the chest.

Limbs
= Sudden sensation through all the limbs as if he would be attacked with apoplexy. [Inaccurate translation; should be: "sudden sensation through all the limbs as if struck by lightning." The symptoms in Alien's Encyclopaedia are derived from the French translation of the originally German report by Lenz.]
= Violent, extremely painful cramps in the muscles of the limbs and the face.

LENZ

The Satan's Bolete owes its name and a good deal of its reputation to the German botanist H.O. Lenz, who, on 12 September 1830, accompanied by his friend, the medical student Karl Salzmann, went out on a mushroom foray in the pouring rain. The next morning, at 10 a.m., Lenz chewed on a piece of a fresh Satan's Bolete to spit it out soon.

"At 11.30 a.m., while shaving," writes Lenz, "a sudden sensation went through all my limbs as if I were struck by lightning. Startled, I stopped shaving, but within three minutes I recovered so much that I, though still a bit shaky, could finish the shaving. I believed the sensation to be the result of getting too cold during yesterday's mushroom hunt and didn't think of it anymore. It didn't cross my mind that the mushroom had anything to do with it since I had been chewing more than once on pieces of fly agarics without experiencing any bad effects.

At half past four in the afternoon I started the description of the Satan's bolete and tasted again a piece of it. It had a good taste and smell. At 7 in the evening I suddenly felt a great weakness and had to vomit ... With the last time that I vomited, around 10 p.m., the bitterness of the vomit was mixed with a slight taste of the mushroom and with blood. Thereafter the vomiting stopped: until 2 a.m.

I felt cheerful, which was followed by such weakness that I could scarcely stand or walk. I didn't have any pain and the poison hardly affected my bowels. I drank much olive and linseed oil, but felt the next day still rather weak, to feel well again on the third day."

Friend Salzmann was less fortunate. He ate at 8 p.m. one fresh specimen after removing its skin and tubes and frying it with butter, bacon, onions, flour and a little water. [Contrary to Allen's statement that he "ate some cooked in salt and water, and roasted."] Afterwards he took a large portion of potatoes with butter. According to Lenz he neglected to put the fungus first in salt water or vinegar, which at the time was believed to neutralise all potential toxins in mushrooms.

Around 10 p.m. Salzmann suddenly feels sick and starts vomiting, which he continues to do some 30 times during the night. As with Lenz, the sickness consists mainly of vomiting and nausea, pain being more or less absent. In spite of [or due to?] drinking olive oil and milk alternately, the vomiting continues and soon, due to loss of fluids, exhaustion sets in.

The pulse is weak, the limbs cold, the abdomen sunken and frightfully

painful. The muscles of the limbs and even of the face are contracted by painful cramps. Three physicians, of increasing rank, render emergency assistance, but the patient keeps on vomiting the oil, milk, oatmeal slime and almond oil given to him. In the morning, after an "anxious, dreadful night," Salzmann starts taking every hour a spoonful of an emulsion of almond oil, gum arabic and opium, after which the desire to vomit decreases and eventually ceases. The weakness remains for almost a week; full recovery occurs after two or three weeks.[1]

1 from: Volkbert Kell, Giftpilze und Pilzgifte, p. 114-116.

BOLETE BOLDNESS

Certain substances bring about insanity, in various degrees, temporarily or long-lasting. The range of states of madness, such as Mad Hatters [mercury poisoning], Manganese Madness, and Nightshade Raving, was in 1959 extended with a newly discovered phenomenon termed "mushroom madness." The term was introduced by the Australian anthropologist Marie Reay to describe the peculiar behaviour of the Kumba and Kaimbi, two tribes living in the Wahgi Valley of the Western New Guinea highlands. According to earlier reports, the use of a wild mushroom, locally called *nonda,* "excited tribesmen to a combative frenzy" and made "the user temporarily insane and fly into a fit of frenzy."

In the early 1960s the renowned French mycologist Roger Heim set out to study the mushroom madness and identified the fungi responsible for it as "at least six boletes and one russula." The boletes, particularly *Boletus manicus,* were described by Heim as being similar in appearance to *Boletus satanas* in having red pore mouths. [Red-pored boletes have a dubious reputation and are all generally considered to be mildly toxic.]

Heim, as well as others after him, failed to identify any type of compound that might cause the physiologic or hallucinogenic activity exhibited by the Kuma. Trace amounts of three indole derivatives were detected in Boletus manicus by Albert Hofmann, but the amounts "were insufficient to make any definite deductions." Instead, Heim stated that the madness "must be viewed as part of a larger event in the life of the native community," for which the ingestion of mushrooms serves as an excuse for their unusual behaviour.

He then expressed his doubts about the set and settings - individual psychological makeup, circumstances, expectations, dose, etc. - that influence the effects of the mushrooms. “One would have to believe that these mushrooms worked only on certain individuals, chosen by heredity, one to a family [usually the oldest child]; that they brought about different behaviour in men and women; that most of the time they caused no disturbance but that at irregular intervals, in a progress up the Wahgi Valley, with a couple of days between the clans, they acquired a pharmacological potency with respect to those individuals and thereupon drove them mad, with consequences known to all; and finally that the visitation could be put off or even permanently exorcised by simply dunking the individual in cold water. This is not mycology but mythology.”[1]

It is, on the other hand, a pretty accurate description of what in homeopathy would be regarded as aetiological factors and individual constitution, concepts which play a minor role, if any, in toxicology and pharmacology. The question why specific fungi are selected to induce the behaviour remains unanswered.

A different picture arises if we place the mushroom madness in a cultural context. Marie Reay has characterised Kuma culture in general as “hedonistic, involved in a series of mundane activities oriented toward self-aggrandizement and display, control of women, and accumulation of pig wealth. Values such as pursuit of one’s reputation and triumph over others, antagonism between men and women, opposition between youth and age, and division of people into classes of kinsmen and strangers embrace the major foci of Kuma/ Kaimbi society.”[2]

Pigs play an important role in their culture and, interestingly, the natives use a phrase for the mad behaviour that draws an analogy with the actions of wild pigs. The fungi causing the “wild-pig behaviour” are all species of Boletus; hence “Bolete Boldness” would seem more appropriate than mushroom madness. The Russula was thought to affect only females of the tribe, perhaps because of a belief that links russulas to fertility. Is it coincidence that the Romans associated boletes with pigs as well?

Instrumental to the process, the boletes can be seen as the catalysts that set off a chain reaction of psychological and physiological changes. Marlene Dobkin de Rios has summarized what is known of Kuma mushroom madness.

> When women partake, they become delirious and irresponsible, begin to dance and sing, and have their husbands or sons decorate them in their

best feathers. They are even given weapons to hold. At this time, married women are permitted to dance in formation in the way that men and unmarried girls do. When the women return to their houses, they boast of real or imaginary sexual adventures.

When a woman feels that an attack is forthcoming, she will plunge into a nearby river if she does not want to exhibit herself. Although mushrooms are eaten in all seasons of the year by young and old, men and women, and are mixed with other vegetables, the Kuma attribute this madness to the mushrooms, although it occurs only in the dry season. No ritual preparation accompanies the madness [Reay I960].

Men under the effects of the plant behave differently. They put on all kinds of ornaments, take up their weapons, and run about terrorizing everyone in sight. Attacking their clansmen and families, they often stray to other communities to frighten distant relatives. They are described as tense and excited - they shiver in the extremities of their fingers, they report seeing double, and they seem to suffer from aphasia.

Although minor injuries have been reported, the mushroom madness rarely, if ever, leads to serious wounds and never to death. Heim found this fact noteworthy, since elsewhere maniacs do find their mark on occasion. In fact, relatives are attacked only when spectators are present, at which time the attacker can be held back if necessary. Interestingly enough, when several men are afflicted with the madness, they tend not to pay attention to one another, but only to those unaffected [Reay 1959].

Heim and Wasson [1965] describe the social excitement connected with teasing individuals in this state. Women and boys, in search of an exciting diversion, deliberately encourage men to be aggressive. For those men who are the chief protagonists in this social drama, it is a departure from normal activity, which they are able to joke about at a later date. People who are affected by the mushroom are not stigmatized in any way, nor do they achieve any kind of prestige as the result of this temporary aberration. Rather, the Kuma believe that the people involved are not responsible for their activities.

... There is general agreement in the Wahgi Valley that the feats of endurance performed by wild men by far exceed their normal physical activity. Rushing up and down mountain trails, these individuals shake their weapons about and shout as loud as they can.

... Reay [1960] summarizes running amok as a kind of instutionalized deviance that permits individuals at certain times of stress to channel anti-social sentiments into a limited range of activities. Although open aggression

> toward kinsmen is strongly disapproved, running amok behaviour permits such social expression without penalty or stigma. Reay further has argued that the mushroom madness among the Kuma seems to be an institutionalized form of tendencies that are normally forbidden expression: women may have a real nostalgia for their years of courtship and the men for real aggression against members of their own group. The madness, then, is a periodic expression of behaviour that is considered antisocial during normal times.
> ... Although running-amok behaviour may have some cathartic value, and may be what anthropologists like to consider a "ritual of rebellion," we cannot, of course, eliminate the possibility that there is some chemical effect of the mushroom that is responsible for the madness.
> [Dobkin de Rios 1990]

The physical symptoms accompanying bolete boldness include increased respiratory and circulatory rate, decreased skin temperature, sweating, rapid heart beat, trembling and shaking, dizziness, erratic motor control, glazed or turned-up eyes, diplopia, shivering, impaired hearing, and intermittent aphasia. [These symptoms are by some viewed as the result of the ingestion of green tobacco leaves by the natives.]

1 Schultes & Hofmann 1980, pp. 317-320.

2 Dobkin de Rios 1990, pp. 81-89.

IV. ORDER CANTHARELLALES

IV A. FAMILY CANTHARELLACEAE

Cantharellus cibarius

CANTHARELLUS CIBARIUS **Cantha-c.**

Scientific name	Cantharellus cibarius Fr.: Fr. 1821.
Common name	Cantharelle.
Family	Cantharellaceae.

KEYS

- Mutualistic [symbiotic].
- Turns brown when pressed.
- It never did any one harm, but might even restore the dead."
- High water content. Sponge-like.
- Queen seductress.
- Night blindness.
- Frost, freezing <.
- Air pollution <.

FEATURES

- Cap funnel to trumpet-shaped [name derived from Gr. *kantharos,* vase].
- Cap yolk-yellow to orange-apricot; smooth and fleshy.
- Margin inrolled, later wavy and irregular.
- Considered a slow-growing species; needs a long period to establish itself.
- Fruiting bodies are long-lived, which is partly due to an ability to recover from injury [by growing new tissue].
- Spore-bearing surface irregular, wrinkled, with shallow, decurrent gills, paler than cap.
- Stem bright red at base.
- Stem turns brown when pressed.

• "Pleasant spicy," pumpkin or apricot-like odour when fresh. Descriptions of taste vary from slightly stinging to strong pepper-like taste.
• Spores pale cream.
• In groups on ground in mixed woods in autumn. Frost ends its fruiting season.
• Mycorrhizal symbionts: conifers [fir, spruce], oak, beech, and hornbeam.
• Found in older forests [30-400 years old], probably because the simple carbohydrates required for mycelial growth are easier obtained from the roots of older trees.
• Nitrogen-sensitive: high nitrogen soil levels, e.g. by fertilizers, reduce fruit body production in C. cibarius.

SPECIAL FEATURES

• High water content. Fruit body soaks up water like a sponge. Its mycelium, however, quickly suffers from water stress; hence this species is not found in biotopes with poor water drainage, e.g. pits or bogs.

• One of the most popular edible wild mushrooms. [Specific name derives from L. *cibar-,* food.]

> It is almost universally eaten in all countries where it is found, England excepted, where it is only to be met with at the "Freemasons Tavern" on state occasions, and at the tables of pertinacious mycophagists. Trattinnick says: "Not only this same fungus never did any one harm, but might even restore the dead."
> [Cooke 1895]

• Very difficult to cultivate due to a combination of factors: highly specific nutrient demands, inability to use complex carbohydrates such as cellulose [in contrast to species such as Agaricus bisporus], slow growth, and natural contamination of fruit bodies with moulds and bacteria [predominandy Pseudomonas fluorescens].

• Mcllvaine first made its acquaintance in 1881.

> The golden patches of single and clustered cibarius, fragrant as ripened apricots, tufting the short grass or mossy ground under beeches, oaks and

like-growing trees, through which the sunlight filtered generously, were so tempting, that he determined there must be luxury, even in death, from such toadstools.

• Where boletes are the "round mother-earth mushrooms of the forest floor," their flavour rich, nutty, buttery, and "the flavour of the forest," chanterelles are "more like the queen seductress: fruity, peppery, richer, more difficult to work with from a cooking standpoint, and complex and very singular." [Czarnecki, cited by Arora]

• In the Polish epic poem *Pan Tadeusz* a group of boys and girls collecting fungi is described. The boys "preferred the 'vixens' [Lithuanian for Cantharelle], emblems of maidenhood, uneaten by worms, no insect ever lights upon their forms." [Michiewicz, cited by Findlay]

Mutualistic [symbiotic]. Turns brown when pressed. "It never did any one harm, but might even restore the dead." High water content. Sponge-like. Queen seductress. Night blindness. Frost, freezing <. Air pollution <.

• Low in protein. High in vitamin A, which makes frequent consumption of this fungus beneficial in preventing night blindness, eye inflammations, and dry skin, according to traditional Chinese medicine.

• Consumption of cantharelles which have been exposed to night frost or which have been defrosted has resulted in nausea, vomiting, cramps, and pains in the limbs. [Lewin]

• Various gastrointestinal symptoms due to eating cantharelles cooked for food have also been reported, as well as occasional cases where numbness, pain or oedema was experienced.

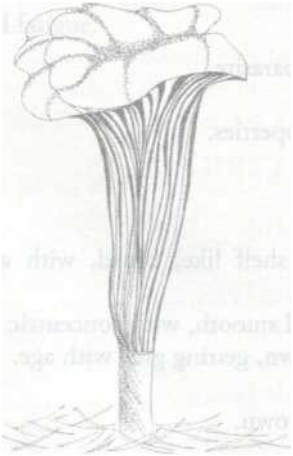
• Fine root biomass and fructification of mycorrhizal fungi were studied in Norway spruce forests around the Russian industrial city St. Petersburg affected by a varied spectrum of air pollution. The total biomass of fine roots of spruce from the cleanest zone and from the zone, which is heavily stressed by emission, differs considerably in their values. Boletus edulis and Cantharellus cibarius were found only in the cleanest zones and these two mycorrhizal fungi species may be reliable indicators of undamaged areas.

CANTHAXANTHIN

• Canthaxanthin is a carotenoid pigment. It has been isolated from Cantharellus cinnabarinus, a chanterelle with a bright pinkish-red to orange-

red colour that sometimes grows with C. cibarius. The pigment occurs also in the plumage and organs of tropical birds [flamingo, scarlet ibis, roseate spoonbill], and in various crustaceans and fish [trout, salmon]. It is used as a direct food additive, as an additive to animal feed to enhance the colour of chicken skin and to give an artificial pink tint to the flesh of trout and salmon reared on fish farms, and as an orally-administered pigmenting agent for human skin in both pharmaceutical and cosmetic applications [oral suntanning preparations]. Due to crystalline deposition in the retina, oral intake may cause deterioration of twilight-vision, sensitivity to glare, blurred vision and delay in dark adaptation time. Patients with a history of urticaria may suffer a recurrence of their symptoms after an oral challenge with 410 mg canthaxanthin taken as three divided doses over three hours.[1] Excessive amounts of canthaxanthin "can turn the palms of the hands and the bottoms of the feet a red/bronze colour, indicating that the dosage should be cut down in a gradient fashion." In an article in the August 1993 issue of American Pharmacy adverse effects of the use of canthaxanthin "tanning" pills are reported, consisting of "nausea, cramping, diarrhoea, severe itching, and welts."

1 WHO Food Additives Series 26, 35 and 44.



Cantharellus cibarius

V. ORDER HYMENOCHAETALES

V A. FAMILY HYMENOCHAETACEAE

Phellinus nigricans

PHELLINUS NIGRICANS

Phell•n

Scientific name Phellinus nigricans (Fr.) P. Karsten 1899.
Synonyms Polyporus nigricans Fr. 1821.
Fomes nigricans (Fr.) Gillet 1878.
Phellinus igniarius var. nigricans (Fr.) Bourdot & Galzin 1928.
Ochroporus nigricans (Fr.) Fiasson & Niemela 1984.
Common name Black Conk.
Family Hymenochaetaceae.

KEYS

- Black.
- Saprophytic or wound parasite.
- Destructive tendencies.
- Immunostimulating properties.

FEATURES

- Fruiting body woody, shelf like, broad, with a relatively sharp edge. Perennial. Upper surface black and smooth, with concentric zones.
- Under surface dark brown, getting grey with age.
- Pores in layers.
- Spores brown to grey brown.
- Causes wood rot.
- Solitary or in small groups on living and dead standing trees, mostly birch [in northern regions],
- Saprophyte/ Wound parasite.

SPECIAL FEATURES

• Once considered as part of the Phellinus igniarius [False Tinder Polypore] complex, but now recognized as a distinct species. [Phellinus igniarius (L.: Fr.) Quelet (1886).]

• Decay fungus with “quite destructive” tendencies, “causing an intensive white heart rot that reduces its host to a soft, whitened mass.” [Arora]

• Australian Aboriginals have used Phellinus fruiting bodies medicinally. The smoke from burning fruit bodies was inhaled to relieve sore throats, while scrapings from slightly charred fruiting bodies were drunk with water to treat cough, sore throats, bronchial problems, fevers and diarrhoea.

Black.
Saprophytic or wound parasite.
Destructive tendencies.
Immunostimulating properties.

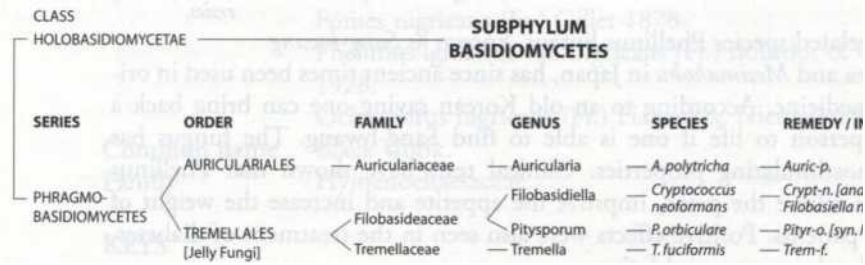
• The related species Phellinus linteus, known as *Sang-hwang* in Korea and *Mesimakobu* in Japan, has since ancient times been used in oriental medicine. According to an old Korean saying one can bring back a dying person to life if one is able to find Sang-hwang. The fungus has immunostimulating properties. Clinical tests have shown that Phellinus extracts relieve the pains, improve the appetite and increase the weight of cancer patients. Positive effects were also seen in the treatment of diabetes, high blood pressure, and fatigue.

CLASS PHRAGMOBASIDIOMYCETES

I. ORDER AURICULARIALES

I A. FAMILY AURICULARIACEAE

Auricularia polytricha



AURICULARIA POLYTRICHA **Auric-p.**

Scientific name	Auricularia polytricha (Mont.) Sacc. 1885.
Synonyms	Exidia polytricha Mont. 1834. Hirneola polytricha Mont.
Common names	Wood Ear. Cloud Ear. Ear Fungus. Black Chinese [Tree] Fungus.
Family	Auriculariaceae.

KEYS

- Ear-shaped saprophytic fungus growing on wood.
- Turns purple with age.

- Hard or soft and flabby.
- Inflexible when dry, flexible when moist.
- Strengthens the will. Contains iron.
- Haemorrhages. Circulation.

FEATURES

- Superior surface mouse-grey to olive-brown when fresh; inferior surface greyish brown.
- Turns purplish with age.
- Rubbery texture; similar to A. auricula, but more hairy, to which the specific name refers *[polytricha* = 'many hairs']. Its Japanese name "Arage-Kikurage" means "hairy forest jellyfish."
- Called "Cloud Ear" because dried specimens billow up like clouds when soaked in water.
- Grows with its fertile surface [hymenium] facing downward.
- Widely distributed on both hardwoods and conifers [branches and dead wood].
- More common in tropical and subtropical regions than A. auricula, the latter occurring more frequently in temperate regions.
- Requires a damp atmosphere, with sufficient heat in summer and a long period of rain.
- Very common in New Zealand, where it can be found at all times of the year. The fungus was of considerable economic importance around 1900 when large quantities of the dried fructifications were exported to China for food.
- Cultivated in the Far East on decaying oak-logs.
- Often served in soups or pork dishes ["to add a pleasant chewiness"] in Chinese restaurants under the name Muk Nge.
- Saprophytic; grows throughout the wood and bark with a microscopic hairlike mycelium.

Ear-shaped saprophytic fungus growing on wood. Turns purple with age. Hard or soft and flabby. Inflexible when dry, flexible when moist. Strengthens the will. Contains iron. Haemorrhages. Circulation.

CLINICAL FEATURES

• The Chinese consider the action of the Cloud Ear upon the system to be very beneficial, giving lightness and strength to the body and strengthening the will. The fungus aids in the cure of haemorrhoids and prevents haemorrhages. In some regions of the country it is used to treat blood clotting

difficulties and postpartum thrombophlebitis. Traditional uses include the treatment of weakness after childbirth, cramps and numbness, menorrhagia and leucorrhoea, and gastric disorders accompanied by nausea and excessive mucus.

• In the early 1980s the fungus was found to cause a condition dubbed the Szechwan restaurant syndrome or Szechwan purpura, which consists of small, blotchy haemorrhages in the skin. It was demonstrated that the fungus contains compounds inhibiting platelet aggregation, resulting in aspirin-like effects such as epistaxis, heavy menstrual bleedings, and small wounds bleeding profusely. The extensive use of tree ears in the Chinese cuisine may help to explain the low rate of heart disease among the Chinese.

• Reports on adverse effects are rare. Hobbs mentions the case of a man who suffered from solar dermatitis after consuming 250 g of the fresh fruiting body of A. auricula. Upon exposure to sunlight he developed flushing on the exposed parts of the body, with significant swelling, blisters, and exudation.

• There are reports on its effectiveness in reducing the blood glucose levels in experimental mice that are genetically obese and have diabetic syndromes such as hyperglycaemia, hyperinsulinaemia, glucosuria and severe insulin resistance.

• The protein, vitamin, and carbohydrate content of Auricularia are reported to be higher than that of many vegetables and fruits and the caloric content is relatively low. Cloud Ears are rich in iron.

JEW'S EAR

• Auricularia polytricha is used interchangeably with the species *Auricularia auricula* or *Hirneola auricula-judae,* Jew's Ear, also known as *A. sambucina* because it patronizes elders [Sambucus]. The fungus is associated with Judas Iscariot, who was said to have hanged himself on an elder after betraying Jesus, in consequence of which this tree frequently bears an appendage strongly resembling a human ear, known as "Judas' Ear," corrupted to "Jew's Ear." As a sort of curse the "ear" is believed to be his returned spirit.
Because of its fancied resemblance with the fauces of the throat it had at some time a reputation as a cure for sore throats. "Thus by a kind of poetic

justice, the elder, by means of which Judas died from a throat trouble, later provided a means of remedying indispositions of the same in others. It is incidentally not quite clear why Judas' Ear, and not his tongue, should commemorate his evil deed, for the latter would have seemed more appropriate." [Rolfe & Rolfe]

Auricularia auricula is a soft, flabby, reddish-brown, stalldess, expanded saucer-like fungus, the outside being velvety, the inner surface smooth and wrinkled. It dries blackish and bone-hard, but swells up and becomes flexible when moist, resuming its original texture and colour. It is edible and considered a delicacy in the Far East, where its ally, A. polytricha, is largely cultivated. Both species are medicinally in China and have been shown to reduce cholesterol build-up in the blood.

IL ORDER TREMELLALES

II A. FAMILY FILOBASIDIACEAE

Cryptococcus neoformans
Pityrosporum orbiculare

CRYPTOCOCCUS NEOFORMANS **Crypt-n.**

Scientific name Cryptococcus neoformans (San Felice) Vuillemin 1901.
Synonyms Saccharomyces neoformans San Felice 1895.
Cryptococcus hominis Vuill. ex Gueg.
Torula histolytica J.L. Stoddart & Cutler 1916.
Teleomorph Filobasidiella neoformans Kwon-Chung 1975.
Family Filobasidiaceae.

NOTE: This fungus has the name "Cryptococcinum" - abbreviation: *Cryptc.* - in the repertory, suggesting a similarity with bacterium-derived remedies such as Meningococcinum, Staphylococcinum, and Streptococcinum. Use of the proper Latin name will avoid confusion.

KEYS

- Yeast, but does not ferment sugars.
- Heavily encapsulated.
- Turns brown with age due to melanin production.
- Pigeons. Pigeon breeders.
- Predilection for CNS and brain. Meningitis.
- Inappropriate speech or dress.
- Defining disease for AIDS.

CLASSIFICATION

- The classification of Cryptococcus is controversial. The genus is by some mycologists placed in the order Aphyllophorales [polyporous fungi], by

others in the order Tremellales. The following seems convincing evidence for the latter.

> June Kwon-Chung, a scientist at the National Institutes of Health, made an important discovery about *Cryptococcus* in 1976. She isolated fifteen cultures of the fungus from tissues of infected patients and crossed pairs of the strains on agar plates by streaking their yeast cells together. Cells of four of the pairs became attached and fused. Fusion is cryptococcal sex, an interesting observation itself, but the next event was quite astonishing. From the glistening white colonies of merging cells, a different type of fungus emerged.
>
> Although it didn't resemble a mushroom, it grew as cylindrical hyphae rather than oval yeasts and formed basidia and bacterium-sized basidiospores. It was recognized as a relative of certain wood-decaying fungi with gelatinous fruiting bodies ['jelly fungi'], and was named *Filobasidiella neoformans.* When the basidiospores germinated, they produced the much larger yeast cells recognized as *Cryptococcus.*
>
> Kwon-Chung's discovery showed that the yeasts which proliferated in the brain represented one growth phase of a fungus whose genes also encoded the instructions to make a spore-producing hyphal basidiomycete. *Cryptococcus* and *Filobasidiella* are different manifestations of the same species and a single genome. This type of relationship, called the anamorph-teleomorph connection, is widespread among fungi. The yeast that grows in human tissues is the asexual part of the life cycle, termed the anamorph.
>
> [Money 2002]

FEATURES

- Belongs to a genus of around 20 species of *yeasts.*
- Fast growing as creamy, white to slightly pink or yellowish brown, mucoid colonies.
- Turns brown with age due to melanin production.
- Thrives at a temperature range of 25 to 37° C; growth slows down at 39- 40° C.
- Worldwide distribution.
- Sources: soil contaminated with pigeon or chicken droppings [C. neoformans var. neoformans] or eucalyptus trees and decaying wood forming hollows in living trees [C. neoformans var. gattii].

- Birds are the major vectors, in particular the pigeon *Columbia livia.* The birds themselves do not get infected because of their high body temperature, which inhibits fungal tissue invasion.
- Accumulates in abandoned areas contaminated with pigeon droppings. The yeast remains viable for 2 years or longer in the excreta.
- The discovery of Cryptococcus in pigeon droppings resulted in the 1960s in a declaration of war on pigeons.
- Has also been isolated from dairy products, fruits, vegetables, plants, and from faeces of healthy people.
- Does not ferment sugars, contrary to Candida.
- Environmental form is desiccated and very durable; pathogenic form, whether in tissue or cerebrospinal fluid, is heavily encapsulated.

CRYPTOCOCCOSIS

- Has the respiratory system as the portal of entry. Initial exposure may be many years prior to the manifestation of disease. Infection may be sub acute or chronic.
- Cryptococcus yeasts are usually inhaled and produce a mild, often sub clinical primary pulmonary infection. In fact, 20% of pigeon breeders with no history of infection carry cryptococcal antibody, and patients with chronic lung diseases, i.e. bronchitis and bronchiectasis, can be asymptomatic carriers.
- Healthy persons with a history of exposure to pigeons or bird droppings and laboratory workers exposed to an aerosol of the organism have a higher rate of positive delayed skin reaction to cryptococcal antigen or cryptococci.
- Calcification and pulmonary fibrosis usually are absent.

- Primary focus in the lung [notably mid-to-lower-lung segments], but has a predilection for the central nervous system and the brain, resulting in the characteristic spread to the meninges and occasionally to the kidneys, bone, and skin. In a few reported generalized infections, the spleen, lymph nodes, bone marrow, liver, suprarenal, and thyroid have also been affected.
- Defining disease for AIDS; 6-10% of AIDS patients in Europe and North America get cryptococcosis [15-30% in Africa].

CNS CRYPTOCOCCOSIS

- Cryptococcosis is known under various alternative names: torulosis, torula meningitis, yeast meningitis, European blastomycosis, and Busse-Buschke

disease. The meningeal form has a prolonged evolution of several months, characterized by general irritability and mental changes, and is usually fatal. Initial symptoms include severe headaches, stiffness of the nape of neck, or a sore throat. These early symptoms become increasingly more intense and are associated with mental symptoms, personality changes, vomiting, dimness of vision or actual blindness, paresis or hemiplegic paralysis, and occasionally convulsions. The disease finally terminates in progressive stupor, coma, and respiratory failure. Cryptococcal meningitis may resemble other mycoses, [neuro] syphilis, tuberculosis, or meningeal metastases.

• Symptoms at onset may be non-specific and include headache [73-81%], fever [62-88%], malaise [38-76%], nausea and vomiting [8-42%], stiff neck [22-44%], visual disturbances [30%], altered mental status with somnolence [18-28%], photophobia [19%], and cranial neuropathies [6%].[1] The manifestations resemble those of *Toxoplasma* or HIV encephalopathy.

> Although the onset usually is insidious and the course chronic, the patient may complain of sudden development of vertigo, severe frontal, temporal or post-orbital headache and vomiting. The insidious onset often is associated with the development of granulomatous lesions of the meninges, while the sudden severe onset may indicate the presence of rapidly spreading cerebral lesions.
>
> The signs and symptoms are those of an extending intracranial lesion or cerebrospinal meningitis with low grade fever, nuchal rigidity and tenderness. The patient may be irritable or apathetic, abnormally talkative or comatose and anorexic with resultant weight loss. Patellar and Achilles reflexes may be diminished but some patients exhibit hyperreflexia.
>
> Severe papilledema may be present and require frequent spinal taps to prevent irreversible optic damage. Amblyopia, diplopia, strabismus, nystagmus, photophobia, neuroretinitis, retinal haemorrhage and optic nerve atrophy may occur. The duration of central nervous system cryptococcosis varies from a few months to 15 or 20 years. The usual course is fairly rapid and marked by progressive deterioration.
>
> [Emmons 1977]

1 Florian P. Thomas, HIV-1 Associated Opportunistic Infections: CNS Cryptococossis; website eMedicine.com.

CLINICAL MANIFESTATIONS

Distribution of cryptococcosis is worldwide. In the USA, more cases occur in men aged 40 to 60. Individuals with Hodgkins disease are particularly susceptible.

CNS lesions include diffuse meningitis, meningeal granulomas, infarcts, areas of softening, increase in neuroglia, or extensive tissue destruction. Cutaneous lesions appear as acneiform pustules or granulating ulcers. Subcutaneous and visceral lesions are deep nodules or tumour like masses filled with gelatinous material. Acute inflammation is minimal or absent. In meningitis, headache is the most common symptom. The patient seeks medical care because of blurred vision or is brought to the physician because of such mental disturbances as confusion, depression, agitation, or inappropriate speech or dress.

C. neoformans can be cultured from the urine in about 30% of patients with meningitis. Although renal infection is usually asymptomatic, pyelonephritis with renal papillary necrosis has been reported. In AIDS patients, a focus of persistent infection after primary treatment has been the prostate.

The growing use of immunosuppressive therapy and the AIDS epidemic have increased the incidence of CNS fungal infections. *Cryptococcus* is the most common offender, complicating AIDS, Hodgkin's disease, lymphosarcoma, and chronic high-dose steroid therapy. *Coccidioides, Mucor, Candida, Actinomyces, Histoplasma,* and *Aspergillus* are encountered less often.

[Merck Manual, 16th ed.]

SYMPTOMS

- Confusion. Disorientation. Irritability.
- Impaired cognitive functions. Memory loss.
- Inappropriate speech or dress.
- Loss of coordination. Awkwardness, clumsiness.
- Dizziness.
- Headache; with stiffness of nape of neck.
- Pain behind eyeballs.
- Blurred vision. Diplopia.
- Photophobia.

- Nystagmus.
- Nausea and vomiting.
- Abdominal fullness prematurely after meals.
- Pain and swelling abdomen.
- Chest pain. Tenderness of sternum.
- Mild but persistent cough; scanty sputum [mucoid].
- Fatigue. Weakness. Drowsiness.
- Low grade fever.
- Excessive perspiration at night.
- Glandular swellings.
- Prolonged bleeding; bruising easily.
- Petechiae.
- Weight loss.
- Loss of appetite.
- Paraesthesias.
- Nerve pains.
- Skin ulcers.
- Skin lesions resembling molluscum contagiosum.

Yeast, but does not fermen
sugars.
Heavily encapsulated.
Turns brown with age due
melanin production.
Pigeons. Pigeon breeders.
Predilection for CNS and
brain. Meningitis.
Inappropriate speech or
dress.
Defining disease for AIDS.

DIMORPHISM

• Lower fungi have the ability to change form, known as *dimorphism.* The manifestation of one or other form depends on the growth medium. Host affects fungus and fungus affects host. Where lies the line between invitation and invasion?

Dimorphism indicates the extreme degree of adaptability these organisms are capable of, whether this is in response to environmental factors or to the general state of an animal or human host. Basically, they just proceed with their normal activities, the decomposition of dead or decaying matter, carrying out their part of the cycle of life. Labelling them as “opportunistic” makes their appearance and subsequent proliferation a matter of unfortunate or inconvenient coincidence. “Speaking of decomposing flesh,” Nicholas Money wonders “whether there is any correspondence between the fungal species that evolved to rot animal carcasses and those that now infect patients whose defences are compromised. It would be interesting to study the natural process of human decay from a mycological perspective.” Instead of as the harbingers of death, it would be just as interesting to study the mycological process of human replenishment from a homeopathic perspective.

PITYROSPORUM ORBICULARE **Pityr-o.**

Scientific name Pityrosporum orbiculare M.A. Gordon 1951.
Synonyms Microsporum furfur C.P. Robin 1853.
Pityrosporum ovale (Bizz.) Castell. & Chaim. 1913.
Anamorph Malassezia furfur (C.P. Robin) Baill. 1889.
Family Filobasidiaceae.

KEYS

- Lipophilic [fat-loving] yeast.
- Part of normal human skin flora; highest numbers present on chest and back.
- Overgrowth results in pityriasis versicolor.
- Common around puberty.
- High temperatures, humidity, and heavy sweating c.
- Seborrhoea and dandruff.

FEATURES

- Lipophilic *yeast* inhabiting the human skin [stratum corneum] as part of the normal flora. Higher numbers of the fungus are present on the chest and back.
- Chronic colonization [overgrowth] of the stratum corneum by Pityrosporum results in pityriasis versicolor, alternatively known as tinea versicolor, tinea alba, tinea flava, and dermatomycosis furfuracea. The condition is aptly characterized as the result of "a shift in the relationship between man and a resident yeast flora."
- Scales from active lesions have a pale greenish fluorescence under Wood's ultra-violet lamp.
- Has been recovered in blood cultures from neonate and adult patients undergoing lipid replacement therapy.
- Reported as agent of invasive human diseases including pneumonia, catheter-associated sepsis and peritonitis.
- Other predisposing factors frequently associated with infection are poor nutrition, excessive sweating, pregnancy, and Addison's disease. [Fisher]
- Does not grow unless fatty acids are added to the medium.
- Optimum growth temperature: 35-37° C.

PITYRIASIS

- Common in young people around puberty; probably related to hormonal changes and high production of sebum.
- Characterized by well-demarcated lesions varying in colour from white [depigmented], pink, pale brown, to brown [hyperpigmented] and covered with thin branlike [furfuraceous] scales.
- Affected areas include the back and chest [mainly], abdomen, neck, and arms. The face is commonly affected in children, with mostly hypopig- mented spots on the forehead.
- Very slight flaking [Gr *pityron* = bran], sometimes only apparent when the lesion is scratched.
- Occurrence is favoured by high temperatures [tropical areas; summer months in temperate climates], humidity, and heavy sweating.
- Affected areas do not tan but remain lighter coloured ["white sun spots"].
- If the hair follicles on the back and chest become infected, highly itchy acne-like spots appear [pityrosporum folliculitis].

SEBORRHOEA AND DANDRUFF

- For some two thousand years the only recorded effect of fungal infection on man was the *cutaneous* as typified by ringworm and candidosis of the skin and mucous membranes. In the 19th century more superficial infections were identified, such as certain skin conditions caused by Pityrosporum ovale.

Pityrosporum orbiculare has recently been found to play a role in sebor- rhoeic dermatitis and dandruff. Discovered independently, P. orbiculare and P. ovale are now thought to be different morphological forms of the same organism.

> Approximately 75 years ago [in 1874] Malassez reported the occurrence of an organism, *Pityrosporum ovale,* in the squamae, follicles, and sebaceous glands of the scalp. Since then many papers have been published, interest in this organism being centred on its possible relationship to baldness. Some workers have maintained that this organism is the cause of dandruff and seborrhoeic dermatitis; others, that this is a harmless saprophyte. Unna, one of the foremost students of this problem, is among those who believe that *P. ovale,* which he called the 'bottle bacillus' because of the

shape of the cells, is the aetiologic agent in this scaly condition of the scalp; he designated the disease 'pityriasis capitis.'

Among the recent workers who regard this organism as pathogenic is Moore [1935]. Ota and Huang [1933], on the other hand, concluded that their yeast-like isolates from seborrhoeic dermatitis, belonging to Pityrosporum, were saprophytes. The most critical study of this whole problem is that of MacKee and his associates [1938]. They made direct examination of the scrapings of normal and diseased scalps and in one series found *P. ovale* in 86 of the 100 cases examined, prevalence being little different on the normal and on the diseased scalps.

From these scrapings they also cultured species of moulds belonging to Aspergillus, Rhizopus, Alternaria, Chaetomium, Torula, Dematium, and Mycoderma, and in addition several species of Staphylococcus. MacKee and his associates conclude: "The occurrence at times of the organism [/? *ovale*\ on all types of scalps and the fact that it may occasionally be found in as large numbers on the normal scalp as on one with severe dandruff leads one to consider the possibility that this yeast is a saprophyte, and grows well in the presence of scaling or in sebaceous material but is not responsible for the presence of these findings."

[Wolf & Wolf 1947]

Pityrosporum is lipophilic; it has an obligate growth requirement for fatty acids. It can be grown on agar medium in a Petri dish, but only if it is bathed with oil.

Current evidence suggests M. furfur, combined with multifactorial host factors is also the direct cause of seborrhoeic dermatitis, with dandruff being the mildest manifestation. Host factors include genetic predisposition, an emotional component [possible endocrine or neurologically mediated factors], changes in quantity and composition of sebum [increase in wax esters and a shift from triglycerides to shorter fatty acid chains], increase in alkalinity of skin [due to eccrine sweating] and external local factors such as occlusion. Patients with neurological diseases such as Parkinson's disease and those with AIDS are commonly affected.

Clinical manifestations are characterised by erythema and scaling in areas with a rich supply of sebaceous glands ie the scalp, face, eyebrows, ears and upper trunk. Lesions are red and covered with greasy scales and itching is common in the scalp.

[MycologyOnline at http://www.mycology.adelaide.edu.au/]

Nicholas Money compares dandruff with “fragile rafts held together by the cells of *Malassezia* [Pityrosporum].” Whatever makes the dandruff appear or aggravate, it is always accompanied by Malassezia. Anti-dandruff shampoos are therefore nothing else than topical fungicides. The active ingredients - zinc, sulphur, and/or selenium - interfere with fungal proliferation on the scalp. It goes without saying that inhibiting yeasts which “immerse themselves in sebaceous fat and gorge on dandruff flakes” in the “grease bath” provided by the scalp, as Money puts it, won’t change a thing in the constitution that breeds the yeasts, not to speak of the potential toxicity of the compounds employed. And what if the yeasts just move to another body site to thrive?

> Onset in adults is gradual, and the [seborrhoeic] dermatitis usually is apparent only as dry or greasy diffuse scaling of the scalp *[dandruff]* with variable itching. In severe disease, yellow-red, scaling papules appear along the hairline, behind the ears, in the external auditory canals, on the eyebrows, on the bridge of the nose, in the nasolabial folds, and over the sternum. Marginal blepharitis with dry yellow crusts and conjunctival irritation may be present. Seborrhoeic dermatitis does not cause hair loss.
> Neonates [< 1 month old] may develop seborrhoeic dermatitis, with a thick, yellow, crusted scalp lesion *[[‘cradle cap”],* fissuring and yellow scaling behind the ears, and red facial papules. The newborn may also have an associated stubborn diaper rash.
> [Merck Manual, 16th ed.]

Lipophilic [fat-loving] yeast.
Part of normal human skin flora; highest numbers present on chest and back.
Overgrowth results in pityriasis versicolor.
Common around puberty.
High temperatures, humidity, and heavy sweating <. Seborrhoea and dandruff.

ATOPIC ECZEMA/ DERMATITIS

• A study at three Swedish University Hospitals, in 2001, demonstrated that the cutaneous commensal P. orbiculare can act as an allergen in patients with atopic eczema. Of 132 adult atopic eczema patients, 88 patients [67%], but none of the 33 healthy controls, reacted with specific serum IgE, positive skin prick test and/or positive atopy patch test to the tested Malassezia [Pityrosporum] allergens. Another study found that patients with atopic eczema manifesting predominantly on head and neck most frequently showed Malassezia-specific IgE antibodies.

PSORINUM OR MELITAGRINUM?

• Gross used for the proving of Psorinum the "epidermoid efflorescence of pityriasis" instead of the contents of a scabies vesicle. As such the "psora sicca" of Gross comes closer to Melitagrinum, a nosode made from "the lymph and blood of a case of eczema capitis" than to Psorinum. Since "eczema capitis" and pityriasis capitis ['cradle cap'] are almost certainly identical the symptoms from Gross's proving might belong to Melitagrinum [Pityrosporum]. Listed as references nos. 2 to 5 in Allen's Encyclopaedia, Gross and his provers produce 106 symptoms, of which the following are worth mentioning:

- He is very irritable, although he conquers his ill humour; only disagreeable things affect him, agreeable impressions he passes by without noticing them [from smelling 28th potency].
- Vertigo and fiery sparks before the eyes.
- Great dullness of the head, so that he fears an inflammation of the brain; nosebleed relieves. [This is considered a keynote symptom of Psorinum!]
- Headache, pressing over the whole forehead, especially in the temples, increased by steady mental exertion, relieved by motion, esp. in the fresh air; it is worst morning and evening, with excessive sensation of heaviness in the forehead; frequently it suddenly passes off, and attacks instead the molars of the left side [from 10 drops of 30 th].
- Burning, pressing pains in the eyes, when looking sharply at something, and in the evening by candlelight [from 10 drops of 30th].
- The nose is not stuffed, but sometimes, esp. when stooping, a clear watery fluid pours from the nose, esp. from the left nostril.
- At night he gnashes his teeth so severely that it awakens him [after three doses of 30th],
- Scratching in the back part of the mouth; when sitting with the body leaning backward, feels asthmatic [12 hours after 30th].
- Bitter taste, passing off after eating and drinking [from the 30th].
- Haemorrhoidal troubles in stormy weather.
- Absence of erections, even with lascivious thoughts, for about two weeks, followed for four days by morning erections and pollutions, with satyriasis, and finally the usual state [from 10 drops of 30th].
- Cough, so that he could not remain in bed, for four nights, nor sleep for an hour; felt weak and dizzy.

- Pressing pains in the chest, always in small spots [from 10 drops of 30th].
- Feels contracted in the chest, and somewhat dry in the throat, immediately after taking the medicine.
- Sensation as if the left arm were asleep, and numbness in the three first fingers and of half of the hand, morning, for an hour [one hour and a half after 10 drops of 30th].
- Sensation in the right leg as if it would go to sleep [eight hours after 6 drops of 30th].
- Bruised pains in the legs, esp. in the tibiae and soles, as after too much exercise in walking, with a peculiar restlessness in the legs, so that he frequently changes position, passing off after rising, for several mornings while in bed [from 10 drops of 30th].
- Cramp or spasm in single toes, esp. in great toe of left foot, when stretching it out or taking off boots.
- Stormy weather affects him; he feels already a restlessness in his blood a few days beforehand.
- Eruptions, consisting of vesicles filled with lymph, painful to the touch, at various places on the body; some form papules and itch severely [after 10 drops of 30th].
- Itching over the whole body; when rubbed, small papules and vesicles arise.
- Voluptuous itching at the point where a flea bit; can hardly stand it; white hard blisters on a red base at such points.
- In the evening, after a glass of Muscat wine, itching of the soles, with tickling and heat [from 49 drops of 29th potency].

• Thus: when Psorinum doesn't work, in spite of apparently being indicated, try Melitagrinum!

• Case of Eczema Glandis of Six Years' Duration.
An unmarried rufous gentleman, 32 years of age, came under my observation on may 18, 1887, for left-sided varicocele and eczema of the glans and of the sulcus of the penis; the eruption had been there for six years. Patient was puce. He informed me that he had formerly had eczema on his head. I first gave him Clematis erecta lx, five drops in water twice a day, but with no benefit. In June and July, for about five weeks he was under Malandrinum 30, with very great amelioration; and thereafter, for about the same length of time, he had from me Melitagrinum 100.
This cured the eczema, and patient ceased attending. At the end of the year

patient said there was a very little of the eczema still in the sulcus, but he did not think it worth while being treated for it.
[Compton Burnett]

DD
Psorinum
Melitagrinum
Malandrinum
Pityrosporum orbiculare

If Psorinum does not work when indicated, try
Melitagrinum.

II B. FAMILY TREMELLACEAE

Tremella fuciformis

TREMELLA FUCIFORMIS **Trem-f.**

Scientific name Tremella fuciformis Berk. 1856.
Common names Silver Ear. Snow Fungus. White Jelly Fungus.
Family Tremellaceae.

KEYS

- Gelatinous, dimorphic fungus parasitizing on or associating with other fungi.
- Prefers damp areas; shrinks when dry, swells up when wet.
- Snow White or wolf in sheeps clothing.
- Bronchial and asthmatic problems.
- Hypoglycaemia.
- Radiation injury from radio- and chemotherapy.

FEATURES

- Fruiting body gelatinous [yet tough], pure white, translucent, with numerous wavy, leaf-like lobes.
- Has no cap or stalk.
- Dries up rapidly during dry weather, shrinking to almost nothing, but revives as rapidly when rehydrated.
- Prefers damp areas.
- Spicy odour.
- Parasitic on the mycelium of wood decay fungi. [Or symbiotic?]
- Tremella species are often difficult to culture, since many of them have a yeast phase in the absence of their wood decay host. This yeast is often mistaken for a contaminant and the culture is discarded. When successfully cultivated, the host fungus is inoculated into the log first, then this parasitic fungus. [Tom Volk]
- Hence T. fuciformis belongs to the dimorphic fungi: it lives as unicellular,

budding yeast cells until it meets compatible mating strains - the host - to then develop into a jelly fungus.

• Jelly fungi are generally found on dead or rotten wood. They typically have a gelatinous or rubbery texture. As their name signifies, they tremble like jelly when moist. The most familiar types look like lumps of melting butter and are collectively called 'witch's butter.' Like jelly they shrink down to almost nothing during dry weather, to swell up again as soon as it rains [Tremellales], or they are hard, tough, horny when dry and become gelatinous when wet [Auriculariales].

TRADITIONAL AND MEDICAL USE

• Cultivated in China, Silver Ears are considered a delicacy and served as a dessert in rock candy syrup. The fungus was listed as the food used in the imperial court in ancient times, and is recognized as a traditional tonic in China.

Gelatinous, dimorphic fungus parasitizing on or associating with other fungi.
Prefers damp areas; shrinks when dry, swells up when wet.
Snow White or wolf in sheep's clothing.
Bronchial and asthmatic problems.
Hypoglycaemia.
Radiation injury from radio- and chemotherapy.

Aside from having many other virtues, it "strengthens the body, nourishes the brain, improves the looks and skin as well as prolonging life." Yang Guifei [719-756], Imperial Concubine and allegedly the most beautiful woman in Chinese history, maintained her beauty, it is said, with this mushroom. Tremella fuciformis is commercially available in dried form and is advertised as a "Woman's Friend for Skin, Bone and Weight Control."

Its traditional use as a tonic, a freckle remover, and a cure for female disorders, elicited from one author the promise, "Eat them and enjoy a long and unblemished life."

Looks can be deceiving because jelly fungi, "long considered harmless saprophytes on decaying wood, have recently been unmasked as vicious mycoparasites of wood decay fungi," according to Kendrick. The exact nature of the association has not been fully clarified, however, and might be a "companionship," since Tremella fuciformis cannot degrade lignin and therefore requires the help of a companion fungus to pre-digest it.

In the structure of their basidia jelly fungi differ fundamentally from other Basidiomycetes, which makes them resemble more closely the rust and smut fungi, e.g. Ustilago.

• At any rate, whether Snow White or a wolf in sheep's clothing, Tremella is capable of synthesizing polysaccharides, which exhibit immunostimulating properties, hypoglycaemic activity and inhibit tumour development.
Hobbs has reviewed the studies on the bioactivities of the fungus.

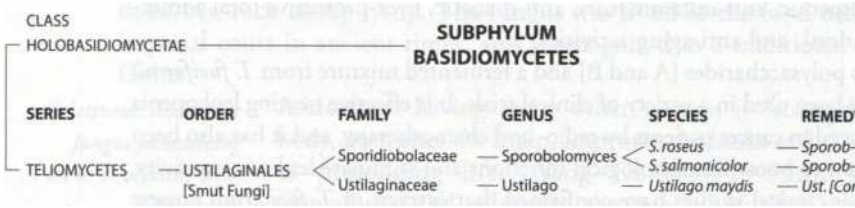
> It is recommended in China to be taken for weakness after childbirth, constipation, abnormal menstruation, haemoptysis, dysentery, and gastritis. ... A number of animal studies have shown that polysaccharides as well as a fermented solution and various extracts from *T fuciformis* enhance cellular and humoral immune function. ... In addition, the polysaccharides and glycoproteins protect against the negative effects of radiation. ...
>
> Five polysaccharide fractions isolated from *T fuciformis* have demonstrated antitumour activity against human cervical carcinoma cells *in vitro*. ... *T. fuciformis* polysaccharides and spore extracts have also demonstrated antilipemic, anti-inflammatory, anti-diabetic, liver-protective [oral administration] , and anti-aging activities. ...
>
> Two polysaccharides [A and B] and a fermented mixture from *T. fuciformis* have been used in a variety of clinical trials. It is effective treating leukopenia induced in cancer patients by radio- and chemotherapy, and it has also been shown to boost immunological functions and stimulate leukocyte activity. Other clinical studies have confirmed that extracts of *T. fuciformis* possess antitumour and anti-radiation properties and strengthen immune activity. In addition, both Tremella spore fermented solution and polysaccharides A and B have increased phagocytosis of macrophages, resulting in improved immunity and resistance to chronic bronchitis in human patients. ...
>
> In TCM it is used as a cough syrup for treating chronic tracheitis and a number of other cough-related conditions, such as asthma, dry coughs, heat in the lungs, etc.
>
> [Hobbs 1995]

CLASS TELIOMYCETES

I. ORDER USTILAGINALES [Smut Fungi]

I A. FAMILY SPOROBOLOMYCETACEAE

Sporobolomyces roseus
Sporobolomyces salmonicolor



FEATURES OF THE GENUS SPOROBOLOMYCES

- Genus of about 20 species of *red yeasts.*
- Commonly found on tree leaves, plants, and orange peels.
- Often in high concentrations present in humid environments.
- Form hardly visible populations on surfaces of leaves, where they are dependent upon tiny amounts of leaf-exudates, plus anything that comes to them through air or rain.
- Spores are ejected with force; spores produce satellite colonies.
- Spore release highest during the night.
- Strongly and negatively affected by air pollution, in particular sulphur dioxide. "Since their cells divide fairly often, this suggests that they could perhaps be used to monitor short-term changes in air quality. The number of colonies will reflect the health of the yeast, and so, indirectly, the quality of the air.

Note that lichens, which also get most of their nutrients from air or rain, also reflect air quality, but because they are long-lived organisms, they integrate the effects of pollutants over much longer periods." [Kendrick]

- Cultured colonies grow rapidly and are smooth, often wrinkled, and glistening to dull.
- The bright pink or red to orange colour is typical.
- Optimal growth temperature 25-30° C.
- Dubbed "mirror yeasts" because Sporobolomyces colonies form new colonies on opposite plates [placed face to face] that are exactly their mirror image.

SPOROBOLOMYCES ROSEUS **Sporob-r.**

Scientific name Sporobolomyces roseus Kluyver & van Niel 1924.
Family Sporobolomycetaceae.

KEYS

- Rose-coloured yeast.
- Mirror yeast.
- Bad-weather fungus.
- Releases large amounts of spores in late summer and during sultry nights.
- Allergen.

FEATURES

- Colonies rose-coloured.
- Known in Germany as "Schlechtwetterpilz" [bad-weather-fungus] for its occurrence on damp leaves and having its main sporulation in late summer. It releases large numbers of spores during sultry nights.
- Allergen and irritant; produces type I and III allergic reactions.

Rose-coloured yeast. Mirror yeast. Bad-weather fungus. Releases large amounts of spores in late summer and during sultry nights. Allergen.

SPOROBOLOMYCES SALMONICOLOR

Sporob-s.

Scientific name Sporobolomyces salmonicolor (Fisch. & Brebeck) Kluyver & van Niel 1924.
Synonym Blastoderma salmonicolor Fisch. & Brebeck 1894.
Teleomorph Sporidiobolus salmonicolor Fell & Tailman 1981.
Family Sporobolomycetaceae.

KEYS

- Salmon-coloured yeast.
- Mirror yeast.
- Allergen.

FEATURES

- Most common species of the genus.
- Colonies salmon-coloured.
- Allergen and irritant; produces types I and III allergic reactions.

Salmon-coloured yeast.
Mirror yeast.
Allergen.

- Occasionally causes infections [lymphadenitis] in patients with AIDS. Dermatitis, cerebral infection, and fungemia due to Sporobolomyces have also been observed.

I B. FAMILY USTILAGINACEAE

Ustilago maydis

USTILAGO MAYDIS **Ust.**

Scientific name	Ustilago maydis (DC.) Corda 1842.
Synonyms	Uredo maydis DC. 1815.
	Ustilago zeae (Link) Unger 1836.
	Ustilago zeae-maydis G. Winter.
Common name	Corn smut fungus.
Family	Ustilaginaceae.

KEYS

- Dimorphic fungus: yeast state and filamentous state.
- Invades young host tissue, causing hypertrophy and uncontrolled cell division [hyperplasia].
- Forms large, tumour like, black galls.
- Incidence higher in soils high in nitrogen.
- Mutation common.
- Styptic.
- Burning. Bursting.
- Predilection for skin, circulation, and sexual organs.

FEATURES

- Dimorphic fungus with a yeast state and a filamentous state.
- Plant pathogen infecting Zea mays [sweet corn; maize], a perennial grass belonging to the family Gramineae. May infect any part of the corn plant above ground. Although galls may be produced on the stalks, leaves, and tassels, involvement is generally limited to the ears.
- Galls on the stalk and leaves remain small and probably do little damage to the host, while those on the ears do the most damage since they actually replace the kernels. They suck the energy from the development of the other kernels and can destroy the ears completely.

• Produces a mycelium that ramifies intracellularly throughout *young* kernels, causing enlargement of the host cells [hypertrophy] and uncontrolled cell division [hyperplasia].
• Infection is most successful in *embryonic tissues.*
• Whilst *hypertrophy* characterizes Ustilago maydis, Ustilago spp. attacking oats and wheat cause their hosts to become *dwarfed.*
• The combination of hypertrophy and hyperplasia causes large, oddly shaped, tumour like smut galls to appear. [The word 'smut' derives from *Schmutz,* German for dirt.]
• Ripe galls are black, soft, and covered by a silvery grey skin. They contain innumerable dark sooty spores. When shaken the galls scatter the spores as great clouds of dust.
• The black spores, also known as teliospores, are thick-walled resting spores and help the fungus overcome harsh conditions, such as drought and especially winter.
• After a period of dormancy the teliospores germinate in spring to produce yeast-like sprout cells [basidiospores], which, when coming into contact with host tissues form invasive hyphae, which conjugate within the host by means of hyphal fusions.
• If conditions are unfavourable for germination the teliospores may survive for years in the soil or on corn debris.
• The host plant is required for completion of Ustilago's sexual cycle since it is the mycelium produced within the host that carries on the life history of the fungus. The yeast state seems to be of too short duration to continue the life cycle and seldom grows very much.
• Unripe galls [white to grey in colour; inside still moist] are considered a delicacy in Mexico, known as 'huitlacoche'. One person's disease is another person's delicacy.
• Development of corn smut is favoured by dry conditions and temperatures between 25° to 35° C. The incidence of smut is higher in soils high in nitrogen or after heavy application of manure.
• Mutation is unbelievably common in Ustilago maydis. "In this smut mutability and constancy are governed by genetic factors, as has been determined from the results of numerous crosses between monosporidial lines of opposite sex. Stakman and his associates conclude, ' *Ustilago zeae* definitely comprises an indefinite number of biotypes that differ either widely or slightly in every observable character or combination of characters. New ones are continually being produced as a result of mutation and of recombinations resulting from interbiotypic hybridization." [Wolf & Wolf]

SMUTS OR DUST-BRANDS

• The black galls and the great mass of black spores give the infected part a burned or charred appearance, to which the fungus owes its name, Ustilago meaning 'burning'.

Like the Bunt of the wheat [fungal disease known as 'stink-brand'], smuts were charring, burning or blasting diseases which were sometimes referred to, collectively, by an old name, common to both English and German - the 'Brand' diseases of cereals.

> Although so dependent on moisture for their development, the Brand diseases had always been likened - with some stretching of the imagination - to the results of burning or fire. They fell into two fairly distinct categories: the Smuts or Dust-Brands, which, according to their kind, either converted the substance of the grain alone into black dust or reduced whole ears to charred skeletons; and the Rusts, or Rust-Brands, which streaked the straw and leaf-blades of the plants with dusty pustules which had the colours of charcoal or flame, and which, by exhausting the plants and depriving the ears of their alimentary chyle, caused shrivelling of the grain.
>
> ... Where the Bunt-balls remained intact until threshing time, the spores of the Smut were ripe when the wheat was in flower. They were blown about the field as a black dust by the wind, the chaff came away, and only the bare and blackened rachis of the smutted ear remained at harvest. ... Fortunately the Loose Smut was not nearly so serious as the Bunt. Berkeley mentioned in 1856 that the English farmers took little notice of it, and even had a superstitious belief that a little Smut in a wheat field augured well for the crop in other respects. They said that, much as they said that when the moon was on its back it was filled with rain. Sometimes, when the moon tipped its contents, and the Smut was unusually bad, there would be 'black rain'. Clouds of spores, lifted by the wind, were washed down again. But black rain was rare enough for it to be regarded as a supernatural occurrence.
>
> [Large 1962]

THERAPEUTICS

• Whereas John Gerard in his *Herbal or General History of Plants* [1597] dismisses Ustilago as "altogether unprofitable and good for nothing, an enemy unto corne, there is nothing else but blacke dust, which spoileth bread, or whatsoever is made thereof," 19th-century reports of the abortifa- cient properties of the fungus inspired the homeopathic physician William H. Burt to conduct a proving and to introduce the drug into clinical practice in the 1860s.
Due to the "efforts of the Homeopaths" Ustilago had a brief period of popularity among the Eclectics during the last decade of the 19th century as a uterine tonic and an obstetric.
Its medicinal activity was considered similar to that of Claviceps [ergot] but weaker and consequendy safer.

• Ustilago maydis was made official in the *U.S. Pharmacopeia,* 1882-94, for the same purposes as the Zuni Indians had used it traditionally:

> [Corn smut is] given to women during parturition to hasten childbirth by increasing the severity of labour. It is given also to stop haemorrhage after childbirth, and for abnormal lochial discharge. The treatment is the same for all three ailments - a pinch of Ustilago is put into a small quantity of warm or cold water and the infusion is taken in intervals.
> [Stevenson, cited in: Virgil J. Vogel, *American Indian Medicine;* Norman, 1970]

• On its biological activity, Felter & Lloyd wrote:

> Ustilago appears to possess decided activity, its effects having been compared with those of ergot and mix vomica combined. Upon the lower animals it acts as a spinal excitant, producing tonic convulsions, and destroying life, either by tetanus or exhaustion. Full doses dilate the pupils. Ecbolic properties are conceded to it, and, by many, it is preferred to ergot for *obstetrical uses,* inasmuch as it appears to be less powerful, and to produce clonic instead of tonic uterine contractions. According to Ellingwood, with whom it is a favourite remedy, it produces perfectly regular intermittent and safe contractions.
> The following statements [since confirmed by other investigators] have been made concerning this agent: "Its action on the uterus is as powerful

as the ergot of rye, and perhaps more" [Lindlay]. "Its use is attended with shedding of the hair, both of man and beast, and sometimes even of teeth. Mules fed on it lose their hoofs, and fowls lay eggs without any shells" [Roulin]. "It is doubdess by its abortifacient power that it causes the eggs of fowls to be extruded before there has been time for a shell to be formed. By what power does it cause the shedding of the hair of man and brute animals, and the casting off of the hoofs of mules long fed upon it?" [Prof. Tully]. "In a cow house, where cows were fed on Indian corn infested with this parasite, 11 of their number aborted in 8 days. After their food was changed none of the others aborted" *(Annal. Med. Netr. Beige,* and *Rep. de Ph.).* The better to be convinced of the poisonous nature of this fungus, the author, after having dried and pulverized the drug, administered six drams to two bitch dogs with young, which soon caused them to abort" [Dr. H. W. Burt, *Amer. Homoeop. Obs.,* 1868, p. 305].

[King's American Dispensatory]

• Ustilago maydis contains ustilagic acid, an antibiotic substance that shows *in vitro* activity against the yeast *Cryptococcus neoformans,* the yeast-like fungus *Candida albicans,* and some saprophytic fungi.
Another Ustilago compound, ustilaginic acid, is used as starting material for artificial musk synthesis.

• Hobbs states that Ustilago maydis "has been reported to have antitumour activity in animal studies, and to improve digestion and alleviate constipation." He says that "corn smut is also known in Chinese medicine, perhaps for thousands of years. Eaten stir-fried, it is said to have a cold energy, and be a tonic to the liver, stomach, and intestines. When eaten regularly, it is thought to cure hepatic and gastroenteric ulcers, as well as having a mild laxative effect."

MATERIA MEDICA

Proving

[1] Burt, 1868; crude drug, lx and 2x, in increasing doses; 2 provers [Burt himself, and 1 female].
[2] Hoyne, 1872; 2x trit.; 6 provers [5 males, 1 female]. Six more provers were involved, but none of them obtained any symptoms from the drug.

Hale's criticism that "none of the provings were made on a healthy female organism" refers to the fact that Miss K.O.'s participation in Burt's proving was because of "a uterine tumour of enormous size." After taking first the 2x trit, for 3 weeks and then the lx trit, for another 3 weeks, the tumour "was reduced one-third in size and was greatly relieved of its sensitiveness."

Affinities

Sexual organs. Circulation. Epithelium [skin; hair; nails].

Through its action on the arterial and venous vascular capillaries, Ustilago has a specific and marked action on the skin. The whole skin becomes dry, hot, and congested. Eruption all over the skin similar to rubeola. By rubbing any part of the body a few moments, it would break out with this fine red eruption. On face and neck, it came in patches like ringworm [herpes circinatus] , but not vesicular.

Dimorphic fungus. Yeast state and filamentous state. Invades young host tissue, causing hypertrophy and uncontrolled cell division [hyperplasia]. Forms large, tumour like, black galls. Incidence higher in soils high in nitrogen. Mutation common. Styptic. Burning. Bursting. Affinity for skin, circulation, and sexual organs.

The eruption is about the size of a pin's head, itches violently at night, and constantly remains red and hard. The chest and joints are more affected than any other parts of the body. The whole scalp became one filthy mass of inflammation; two-thirds of the hair came out; and what was left in was mostly matted together. A watery serum kept constantly oozing from the scalp, so profuse as to keep the hair constantly wet. [Burt]

Its action on the skin appears to be very intense. Dr. Burt's statement of its supposed effects on the scalp, where an eruption appeared, discharging a watery serum, matting the hair together, and causing it to fall out, seems to confirm the statement of the authorities above quoted relating to its effects. But Burt's case has not been verified by others, for the Ustilago has been given to patients in similar doses for a long time, without

The statement of Tully, Roulin and other trustworthy writers, that it "causes mules to shed their hoofs, and men and animals to lose their hair and teeth," must be accepted.

The hair, hoofs, nails and teeth, are but prolongations of the true skin. Any drug which profoundly affects the skin, will probably affect similar structures. Ustilago appears to act by preference upon the thickest and hardest of the dermoid tissues. Its action in this respect resembles the effects of such

diseases as ichthyosis, syphilis and tuberculosis.

Therapeutically the Ustilago will be of probable value in alopecia, tumours of the scalp, and some severe eruptions.

It has been found curative in urticaria [large, pale welts], "It caused an eruption similar to rubeola," says Burt. I advise it in painful and destructive diseases of the nails. It is possible that it may be useful in those instances where young children lose their teeth soon after dentition, especially if they decay at the root first, become loose, and finally fall out. [Hale]

= The Repertory mentions red, copper-coloured spots [rubeola]; circumscribed pigmentation following eczematous inflammation; eruptions with nocturnal itching; and urticaria aggravating or appearing during menses and/or at climacteric.

» Paraesthesia of the skin; pricking, burning, itching, a marked erythema of skin of the uncovered parts of the body [though it may also appear on the covered parts], leaving by and by the skin parchment-like, dark brown and with cracks, < warmth.

SYMPTOMS

Mind

= Irritable and disinclined to talk.

"Could not take hold of anything with energy; had nothing particular to complain of."

"Almost everything goes wrong."

® Irritability when questioned, when asked to repeat anything and when spoken to.

« Irritability at orgasm.

= Irresistible tendency to masturbation.

"Says he can't break off habit; has no control of himself when passion is aroused." [Hering]

= Erotic fancies and erotic dreams, & spermatorrhoea.

=> Talking about women causes an emission.

=» Seeks solitude to practise masturbation.

Here is a little experience I had with a masturbator of twenty years' standing, who "simply could not resist the temptation to masturbate." He had

been married seven years; they had three real nice, bright, well-nourished children; he said he could have intercourse every night and yet during the day he had to masturbate. I tried various of our medicines on him with no results. He didn't seem to show any signs of degeneracy, always was neat and careful of his appearance, held an important position in an office, and wanted help, as he said he hadn't the ambition to quit himself.

> As I said, I tried various remedies on him until I accidentally stumbled on his symptom, "an irresistible desire to masturbate," under Ustilago, and the next prescription he had was some of it to be taken two to four times a day until all gone, then report. The report was like this: "Well, doctor, I guess you hit my case this time, as I have had no occasion to worry since the first day I took the medicine." I put up another three-dram vial and told him to take only when the desire comes on. This was over a year ago and he hasn't emptied the vial. The first report looked good to me, but the other day he told me he hadn't masturbated in a year and the desire comes but seldom. I have tried it on one or two others with good results, but cannot say it would be a specific, but think it worth reporting.
>
> [GJ. Wenzlick, 'Ustilago in Masturbation', letter to the Editor; Hom. Rec., vol. 25, no. 11, Nov. 1910]

Temperature

= Aversion to or aggravation from warmth in general.

-» Flushes of heat. Congestion of blood. Leading to haemorrhages, particularly during orgasm.

= Faintness and oppression in warm room.

= Sensation of heat as if hot water were flowing along spine.

= Whole skin dry, hot and congested.

= Heat over body.

& Restless sleep and tossing about.

> "Towards the middle of the day was seized with great internal heat [pulse normal] over the whole body, but especially in the eyes; in the afternoon, internal heat gone; at night, internal heat; this feeling of general heat seems to come and go at short intervals [two to four hours], [2nd day], [proving Hoyne]
>
> "Heat over the entire body, at night; I threw off the bed-clothes during sleep, and on waking found myself exceedingly warm." [proving Hoyne]

Appetite & Thirst

» Loss of appetite # ravenous appetite.
& Thirst at night.
"Had to get up in the night to drink, was so thirsty." [Burt]
& Thirst for cold water.
== Craving for hearty food and acids.
"Towards night felt a strong desire for acid food, and ate an apple, which stopped this craving; at the same time had a craving for hearty food, which left on eating the apple [4th day]." [proving Hoyne]

Sensations

«= Of contraction in vertex.
= As if top of head were being lifted off.
» Of a lump in throat/larynx [when swallowing].
» As if root of tongue were being pressed upward.
= As if intestines were tied in a knot.
= Of a ball in uterus.
·» Uterus as if drawn in a knot.
[For being at odds with oneself the Dutch use the expression "met zichzelf in de knoop zitten," literally: being knotted up with oneself.]

Pains

== *Burning.*
>» *Pressing.*

Modalities

«Touch and pressure < [eyes; abdomen; uterus; ovaries].
" Menstrual period < [vertigo; headache; abdominal pain; pain in breasts; backache].
=» Walking < [frontal headache; pain in left inguinal region; pain in lumbar region].
= Breakfast > [stuffed feeling in head].
= Pressure > [epistaxis with bright blood].

Menstruation

= Blood bright red, or with dark clots.
" Blood stringy and ropy; forming long black strings.
= Passive [uterine] haemorrhages, "which may in some cases take on an

active form." [Burt]
& Lassitude.
& Knotted sensation internally [uterus].
"The big, black, gnarled knots on the ears of corn really look like what women may describe as feeling inside." [Laurie Dack]

■» *Menses* too profuse, of long duration, dark, fluid, passive haemorrhage.
Before the flow there is pain from hip to hip [ovaries], which > when flow *commences.*
After the flow there is backache of a heavy dragging character,
< exertion; there is vertigo and constant misery under the left breast at the rib's margin.
[Hurd, *Pacific Coast Journal of Homeopathy,* July 1937]

= Profuse menses; < motion; with gushes of bright- red blood when rising from a seat, or after having been startled or frightened. No flow of menses when lying still.

«· Menses too frequent and profuse; during orgasm.
& Vertigo.

Dryness
= Scalp.
== Nostrils.
= Throat; at night; & difficulties swallowing.
= Dry, burning sensation all along oesophagus to stomach.
== Hands.
= Whole skin.
= Stools dry, black, lumpy.

Head
= Feeling of fullness in head.
< Morning; walking.
& Dull, pressive frontal headache.
& Aching in eyeballs, and lachrymation.
& Distress in epigastrium; "probably from excessive acidity." [Burt]
<- Congestive headache before and during menses.

Throat
= Frequent attacks of *tonsillitis*

> "The tonsils seem to be her weakest parts. They are congested and enlarged. The left tonsil is especially affected. It looks large and dusky and the pain on swallowing is intense. It is of a lancinating character and it extends from the tonsil to the ear. The throat is dry and there is the feeling of a lump behind the larynx which makes her swallow constantly." [Choudhuri]

Peculiars
" Vertigo & whirling before eyes or diplopia.
" Myriads of white specks before the eyes that blot out everything else.
» Nystagmus; eyes seem to revolve in circles and dart from object to object in quick succession.
= Spots dancing to and fro before the eyes.
« Uterus remains large after miscarriage or confinement; subinvolution delayed.
« "I believe it will prove one of our best remedies in a tendency to miscarriage. I allude to an habitual tendency to abort at periods corresponding to the menstrual; or to loss of the foetus from the slightest overexertion, at any time, or from the shock of mental emotions." [Hale]

CASES - expanding, bursting and yet no relief from discharging

"Laurie Dack [Canada] presented at the 1991 IFH Professional Case Conference three cases of uterine fibroids and heavy, protracted bleeding cured with Ustilago. The language used by these women in explaining their condition provided distinct clues. Laurie Dack: "The specific images in the language can often be extremely expressive, and they can indicate a direction for discovering the correct prescription."

Here are some of the specific images.

> Analysis of Case 1.
> She seemed convinced that the hysterectomy was an inevitability. She felt "stuck with it." What stood out to me was her initial description of "being stuck between a rock and a hard place," an expression that seemed to

describe her situation. This idea recurred again and again throughout her case. This sense of being stuck, of nowhere to move, and of defeat was indicated over and over by her choice of words, such as:

"...a huge knot in my uterus that keeps getting larger and larger even though the blood keeps pouring out."

"...like a football stuck in my belly."

"This belly feels like a huge knot, and it's just growing and bleeding."

"...like I'm not going anywhere. I feel at a standstill." "It feels all knotted up."".....

She uses the same expressions to describe her uterine problems and her emotional state - the sense of a "knot," of being "stuck inside even though everything is pouring out."

Another indication of her sense of "being stuck" is her strong preoccupation with sex, her lack of sex life because of her heavy menstrual flows, and the unfulfilled sexual fantasy life that had grown out of this situation. The heavy, protracted menses, in her words, "...goes from one period to the next. It just flows and never seems to stop, so we hardly ever make love."

Analysis of Case 2

What struck me about this woman were her expressions - the vivid descriptions in her language. She constantly alludes to feelings of expansion - of everything being too much, of feeling like a balloon about to burst, of blowing up - while also feeling small and helpless, with nowhere to move. The picture of a full balloon, with a little more air being pumped in each month and ready to pop at any moment, together with the feeling of being too small, too tight, and too irritated to deal with it, forms a perfect description of her total situation.

Her headaches feel as if her forehead will burst open or the top of her head will fly off. Her menstrual flow is too much and too overwhelming; the situation at home is too big to handle; the clots are the size of her fist; and her uterus is expanding bigger and bigger no matter what she does.

I have an image of a "little person in a box," as she refers to herself. The person is growing bigger and bigger - ready to burst - but she can't move because she feels trapped within the confinement of her marital situation. The two opposing forces create the stress and the pathology.

Analysis of Case 3

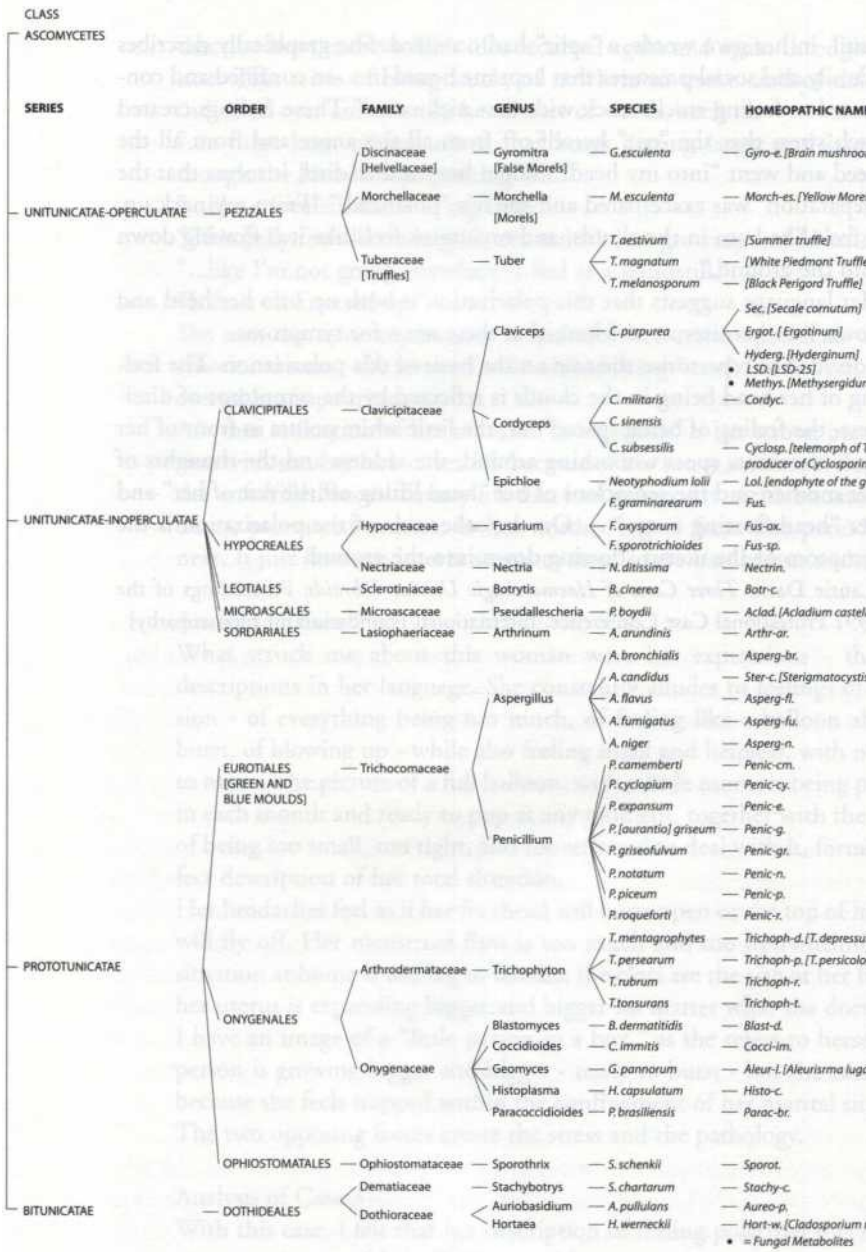
With this case, I felt that her description of feeling polarized was such an accurate picture of herself. The outside pressures seemed to push on her

until, in her own words, a “split” had occurred. She graphically describes “family and social pressures that kept me boxed in ... so confined and congested ... feeling stuck, stuck with that nickname.” These feelings created such stress that she “cut” herself off from all the anger and from all the need and went “into my head.” When her mother died, it seems that the “separation” was exacerbated and she felt “polarized.” “From my neck up, it feels like I am in the clouds, and my uterus feels like it is flowing down into the ground.”

Her language suggests that this polarization is both up into her head and down into her uterus, so I looked at these areas for symptoms.

I decided to repertorise the case on the basis of this polarization. The feeling of her head being in the clouds is reflected by the symptoms of dizziness, the feeling of being spaced out, the little white points in front of her eyes, the white spots whooshing around, the sadness and the thoughts of her mother, and the sensations of her “head lifting off the rest of her” and her “head floating away.” ... On the other side of the polarization is the symptom of the uterus “flowing down into the ground.”

[Laurie Dack, *Three Cases of Haemorrhagic Uterine Fibroids*, Proceedings of the 1991 Professional Case Conference, International Foundation for Homeopathy]


CLASS
ASCOMYCETES
SERIES
ORDER
FAMILY
GENUS
SPECIES
HOMEOPATHIC NAM
UNITUNICATAE-OPERCULATAE
PEZIZALES
Discinaceae [Helvellaceae]
Gyromitra [False Morels]
G.esculenta
Gyro-e. [Brain mushroo
Morchellaceae
Morchella [Morels]
M. esculenta
Morch-es. [Yellow More
Tuberaceae [Truffles]
Tuber
T.aestivum
[Summer truffle]
T. magnatum
[White Piedmont Truffl
T. melanosporum
[Black Perigord Truffle]
UNITUNICATAE-INOPERCULATAE
CLAVICIPITALES
Clavicipitaceae
Claviceps
C. purpurea
Sec. [Secale cornutum]
Ergot. [Ergotinum]
Hyderg. [Hyderginum]
LSD. [LSD-25]
Methys. [Methysergidu
Cordyceps
C. militaris
Cordyc.
C. sinensis
C. subsessilis
Cyclosp. [telemorph of
producer of Cyclosporin
Epichloe
Neotyphodium lolii
Lol. [endophyte of the g
HYPOCREALES
Hypocreaceae
Fusarium
F. graminearearum
Fus.
F. oxysporum
Fus-ox.
F. sporotrichioides
Fus-sp.
Nectriaceae
Nectria
N. ditissima
Nectrin.
LEOTIALES
Sclerotiniaceae
Botrytis
B. cinerea
Botr-c.
MICROASCALES
Microascaceae
Pseudallescheria
P. boydii
Aclad. [Acladium castel
SORDARIALES
Lasiophaeriaceae
Arthrinum
A. arundinis
Arthr-ar.
EUROTIALES [GREEN AND BLUE MOULDS]
Trichocomaceae
Aspergillus
A. bronchialis
Asperg-br.
A. candidus
Ster-c. [Sterigmatocysti
A. flavus
Asperg-fl.
A. fumigatus
Asperg-fu.
A. niger
Asperg-n.
Penicillium
P. camemberti
Penic-cm.
P. cyclopium
Penic-cy.
P. expansum
Penic-e.
P. [aurantio] griseum
Penic-g.
P. griseofulvum
Penic-gr.
P. notatum
Penic-n.
P. piceum
Penic-p.
P. roqueforti
Penic-r.
PROTOTUNICATAE
ONYGENALES
Arthrodermataceae
Trichophyton
T. mentagrophytes
Trichoph-d. [T. depressu
T. persearum
Trichoph-p. [T. persicolo
T. rubrum
Trichoph-r.
T. tonsurans
Trichoph-t.
Onygenaceae
Blastomyces
B. dermatitidis
Blast-d.
Coccidioides
C. immitis
Cocci-im.
Geomyces
G. pannorum
Aleur-l. [Aleurisrma lug
Histoplasma
H. capsulatum
Histo-c.
Paracoccidioides
P. brasiliensis
Parac-br.
OPHIOSTOMATALES
Ophiostomataceae
Sporothrix
S. schenkii
Sporot.
BITUNICATAE
DOTHIDEALES
Dematiaceae
Stachybotrys
S. chartarum
Stachy-c.
Dothioraceae
Auriobasidium
A. pullulans
Aureo-p.
Hortaea
H. werneckii
Hort-w. [Cladosporium
= Fungal Metabolites

SUBPHYLUM ASCOMYCOTA [Sac Fungi]

Contains more than 30,000 known species. Mostly terrestrial and saprophytic, occurring on plant and animal remains, on dung, or in soil. *Extensive in growth.* Some species are parasitic on plants. Spores, usually eight, are borne inside a sac [ascus], which is the characteristic sexual reproductive structure of the ascomycetes. There is no universally accepted classification of the Ascomycota. The subdivision into the classes Ascomycetes and Saccharomycetes is adopted here. The class Ascomycetes is divided into four series, depending on the structure of the asci, as reviewed by Kendrick.

CLASS ASCOMYCETES

Series Unitunicatae-Operculatae

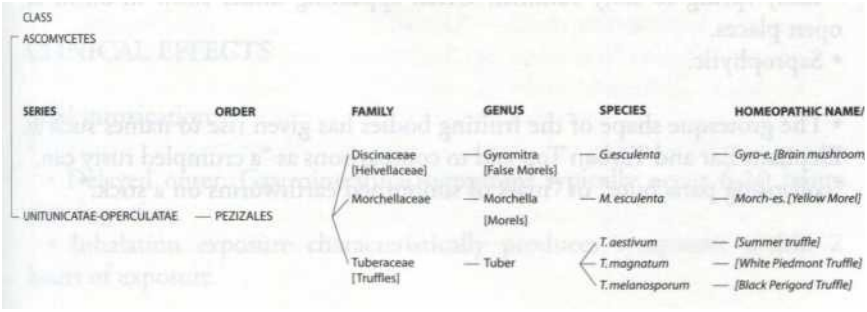
Unitunicate-Operculate Asci have a single wall with a built-in lid or operculum at the tip - at maturity the lid pops open to eject the spores.

I. ORDER PEZIZALES

Contains 900 species in 150 genera.

I A. FAMILY DISCINACEAE [Helvellaceae]

Gyromitra esculenta



GYROMITRA ESCULENTA **Gyro-e.**

Scientific name	Gyromitra esculenta (Pers.:Fr.) Fr. 1846.
Synonym	Helvella esculenta Pers. 1801.
Common names	False Morel. Brain Mushroom. Beefsteak Morel.
Family	Discinaceae.

KEYS

- Saprophytic.
- Grotesque shape. Stalked brain. Brain Mushroom.
- Small clouds of spores during spells of dry [warm] weather.
- Likes the cold. [Warmer temperatures seem to reduce its toxicity.]
- Volatile. Rocket fuel.
- Severe gastrointestinal symptoms.
- Unquenchable thirst.
- Night <.
- Resembles Phosphorus.

FEATURES

- "Stalked brain." Cap lobed, convoluted and brainlike, yellow-brown to reddish.
- Cap grows darker with age; may turn very dark brown.
- Stalk short, white, reddish; hollow, smooth or slightly grooved.
- Spores light yellow.
- Spore dispersal in "small clouds" during dry [warm] weather.
- On ground or rotten wood in forests, especially pine forests. Sometimes in clearings or dune slacks.
- Common in northern latitudes in montane coniferous forests.
- Early spring to early summer. Often appearing under snow in burnt or open places.
- Saprophytic.

- The grotesque shape of the fruiting bodies has given rise to names such as Elephant Ear and Turban Top and to comparisons as "a crumpled rusty can," "collapsing parachute" or "mass of sunburned earthworms on a stick."

TOXINS

• The specific name *esculenta,* edible, might be a misnomer because the mushroom is deadly under certain conditions. Serious poisoning cases are, however, relatively rare, in spite of it being extensively eaten. In Sweden, cooked and canned False Morels are sold in supermarkets, whilst marketing the fungus is prohibited in Germany and Switzerland. Most of the serious intoxications have occurred after the consumption of raw or insufficiently cooked fungi. In Sweden alone, about 200 poisoning cases are reported each year, yet fatalities are very rare. In the past, gyromitrin-containing mushrooms have been associated with significant mortality in Eastern Europe; mortality rates from 10-40% have been reported.
The degree of toxicity of Gyromitra is very difficult to assess, says Schenk, "since this varies with the age of the fungus, the nature of the soil on which it grew and the individual susceptibility of the consumer." The climate might also be a factor in its toxicity because studies from Finland seem to indicate that warmer temperatures reduce the concentration of toxins.

• Fresh Gyromitra must be boiled twice with water. The water must be discarded and the toxic vapours of the boiling fungi avoided! Dried fungi may nevertheless still contain trace amounts of toxins.
Five per cent of the volatile constituents of the fresh fungus consist of the toxic hydrazones, including gyromitrin. Gyromitrin rapidly decomposes in the stomach to form acetaldehyde and N-methyl-N-formylhydrazine, which is converted to monomethylhydrazine [MMH], MMH is a water-soluble toxin that causes gastroenteritis, haemolysis, hepatorenal failure, seizures, and coma. The use of MMH in *rocket fuel* has caused similar toxicity in aerospace industry workers. "Thus, like rockets, MMH-containing mushrooms have the potential of moving the human body from an earthly existence to heaven," remarks John Trestrail.

CLINICAL EFFECTS

Mild intoxication:

- Delayed onset. Gastrointestinal symptoms typically occur 6-10 hours after ingestion.
- Inhalation exposure characteristically produces symptoms within 2 hours of exposure.

- GI symptoms prominent, lasting 1 to 3 days and consisting of
  Bloating/ bloated feeling.
  Persistent nausea and vomiting.
  Colicky or tearing abdominal pain [epigastrium and hypogastrium].
  Watery then bloody diarrhoea; may progress to cholera-like syndrome.
- Accompanying symptoms:
  Confusion.
  Drowsiness/ fatigue.
  Dizziness.
  Headache.
  Tachycardia.
  Muscle cramps [due to dehydration].

In severe cases this may be followed [in 2-3 days] by hepatorenal and neurologic symptoms.

- Dry skin with poor turgor [from vomiting and fluid losses].
- High fever.
- Pallor [from haemolysis].
- Cyanosis unresponsive to oxygen [from methemoglobinemia].
- Jaundice [from liver damage and haemolysis].
- Liver and spleen enlarged and sensitive to pressure.
- Extreme weakness.
- Tremor; muscle spasms.
- Ataxia.
- Seizures; delirium.
- Stupor and encephalopathy.
- Muddy-coloured urine [from haemoglobinuria].
- Chocolate-coloured brown blood [from methemoglobinemia].
- "Ear-splitting screams or great difficulty in breathing announce the patient's approaching death." [Schenk]
- Thirst; difficulty in swallowing; livid discolouration of face; disturbances of vision; coldness of limbs. [Lewin]

• "The picture resembles rather closely that of cholelithiasis and cholangitis." [von Oettingen]

CASE REPORTS

• A report by the Swiss physician, Sven Moeschlin, illustrates the toxic action of Gyromitra esculenta.

> On April 19, 1950, three officers and a sergeant major gathered morels and ate them stewed with butter, without first boiling them. There must have been some *Gyromitra* amongst them, for I myself found a number of typical *Gyromitra* at the spot where they had been picked. The fungi were gathered and eaten the same day. Strenuous night manoeuvres were held in the district on the evening following this feast, and they slept through the remainder of the night without experiencing any ill effects. In the morning, some eight to twelve hours after eating the fungi, all three officers and the sergeant major awoke sweating freely and suffering from nausea, retching, repeated vomiting and severe giddiness accompanied by an intense feeling of depression. On getting out of bed they experienced severe ataxia [unsteadiness in the use of arms and legs] and had to support themselves against walls and furniture; they also had spots before the eyes and double vision. In addition to these symptoms, all the victims suffered from a feeling of constriction in the chest accompanied by stabbing pains. All four had severe watery diarrhoea, as did three N.C.O's who had eaten only one spoonful of the dish apiece.
>
> On examination all the patients exhibited a striking pallor together with slow and stumbling speech.
>
> They could walk only with supports and staggered badly. Pupils rather dilated.
>
> The symptoms of poisoning gradually subsided in the course of twenty- four hours. The sergeant major, who was the most seriously ill, had to be moved to hospital for treatment. For several days after recovery the patients felt perpetually tired with a tendency to break into a sweat at the least exertion.
>
> [Schenk 1955]

• The most extensive review on Gyromitra poisoning was published in 1967 by Franke, Freimuth and List. The authors discuss 513 cases, observed between 1782 and 1965, of which 14.5% were fatal due to severe liver damage. From their review the following symptoms are taken as an addition to the general clinical effects mentioned above.

- Onset of gastrointestinal symptoms in the night, between 11 p.m. and 2 a.m. [This modality, commonly reported, is due to the 6-10 hour latency period of the intoxication.]
- Around midnight fear and distress, followed by violent, persistent vomiting.
- Beside himself, after physical exertion; striking about; can't be approached or touched.
- < Touch. Shrieking or startling from being touched.
- Shrieking [accompanied by tonic and/or clonic cramps] alternating with somnolence.
- Raging delirium.
- Excitement during the night followed by apathy in the morning.
- Vertigo accompanied by violent abdominal pains in the night.
- Vertigo alternating with vomiting.
- Cerebrospinal meningitis.
- Dilated pupils, insensitive to light.
- Right pupil dilated; upper lid of left eye paretic.
- Paralysis of right side of face.
- Swelling of face [cheeks].
- Dryness of mouth [tongue].
- Difficulty swallowing.
- Unquenchable thirst. [Several cases.]
- Vomiting and chills after red wine.
- Vomiting after drinking milk.
- Acute yellow atrophy of liver. [Cause of death in several cases of Gyromitra poisoning.]
- Fatty degeneration of liver; kidneys; myocardium.
- Jaundice accompanied by headache, bellyache and epistaxis.
- Involuntary loss of urine after ceasing of cramps/ convulsions.
- Abortion; stillborn.
- Stertorous respiration.
- Convulsions begin or continue during the night.
- Return of seizures in an epileptic who had been free of attacks for years.
- Long period of sopor followed by violent jactitation.
- Three days of violent vomiting and purging followed by three weeks of being bedridden; took three months to recover from physical weakness.
- Fainting/ unconsciousness after a hot bath.
- Haemosiderosis [iron overload] in liver, kidneys, spleen, bone marrow.

- Chorea-like twitching.
- Fever; body hot, extremities cold.

Sources: 1. S. Franke, U. Freimuth & P.H. List - Uber die Giftigkeit der Friihjahrslorchel Gyromitra [Helvella] esculenta Fr.; Archiv fur Toxikologie 22, 1967, pp. 333-348.
2. N.P. Hamberg & M. Sonden - Giftiga verkningar af stenmurklan; Hygiea, XLV [5], 1883, pp. 289-313.

NEUROTOXICITY

Monomethylhydrazine interferes with vitamin B6, thereby creating a functional vitamin B6 deficiency and leading to reduced GABA levels, impaired neurotransmission and neurotoxicity. [Gamma-AminoButyric Acid is the main inhibitory transmitter in the brain.] Vitamin B6 is important in blood, CNS, and skin metabolism. Alcohol, oral contraceptive pills, and gyromitrin are among its greatest antagonists.
Pyridoxal phosphate - the active form of vitamin B6 in humans - functions as a coenzyme in many reactions, including metabolism of fatty acids, manufacture of haemoglobin in red blood cells, and formation of amino acids used as building blocks for protein. In addition, it regulates the sodiumpotassium balance, preventing water-retention, and inhibits the release of histamine.
Under test conditions, nervous system symptoms of deficiency such as irritability, confusion, nervousness, and numbness of the extremities were observed. Vitamin B6 deficiency can cause convulsive seizures in infants and anaemia, glossitis, numbness of hands and feet, hypoglycaemia, and depression in adults.

MATERIA MEDICA

Source

» Proving Bert Breuker/ students Svenska Skolan for Klassisk Homeopati; 9 female provers, 12c and 30c; 2004; placebo-controlled. [Three of the 9 provers received placebo; they had no reactions.] [Remedy made by Helios, UK]

SYMPTOMS

Main issues

« Wants to fight. Demands answers. Uncompromising. [3 provers]
= Alternating sides. [2 provers]
    Pressing pains in joints of lower limbs.
    Stitching pain in ears, < wind.
    Nose.
== Dryness. [3 provers]
    Eyes; desire to rub, but rubbing <.
    Nose. [2 provers, one of which had 'boring in nose with fingers'].
    Nose alternately dry and discharging watery, excoriating slime.
    Mouth [with much thirst].
    Lips [extremely dry].
    Hands.
= Thirstlessness daytime. [2 provers]
= Sensation of swelling. [3 provers]
    Tongue [related to suppressed anger].
    Mucous membrane nose; < at night.
= Restless sleep; frequent waking. [3 provers]
    With thirst.
    Face slightly red and comfortably warm.
    Pain in calves; in right calf, as if strained.
    Restless legs, esp. knees; must move legs continuously.
    Bad dreams.
    Causeless; difficulties falling asleep again.
~ Fatigue/ sleepiness in afternoon. [2 provers]
= Waking in morning <. [3 provers]
    Great fatigue.
    Swelling of fingers and arms. [Old symptom; had this often during pregnancies.]

Swelling around eyes.
Swelling of face.
Heavy sensation in uterus.
Cramp in right foot.
Pain in calves, as after charging up and down stairs; < beginning to move, touch; > continued movement, rest.

“ Weight gain. [3 provers]
Unwonted sudden weight gain of several kilos.

= Pain in dorsal region. [2 provers]
Between spine and right scapula; as if drawn together or cutting as with a narrow knife; < touch or deep inspiration.

Saprophytic.
Grotesque shape. Stalked brain. Brain Mushroom.
Small clouds of spores during spells of dry [warm] weather.
Likes the cold. [Warmer temperatures seem to reduce its toxicity.]
Volatile. Rocket fuel.
Severe gastrointestinal symptoms.
Unquenchable thirst.
Night <.
Resembles Phosphorus.

Dreams and pictures

“ Flood of rolling stones. [Gyromitra’s Swedish name ‘Stenmurkla’ refers to ‘sten’ = stone.]
“ Accidents; crashing vehicles.
=» Diagnosis of having an incurable kidney [!] disease.
=> People transforming into owls before going to sleep.
« Intrusion; house full of unwanted guests occupying every place to sleep.
= Vampires and paedophiles.
= Yellow and orange [snake; fruits].
« Rockets [!] travelling to remote stars.

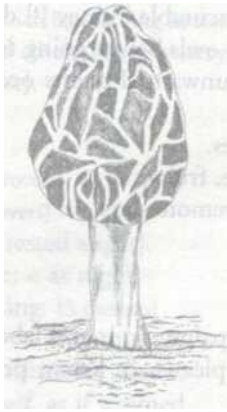
Singular symptoms

« Loquacity, chattering.
= Hurried feeling & heart palpitations and laboured breathing.
“ Restless feeling in solar plexus, & heavy, pressing sensation on chest, > deep inspiration.
“ Sensation of coldness, invading and penetrating into bone marrow.
= Sudden collapse-like condition around 11 a.m. with weakness/trembling of arms and legs, and slight dizziness; > lying down and closing eyes. [Hypoglycaemia?]
= Urticaria-like eruption in face, slight itch, no burning; > washing face in cold water.
= Epistaxis, right side, bright red blood, appearing and disappearing suddenly. = Epistaxis, right side, persistent, followed by obstruction of nose and coryza.

Nausea at night after drinking red wine [two glasses].
“ Stinging in umbilicus, coming and going, < pressure of clothing; followed by small red spots, extremely itchy.
“ Slight uterine bleeding after coition.
“ Pressing pain in ovaries, < lying down in evening.
“ Pain in right ovary extending to back, < touch.
“ Decreased desire for sweets. [Curative response.]
= Wandering joint ache, crosswise [right arm - left leg].

Differentiation

” Symptoms closest to those of Bovista [wants to fight; epistaxis; dryness; swelling; wine <]. Some resemblance with Sticta [dryness nose; boring in nose with fingers; knee joints] and Agaricus [pains crosswise; penetrating coldness].



Morchella esculenta

I B. FAMILY MORCHELLACEAE

Morchella esculenta

MORCHELLA ESCULENTA **Morch-es.**

Scientific name	Morchella esculenta (L.:Fr.) Pers. 1801.
Synonym	Phallus esculentus L. 1753.
Common names	Yellow Morel. Common Morel. Sponge Mushroom.
Family	Morchellaceae.

KEYS

- Saprophytic.
- Favours burnt places.
- More abundant in regions with cold winters.
- Slow development.
- Preoccupation with secrecy.
- Glorious morel madness.
- Gastrointestinal disorders.

FEATURES

- Cap spherical or egg-shaped and hollow; externally furnished with a crisscross network of ridges forming deep pits, pale dingy yellow, buff or fawn.
- Cap joined to stalk along its full length.
- The cavities [pits] resemble those of a weather-beaten honeycomb.
- Stem whitish to pale yellow, hollow, almost even, but thicker at the foot; hollow or stuffed.
- Common on calcareous soils, on sandy soils, in landscaped areas, in open forests, on disturbed ground, and along streams.
- Solitary to clustered.
- "It loves old apple orchards," writes Mcllvaine, "probably because ashes have been used about the trees; ashes and cinders are its choice fertilizers. In Germany peasants formerly burned forests to ensure a bountiful crop. It is found in profusion on burnt hillsides all along the Pacific coast." In 1994 in Alaska, following an unusual spate of forest fires, morels came up in such

unprecedented abundance that collectors were able to harvest more than a pound of morels per minute. How much morels favour burnt places, Ramsbottom discovered to his delight when “morels appeared in my garden at Richmond, Surrey in May 1953 where quantities of paper had been burned!”

- Saprophytic.
- Spring and early summer. Seem to respond to a warming trend following a cold spell, hence particularly abundant in regions with cold winters.
- Morels develop and age more slowly than most mushrooms, over a period of three to four weeks. [Arora]
- Curiously, where elms die from Dutch elm disease, morels thrive and flourish.
- In southern Poland the curious belief is held that morels were created by the Devil, who, badly tempered, chopped an old woman into pieces, from which morels sprang on the places where they fell on the ground.

CONCEALMENT AND GLORY

- A preoccupation with secrecy seems quite typical of morel hunters, although it has also been evoked by other fungi, e.g. Ganoderma, which are hard to find and highly esteemed for their flavour or medicinal virtues. “Part of the lure and lore of mushroom hunting is that when a person finds morels, the secret of that location goes to the grave with him or her,” states Hudler.

> Much has been said about where and when to find morels, but no self-respecting morel hunter will divulge any truly crucial information unless he or she is planning to permanently leave the country [and then only for a stiff price!]. Morel hunters are so protective of their favourite ‘patches,’ in fact, that they regularly disseminate misleading - if not downright erroneous - information, and they practice a presidential evasiveness when asked: “Where did all those morels come from?” Thus any “tips” or “secrets” you manage to squeeze out of morel hunters should be taken with a grain [better make that a bucket!] of salt.
> [Arora 1986]

Aside from secrets to keep there is glory to gain in what Spoerke and Rumack label as “morel madness.”

The appearance of morels each spring bring something beyond mycophil- ia to Michigan and other mostly lowland regions of the U.S. There are festivals and parades, contests and queens, and, of course, lots of morel eating. The National Mushroom Hunting Championship has been held for the last 30 years near Boyne City, Michigan. On a selected weekend in May, a fire truck leads a host of mushroomers to a secret location that has been selected by the Boyne Valley Lions Club. At a signal, the competitors dash off in all directions, picking morels *[Morchella esculenta,* primarily] as fast as they can in quest of the grand prize of $ 125 and glory. You would probably have to come up with 100 or more in the allotted time to be in the running.

CLINICAL MANIFESTATIONS

Saprophytic.
Favours burnt places.
More abundant in regions with cold winters.
Slow development.
Preoccupation with secrecy.
Glorious morel madness.
Gastrointestinal disorders.

• Morchella esculenta, epitome of culinary delight, is highly prized for its flavour and taste, yet has a sinister side, evoking symptoms "severe enough to send you to the emergency room."
Raw, old or undercooked morels cause a typical gastrointestinal syndrome consisting of

- Dizziness and headache.
- Nausea and vomiting.
- Intestinal cramps.
- Explosive diarrhoea.
- Profuse sweating.
- Chills.
- Lack of muscular coordination.

• Allergic reactions from eating cooked morels have been reported.

• Genetically predisposed individuals with deficiency in the enzyme glucose- 6-phosphate dehydrogenase [G6PD], which makes them intolerant of fava beans [favism], are at risk of suffering severe anaemia after consumption of morels. [Favism is most common in the Mediterranean region because of the higher incidence of G6PD deficiencies and the importance of fava beans in the diet there.]

• According to traditional Chinese medicine, Morchella esculenta tones intestines and stomach, reduces phlegm, and regulates the flow of vital energy.

I C. FAMILY TUBERACEAE

Tuber aestivum
Tuber magnatum
Tuber melanosporum

TUBER MELANOSPORUM

Scientific name	Tuber melanosporum Vittad. 1831.
Common name	Black truffle of Perigord.
Family	Tuberaceae.

KEYS

- Symbiotic.
- Adapted to underground lifestyle; no dependency on light.
- Favours low temperatures.
- Distinctive odour and flavour.
- Benefits from shock treatment.
- Daughters of change.
- Male-type pheromones.
- Concealed deceit or hidden divine revelation.

If I cant have too many truffles I'll do without.
[Colette, French novelist]

FEATURES OF TRUFFLES

- Mycorrhizal subterranean fungi forming partnerships with certain hardwood trees, particularly oak, hazel, poplar, and beech.
- Thought to be cup fungi which have gone underground, truffles have subterranean, rounded or ovoid fruiting bodies that look like potatoes ['tuber'] or rocks. Interior solid, marbled, embedded with spore-bearing asci.
- Specially adapted to underground lifestyle through partnership with tree roots for nutrient exchange and with truffle-eating animals for spore dispersal. As such truffles are perfect examples of complex ecology in which trees, animals and truffles depend upon each other.

• Require well-aerated, well-drained, alkaline soils rich in calcium carbonate and with a carbon-nitrogen ratio of about 10:1.
• The spreading hyphae [mycelium] of truffles form a protective sheath around roots of partner trees against disease-causing organisms. The subterranean infusion of the soil with phytotoxic substances inhibits the germination of plant seeds, resulting in the near absence of surface vegetation around the tree, which the French call 'terre brulee' [scorched earth].
• Maturation process takes place *gradually* over a period from several weeks to months, in contrast to above-ground fungi, which develop rapidly due to dependency upon weather conditions.
• Maturity indicated by development of distinctive odours and flavours; often initiated by a period of heavy rain.
• Truffle hunting is closely regulated, the dates being set out by law in France and Italy.
• Tuber melanosporum needs a temperate climate with well-marked seasons, ideally with warm summers and cool winters.
• 'Shock treatment' has been found to help restore former truffle colonies to productivity again, including the use of heavy bulldozers and "having a local basketball team use a piece of ground for their games." The suddenness, brutality and force of certain stresses is evidently beneficial at certain stages of the truffle's biological cycle; hence truffles are regarded "the daughters of change."

TRUFFLE SPECIES

There are about 90 species of true truffles, divided over two families, the Tuberaceae [with one principal genus, *Tuber]* and the Terfeziaceae [with *Terfezia* as the largest genus]. New species are being discovered every year in North America. Many species of truffles are edible and come in a range of heady and intense aromas and flavours ranging from pungent musk to liquorice to tropical fruit. Look-alike species, so-called false truffles, abound; many have strong odours [e.g., like marzipan, garlic, or vanilla], a few are edible, some are poisonous, but humans have never tested the majority.
True truffles are found in Europe, North Africa, the Middle East, Australia, and North America, but only three European species are commercially important. These include the fabled Tuber melanosporum, Tuber magnatum, and Tuber aestivum. The truffles mentioned in the Bible refer to desert truffles of the genus Terfezia, known as "black kame" or "terfez" and eagerly

sought after by desert people as spring delicacies after rainfall.
Tuber melanosporum - the black truffle of Perigord - is a product of the broad oak forests of central and southern France.
Tuber magnatum - the white truffle of Alba, Piedmont - grows in a restricted hilly area of northern Italy and has a slight garlic flavour. Each year a fragrant gift of this land is donated to famous people all over the world.
Tuber aestivum - the summer or scorzone truffle - is native to France, Italy, and Spain. It has a relatively light aroma, but mimics the black truffle with its black exterior and its off-white interior.

TRUFFLE HUNTERS

Elaborating on the ancient idea that truffles were found when the autumn rains come with severe thunderstorms, a 17th century English author thought that "The Wet swells them, and Lightning may dispose them to send forth their particular Scent so alluring to the Swine." Bolts of lightning falling close to trees, however, have not proven to be reliable guides to the location of truffles.

Symbiotic.
Adapted to underground lifestyle; no dependency on light.
Favours low temperatures.
Distinctive odour and flavour.
Benefits from shock treatment.
Daughters of change.
Male-type pheromones.
Concealed deceit or hidden divine revelation.

Owing to the subterranean habits of truffles, the ordinary methods of search are useless, but their characteristic scent enables them to be discovered by either dogs or sows. There are however plenty of competitors, demonstrating, to cite Ramsbottom, "that what in man is usually regarded as a certain refinement of taste is fairly widespread." Many wild animals, including wolf, bear, deer, badger, rabbit, mouse, vole and squirrel, are extremely fond of truffles, to name some of the 60 species of animals known to eat them.
Flies of the genus *Helomyza,* small and usually yellowish, are also tuned in to truffles, since their larvae will eat nothing else. About the time the truffles are ripe, swarms of egg-laden flies may be seen hovering a foot or more above the soil, sometimes for the whole of a sunny day but especially mid-morning and early evening. Truffle hunters use their presence as a sign where to start digging.
The natural instinct of pigs for finding truffles has been much utilised. Pigs pick up the scent from distances up to fifty yards and under six inches of soil. Despite this natural talent, pigs are now replaced by dogs due to the trouble of separating a pig from a truffle it has found. Commitment to the task, moreover, is dubious since pigs readily go astray and dig after a thousand other things. While the taste of the pig for truffles is a natural one, that of

the dog is acquired, to which end its whole training is devoted. Even better than virgin sows and bitches, though, are virgin spinsters whose nose, on smelling a truffle, according to French folklore, turns red and points the way.

PHEROMONES

The odour of truffles is so pungent that it penetrates the shell of eggs and flavours kernels of rice when stored with them in a closed glass jar placed in a refrigerator. Turn a sow loose in an area where there are truffles, and she'll sniff like a bloodhound and then dig with manic passion. What's the sow's obsession with truffles, wonders Diane Ackerman in her grand tour of the realm of the senses. It turns out to be boar scent steroids, the irresistible pheromone triggering the sow's receptivity to the boar, known as alpha-androstenol, produced in the testicles and secreted in the saliva of the boar.

One whiff and the sow goes into steroid overdrive. [From the Greek words *pherein,* to carry, and *horman,* excite, pheromones, or 'excitement carriers', transfer chemical messages between members of the same species. The chemicals are present in humans and many animals and often responsible for aspects of mating behaviour.]

> German researchers at the Technical University of Munich and the Lubeck School of Medicine have discovered that truffles contain twice as much androstenol, a male pig hormone, as would normally appear in a male pig. And boar pheromone is chemically very close to the human male hormone, which may be why we find truffles arousing, too. Experiments have shown that if a litde bit of androstenol is sprayed into a room where women are looking at pictures of men, they'll report that the men are more attractive. For the truffle farmer and his sow, walking above a subterranean orchard of truffles, it must be hysterically funny and sad. Here this beautiful, healthy sow smells the sexiest boar she's ever encountered in her life, only for some reason he seems to be underground. This drives her wild and she digs frantically, only to turn up a strange, lumpy, splotched mushroom. Then she smells another supermacho boar only a few feet away - also buried underground - and dives in, trying desperately to dig up that one. It must make her berserk with desire and frustration. Finally, the truffle farmer gathers the mushrooms, puts them in his sack, and drags his sow back home, though behind the whole orchard vibrates with the rich aromatic lust of handsome boars, every one of them panting for her, but invisible!
>
> [Diane Ackerman, *A Natural History of the Senses;* New York, 1995]

Many researchers think that human pheromone responses are very similar to pigs, which might be why women often call men pigs.

The scent of truffles have been likened to that of "the tousled sheets of a brothel bed" and described as "the muskiness of a rumpled bed after an afternoon of love in the tropics."

The renowned 19th-century gastronome Jean Anthelme Brillat-Savarin, in his 1825 chef d'oeuvre, *The Physiology of Taste,* hints at the erotic properties of the truffle, summing up his tempered opinion as that "the truffle is not a positive aphrodisiac, but it may under certain circumstances render women more affectionate, and men more amiable."

He then recounts the anecdote of a "very clever woman, without any pretensions, virtuous without prudishness," who invites a trusted friend of her husband over for supper, whilst the husband is away on a business trip. After the consumption of the main dish, a magnificent truffled fowl, she reports that the formerly trustworthy gentleman becomes "flattering, unreserved, affectionate, caressing," and starts making advances. She successfully resists him, retaining her virtue, and afterwards comes to the conclusion that the truffles were the culprit: "I blame the truffles for this. I am really persuaded that they were the cause of some predisposition, which might have become dangerous; and if I still eat them - for to abstain wholly from them would have been too severe a punishment - at least I never eat any more of them without being a little careful in the midst of my enjoyment."

A man has to guard three things in life, according to the French: "Ta femme, tes truffes et ton jardin, garde-les bien de ton voisin." [Your wife, your truffles and your garden; guard them well from your neighbour.]

While the black truffle's penetrating aroma has been said to ooze promise of sexual delight, the identification of the responsible chemical, alpha- androstenol, seems less alluring as it was found in the underarm perspiration of men and in urine of women. The perception of androstenol seems to have a greater effect on women than on men, to the extent that women are drawn to it and men repulsed by it. At University College, London, an experiment showed that after being briefly exposed to androstenol, females had more social interactions with males.

Laboratory experiments on the effects of male odours on hormone levels in females performed at the Monell Chemical Senses Center in Philadelphia demonstrated "that the length and timing of the menstrual cycle are markedly influenced by odours from the underarms of males," suggesting a possible link between such responses and the observation that the menstrual cycle of

women living around men is apt to be more regular. In another study, collegeage women wearing a necklace impregnated with androstenol noted an increased likelihood of striking up a conversation with a strange man. Social bonding and behaviour defined on a chemical basis!

Since the enzymes that produce androstenol are also involved in the synthesis of testosterone, it has been argued that affecting the androstenol pathway by means of pharmaceuticals might help resolve defects in the testosterone pathway. Pheromone treatment has thus been proposed to control prostate activity in men to reduce the risk of cancer, in line with the observation that defects in testosterone metabolism are implicated in two very common afflictions of adult human males: prostate enlargement and baldness.

Truffles have at all times been recommended as aphrodisiacs. In parts of the Czech Republic the vernacular name for them means 'lamb testicles'. Species of Elaphomyces [deer truffles] were formerly sold under the name of 'Lycoperdon Nuts' and were said to grow in places where deer had copulated. In certain countries eating truffles was an ancient recipe for inducing pregnancy.

"The beauty of truffles lies in the paradox they offer," one author remarked. "They may be a luxury food, but they ground us, too, reminding us of the earth and uniting us with something primal." In traditional homeopathic literature there is some reference to the possible detrimental effects of "something primal." In *Chronic Diseases,* Hahnemann asserted that "those whose sexual powers are low should limit themselves in eating young chickens and eggs, and should avoid the irritating spice of vanilla, also truffles and caviar, which as palliatives hinder a cure."

Discussing the causes and treatment of uterine cramps and nymphomania, Jahr conceded that truffles "excite and inflame the imagination," along with "feather beds, sleeping too long in the morning, stimulating food or drink, coffee, liquor, chocolate, certain kinds of fish, cinnamon, vanilla, etc.; balls, theatres, novel-reading, a violent and unrequited passion, bad examples, and other influences," all of which may lead "to the development of this horrible disorder."

DIMETHYL SULFIDE

More than 50 volatile components have been identified in black truffles, of which about nine are regarded as key-flavour compounds. According to Thierry Talou, a chemist at the National Polytechnic Institute of Toulouse, it is not the sex hormone androstenol that attracts sows to truffles, but a

number of characteristic sulphides such as 2,4-dithiapentane, in dilution reminiscent of garlic, and, notably, dimethyl sulphide [synonyms: methyl sulphide, dimethyl monosulphide, thiobismethane]. The latter aroma compound, which pigs seem to like a lot, is known from cooked cabbage, Brussels sprouts, dried legumes, asparagus, canned corn, cheddar cheese, egg, parsley, celery, and identified as a volatile component of fresh strawberries as well as mutton, chicken, beef, and pork. In addition, although of no significance to pigs, dimethyl sulphide is also present in beer and almost all wines, where it is formed during fermentation of yeast. The romantic smell of sea drifts is likewise attributable to dimethyl sulphide as an algal/cyanobacterial excretory product. It is the major volatile reduced organic sulphur compound in open ocean, coastal waters, and marshlands, and its emission from surface water represents a major flux of biogenic reduced sulphur to the atmosphere.

Talou identified the chemical components of the truffle aroma, synthesised the nine most important ones and mixed them into a cocktail. He next buried samples of the cocktail at various points under an oak tree, real truffles at other points, and samples of androstenol at still others. The experiment showed that pigs grubbed with equal enthusiasm for the real truffles and the synthetic scent, while ignoring the androstenol. It can be questioned, however, whether such experiments prove the belief in the aphrodisiac properties of truffles to be hogwash or whether they demonstrate that even pig's noses can be fooled.

A skin, eye, nose, gastrointestinal and respiratory irritant, the most probable route of human exposure to dimethyl sulphide are ingestion of foods containing the compound and inhalation of contaminated air. Headache, dizziness and decreased ability to concentrate may occur. In experimental animals, absorption of large quantities can lower body temperature, reduce motor activity, and inhibit certain enzymes. Formed by intestinal bacteria, the compound may inhibit other types of bacteria, such as Streptococcus.

LE TARTUFFE

Moliere, pseudonym of Jean-Baptiste Poquelin [1622-1673], named his estate 'Perigord,' after an area in southwest France famous for its black truffles. He used the old French name for a truffle for the main character, a religious hypocrite, in his comedy 'Le Tartuffe ou 1'Imposteur,' probably because of its concealed development. On the other hand, the name Tartuffe

has been traced back to an older word associated with liar or charlatan: truffer, ‘to deceive’ or ‘to cheat’.

The story goes that Moliere came to associate the truffle with false pretences while having dinner with the papal nuncio [an ambassador from the pope] when a peddler came along with truffles to sell. Two pious ecclesiastics, sitting at a nearby table with an air of pretended mortification, came out of their devout silence when hearing the word truffles and exclaimed, ‘Tartufolli, tartufolli, signor nuncio!’ in the belief to display their knowledge of the Italian language by calling out, ‘Truffles, truffles, signor nuncio,’ whereas what they really said was ‘Hypocrites, hypocrites, signor nuncio.’ Moliere seized upon the name ‘Tartuffe’ as suitable for the hypocritical impostor in his comedy with the intention to “perform a service for all good men” in order “to denounce hypocrites and to place in proper view all of the contrived poses of these incredibly virtuous men, all of the concealed villainies of these counterfeit believers who would trap with a fraudulent piety and a pretended virtue.”

The play portrays the pious crook Tartuffe who is so firmly established in the bourgeois household of the credulous Orgon that he promises him his daughter Mariane and disinherits his son. Orgon’s wife Elmire begs Tartuffe to refuse Mariane’s hand, and he attempts to seduce her. Caught red-handed, Tartuffe recovers by masterly self-reproach and persuades Orgon not only to pardon him but also to urge him to see as much of his wife as possible. Orgon doesn’t want to see the truth about his deceitful trustee and signs over his entire property to him, which prompts Tartuffe to turn the family out of the house and try to have his former benefactor arrested. But by royal intervention, the arresting officer apprehends Tartuffe instead, and the impostor is hauled off to prison.

Contrary to the perception of truffles as concealed deceit stands the old belief of truffles being created by divinely wielded thunderbolts, which made them symbols of hidden revelation. The fact that they grew round the roots of the sacred oak-tree enhanced their god-given nature, as did their scent and flavour because both owed nothing to human cultivation and consequently were a divine gift.

Series Unitunicatae-Inoperculatae

Unitunicate-Inoperculate Asci lack an operculum but have instead an elastic ring mechanism, letting the spores shoot through at maturity.

ORDER CLAVICIPITALES
ORDER HYPROCREALES
ORDER LEOTIALES
ORDER MICROASCALES
ORDER SORDARIALES

L ORDER CLAVICIPITALES

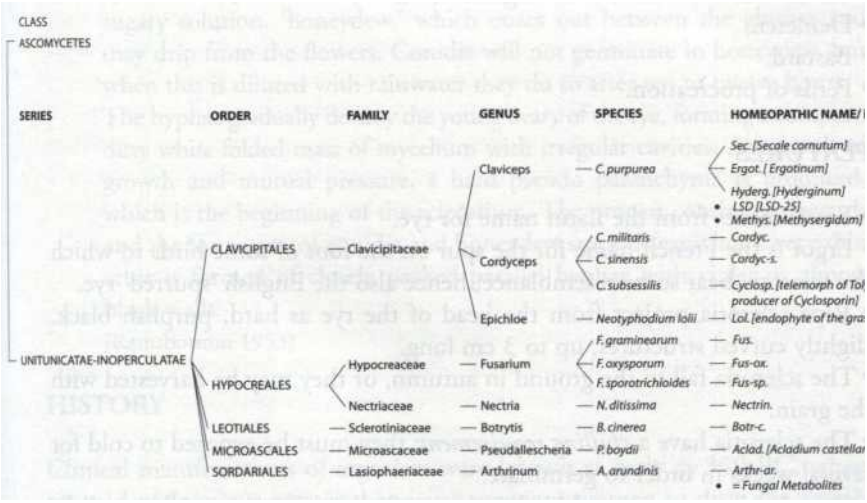
Contains 270 species in 27 genera comprising a group of highly evolved and sophisticated, obligately parasitic fungi. There is disagreement about the status of the Clavicipitales. They are classified as a separate order, or, in other systems, included as the family Clavicipitaceae in the order Hypocreales.

I A. FAMILY CLAVICIPITACEAE

Secale cornutum [= Claviceps purpurea]
Ergotinum
Hyderginum
LSD
Methysergidum
Cordyceps militaris
Cordyceps sinensis
Cyclosporinum
Neotyphodium lolii

FEATURES OF THE GENUS CLAVICEPS

- Genus of about 35 parasitic fungi not found apart from host in nature and causing ergot of rye and other grasses.
- Invades florets and grows through stigma, imitating pollen tubes. Timing of invasion is critical: approximately coincidental or just prior to pollination.
- Colonizes the *ovary* of the host and replaces it with fungal mycelium.
- Forms resting structure [ergots'] on host florets which fall to the ground in the autumn and overwinter.
- The sclerotia [ergots] protrude from the florets resembling dark or dark brown seeds.
- Ejects spores after germination of sclerotium in the spring; the wind-disseminated spores land on host florets and the cycle starts anew.
- Sclerotia contain high concentrations of three types of alkaloids.
- The fungus is inconspicuous in the younger stage; can only be detected by the presence of a sticky, spore-containing exudate [honeydew].
- The honeydew attracts insects and thus the spores are spread.



SECALE CORNUTUM **Sec.**

Scientific name	Claviceps purpurea (Fr.) Tul. & C. Tul. 1853.
Synonym	Spaeria purpurea Fr. 1823.
Common name	Rye ergot.
Family	Clavicipitaceae.

NOTE: The name Secale cornutum was introduced by Baldinger and frequently used until it was elucidated by Tulasne, who named the fungus Claviceps.

KEYS

- Parasitic on grasses, mainly rye.
- Replaces ovaries of host.
- Must be exposed to cold in order to germinate.
- Copper deficiency.
- Holy or hellish visionary/ convulsionary.
- Cardiovascular and/or neurological effects.
- Demeter.
- Bastard.
- Perils of procreation.

FEATURES

- *Secale* comes from the Latin name for rye.
- Ergot is the French name for the spur on the foot of some birds to which the sclerotia bear some resemblance; hence also the English 'spurred' rye.
- Ripe sclerotia project from the head of the rye as hard, purplish black, slightly curved structures, up to 3 cm long.
- The sclerotia fall to the ground in autumn, or they may be harvested with the grain
- The sclerotia have a *chilling requirement*, they must be exposed to cold for severa weeks in order to germinate.
- Germinating in spring, the sclerotia put forth numerous small, purplish- pink, drumstick-like fruiting bodies which grow erect but turn towards light.
- Cool, damp weather in late spring and early summer favours ergot germination, helps prolong the flowering period of cereals and grasses, and

increases the probability of ergot infection.

- Each sclerotium produces millions of long, slender, thread-like spores, which are shot out from the asci and become airborne.
- Ergot infection has been linked to *copper deficiency* in cereals or in soils.

> The stalks of the fruit-bodies turning under the influence of light, present different sets of perithecia [flask-shaped fruit-bodies] in succession, from which the spores are discharged. This dispersal takes place at the time the flowers of rye are opening, with the feathery stigmas projecting from the glumes ready to receive the pollen from the flowers, and consequently also in a condition to catch the thread-like spores. The spores, when attached, germinate within twenty-four hours.
>
> They may alight on the stigma, whence they send out long germ-tubes which grow down the outside of the style and encircle the ovary, which they usually penetrate at the base; usually, however, they catch on the joint of stigma and ovary. Having entered the ovary the hyphae grow rapidly, and in six to eight days produce large numbers of ovate conidia or asexual spores [the *Sphacelia* stage] and secrete an abundance of a sticky, yellow, sugary solution, 'honeydew,' which oozes out between the glumes and may drip from the flowers. Conidia will not germinate in honeydew, but when this is diluted with rainwater they do so after ten to twelve hours.
>
> The hyphae gradually destroy the young ovary of the rye, forming a compact, dirty white folded mass of mycelium with irregular cavities. As a result of growth and mutual pressure, a hard pseudo parenchyma is produced, which is the beginning of the sclerotium. The process continues upwards and the formation of conidia and honeydew stops. Meanwhile a very thin crust is formed of closely packed parallel hyphae with violet or almost black walls.
>
> [Ramsbottom 1953]

HISTORY

Clinical manifestations of ergotism were known as early as 350 BC, when we read of "noxious grasses that cause pregnant women to drop the womb and die in childbed."
The cause remained unknown until the 1800s. Severe epidemics occurred in Europe between 900 and 1800, especially in countries were rye was the staple food: Russia, Germany and France.

England has been relatively free from ergotism. A diet rich in dairy products is believed to reduce the effects of ergotism.
In the 16th century ergot-infected plants were regarded as special forms of rye in which the grain had undergone excessive growth. These special forms of rye were called *Secale luxurians,* whereas others considered it to be a distemper of ordinary rye brought about by abnormal conditions.

> The Greeks called the ergot fungus *erysibe,* meaning "rust," this also being an epithet of the Mother Goddess Demeter, and the Sun-god Apollo. Ergot poisoning was called *erispelas* by the Greeks, and *ignis sacer,* meaning "holy fire" in Latin, the title of sacer invariably being one of respect. In the Middle Ages the ergot plague was known as "Saint Anthony's Fire," and the "Fire of the Blessed Virgin," both names that were passed on from the ancients.
> [Shelley 1995]

POSSESSION - HOLY OR HELLISH

Popular names for ergotism include holy fire. Victims were convinced that they would be consumed by flames or holy fire, as a retribution for their sins. Burning in hell. Some inflicted wounds upon themselves to keep the burning sensation away.
Others believed themselves impelled by higher powers, as if under divine influence, conferring the ability to foretell what was to come. They were called "demoniacs, or possessed persons," possessed by either hellish apparitions or holy inspirations.

> In the 1740s, the Age of Rationalism, ergot symptoms became a mark of *holy, not demonic, possession.* Visions, trances, and spasms were read as religious ecstasy. It was a period of religious revival that has been called the Great Awakening. Hundreds, even thousands of people experienced fits, trances, and visions. "The repertoire of symptoms reported in 1741 and 1742 included muscular contractions and spasms; fainting fits followed by a stupor ['lying as if dead'] that may have lasted for many hours; hallucinations, such as being 'out of body,' seeing 'a great light in the night,' visiting Heaven and Hell; sensations of burning heat and terrible cold; trembling and twitching; numbness; difficulty in speaking and speechlessness; weakness; generalized pain; uterine contractions; leg pain,

> lesions, and lameness; slow and painful discharge of urine; nausea, vomiting, and diarrhoea; ravenous appetite during remissions; moods of joy, despair, emptiness; and various violent and demented behaviour." [Matossian 1989]

Ergot caused the symptoms, but cultural factors, varying by time and place, gave these visions shape and colour and conditioned reactions of fear or of religious fervour.

> In Grenoble a group of "convulsionaries" made a stir. In keeping with apocalyptic beliefs of the time, they were convinced that the return of the Jews was imminent, that "Elias has come, that he is getting ready to carry out his mission very soon," and that the "reign of a thousand years of Jesus Christ is at the point of beginning." In Perigord, after the Great Fear, the prophetess Suzette Labrousse began to gain a following. As Clarke Garrett declared, "in 1789 and 1790, it was widely believed in France that religion and revolution would triumph together.
> [Matossian 1989]

ERGOTISM

- Ingestion of cereals infected with ergot results in a condition termed *ergotism.*

This condition has three keynotes:

- Vasoconstriction resulting in dry gangrene.
- Neurological damage resulting in convulsions.
- Hallucinations and mental disorders.

- Gangrenous ergotism is accompanied by nausea and burning pains in the limbs. The extremities may turn black, dry, and become mummified, making it possible for infected limbs to spontaneously break off at the joints. In its most severe form it commenced with general weakness, weariness, and a feeling as of insects creeping over the skin, followed by the extremities becoming cold, white, stiff, benumbed, and finally so insensible that deep incisions were not felt. Then excruciating pains in the limbs supervened, along with fever, and sometimes bleeding from the nose.

> The patient often began by complaining of a general lassitude, vague lumbar pains, or pains in a limb, particularly in the calf. The pulse and

appetite remained at first normal; sometimes there was slight vomiting. The intellect was dulled. In the course of a few weeks the part affected [more often a foot than a hand] became somewhat swollen and inflamed, and was attacked by violent burning pains, as if "un fer ardent traversait le membre affecte." Hence the [name] of fire ...

> A feeling of intense heat alternated with one of icy cold. Not being able to bear the heat in their beds, the sufferer would seek relief in the open air, and then feel so cold that they immersed their limbs in hot water. Gradually the part affected became numbed; the pain sometimes stopped suddenly ... Later the diseased part became black ["like charcoal," as the chronicles have it], often quite suddenly, and all sensation was lost. The gangrenous part shrank, became mummified and dry; the whole body was emaciated and the gangrene gradually spread upwards; sometimes there was putrefaction [moist gangrene],
> [Barger, *Ergot and Ergotism;* cited in Christensen 1975]

• Convulsive ergotism in its most acute form begins suddenly with dimness of sight, giddiness and loss of sensibility; followed soon by dreadful cramps and convulsions of the whole body.
The face turns yellow; there is excessive thirst. Fatal in 24-48 hours.
Milder cases first weakness and heaviness in limbs, plus strange feeling as if insects are crawling over legs, arms and face; then convulsions. Intervals between convulsions: voracious appetite, regular excretions. Recovery with suppurations and skin eruptions, anasarca or diarrhoea. Or fatal amidst prolonged sopor and convulsions.

> It seized upon man with a twitching and kind of numbness in the hands and feet, sometimes on one side, sometimes on the other, and sometimes on both. Hence a Convulsions invaded men on a sudden when they were about their daily employments, and first the fingers and toes were troubled, which Convulsions afterwards came to the arms, knees, shoulders, hips, and indeed the whole body, until the sick would lie down and roll up their bodies round like a Ball, or else stretch out themselves straight at length. Terrible pains accompanied this evil, and great clamours and screeching did the sick make; some vomited when it first took them.
>
> This disease sometimes continued some days or weeks in the limbs, before it seized on the head, although fitting medicines were administered; which if they were neglected, the head was then presently troubled, and some had Epilepsies, after which fits some lay as it were dead six or eight hours, others

were troubled with drowsiness, others with giddiness, which continued till the fourth day, and beyond with some, which either blindness or deafness ensued, or the Palsy.

When the fit left them, men were exceedingly hungry contrary to nature; afterwards for the most part a looseness followed, and in the most, the hands and feet swelled or broke out with swellings foil of waterish humours, but sweat never ensued. The disease was infectious, and the infection would continue in the body being taken once, six, seven, or twelve months.

[Barger, translation of an early Latin account]

- Ergot victims perform strange dances with wild, jerky movements with hopping, leaping and screaming. [Suggesting homeopathic application for hyperactive children.] There is bizarre and sometimes destructive behaviour.
- In both forms the appetite is voracious.

MEDICALLY INDUCED ERGOTISM

At present the epidemic form of chronic ergot poisoning arising from the ingestion of contaminated grain is seldom seen. However, the alkaloids of ergot are extensively employed in therapeutics, and poisoning from their injudicious administration is not rare. Poisoning is usually due to overdosage. There are indications, however, that increased sensitivity to ergot alkaloids may accompany febrile and septic states and disease of the liver. Many cases of ergot poisoning have been reported in patients with puerperal fever. Also, several fatalities from gangrene have occurred in patients with hepatic damage who received ergotamine for relief of the accompanying pruritus. It is assumed that such patients have an unusual vascular sensitivity to ergotamine. Patients having occlusive peripheral vascular disease are extremely susceptible to the vascular complications of ergotamine therapy.

In chronic ergotism, whether due to overdosage or to unusual susceptibility, striking circulatory changes develop. The feet and legs, and somewhat less frequently the hands, become cold, pale, and numb. Muscle pain occurs while walking and later at rest. Arterial pulses in the affected limbs become faint or even disappear. Eventually gangrene develops, beginning usually in the toes but sometimes in the fingers. ... Circulatory disturbances other than those associated with vascular injury have been reported. Anginal pain, tachycardia or bradycardia, and elevation or lowering of the blood

pressure may occur.

In addition to circulatory disturbances, other symptoms of ergot poisoning appear. The most common of these are *headache, nausea, vomiting, diarrhoea,* and *dizziness.* Also, there may be noticeable weakness, formication, itching, and coldness of the skin. Symptoms particularly referable to the CNS are confusion, depression, drowsiness, and, rarely, convulsions, hemiplegia, and tabetic manifestations. In some patients, a fixed miosis may be seen. [Goodman & Gilman 1970]

FOOD-BORNE ERGOTISM

A food mould that causes strange feelings and behaviour is *ergot.* Although law regulates the amount of ergot allowed in foods, this is not enough protection. Ergo toxins, for example LSD, are active in extremely minute [less than a microgram, about one-thousandth of a fly speck] quantities. They are not destroyed by heat and are especially toxic to children. I found traces in cereals, whole grain breads, wines, and honey. It can be detoxified by adding vitamin C but takes longer; about 10 minutes. Detoxify all your *honey* as soon as it arrives in your house. Warm it slighdy and add vitamin C [1/8 teaspoonful per cup]. Stir with wood or plastic.

Ergot toxicity could explain "Jekyll and Hyde" behaviour in children, commonly attributed to "allergies." In fact, the mechanism, inability by the liver to keep up with detoxification, fits well into the "allergic" concept. If your child has undesirable behaviour, try going off the mouldy food suspects for three weeks [cold cereals, nuts and nut butters, store bought breads and baked goods, syrups]. Substitute cooked cereals, bakery breads, potatoes, and honey.

Combining alcohol with ergot is more toxic than either is alone. Alcohol seems to drive the toxin deeper into your tissues. I have found ergot and aflatoxin in beer and wine! Perhaps some of the bizarre behaviour and speech of intoxication is really due to the mould-alcohol combination.

Older children and adults are quite susceptible to ergot too. If bizarre behaviour shows up, such as saying mean and cruel things, expressing unusual, irrational thoughts, feeling emotionless or unreal, try the same diet changes, but put alcoholic beverages, soy sauces and other sauces, and other grain derived foods on the "off" list. Try this diet on yourself if you have a temper or crying spells or frequent colds! Ergot can make you super religious, hearing voices of command or threat. Ergot also causes seizures! [H.R. Clark 1995]

ADVERSE EFFECTS

Side effects from the therapeutic use of Secale in the 19th century include:

- Most commonly: sensation of fullness in the head; pain and cramps in the stomach, colic, nausea, vomiting, painful diarrhoea, salivation.

The diarrhoea is occasionally accompanied by great prostration and mucous discharge.

- Full doses result in "stupefaction," vertigo, headache, tinnitus, and weight and uneasiness of the limbs, with some staggering of gait.
- Toxic amounts result in symptoms similar to those of convulsive ergotism. The convulsive form begins with malaise, general irritation of the whole surface of the body, formication, numbness and coldness of the extremities, often accompanied by cramps and by pains in the head and loins.

Some time later the digestive organs become affected. There is a sense of tightness and oppression about the epigastrium, heartburn, a feeling of lightness in the head, difficulty in hearing, with faintness, twitching of the facial muscles, often *attended by strabismus,* and irregular contractions of the joints. These symptoms are generally accompanied by delirium bordering on mania, with cold sweat. A vesicular eruption on the skin, often accompanied by petechiae, is also frequently observed.

A ravenous desire for food is often associated with convulsive ergotism, [from: Charles D.E Phillips, Materia Medica and Therapeutics, Vegetable Kingdom; London 1886]

ERGOTAMINE

Aside from the use of the application of ergot alkaloids in obstetrics, the major therapeutic use of ergotamine is in the treatment of vascular headaches, such as migraine or cluster. Brand names include Ergate, Cafergot and Migril. Caffeine enhances the action of the ergot alkaloids in the treatment of migraine. Prolonged administration or excessive dosage may cause ergotism or gangrene. The drug should be avoided during pregnancy.

Adverse reactions

Cardiovascular:
Tachycardia; bradycardia; arterial spasm; claudication and *vasoconstriction;* chest pain; Raynaud's syndrome; pallor; angina; *localized oedema; peripheral vascular effects.*

CNS:
Drowsiness; dizziness.

Dermatologic:
Scleroderma.

Alimentary canal:
Nausea; excessive dryness of the mouth; vomiting; diarrhoea; fecal dis- colouration [tarry]; colonic ischemia; pancreatitis.

Genitourinary:
Retroperitoneal fibrosis.

Neuromuscular & skeletal:
Weakness in the legs; myalgia; gangrene; *paraesthesia;* tremor; fascicu- lations

Signs and symptoms of acute overdose include vasospastic effects, colitis, nausea, vomiting, drowsiness, impaired mental function, nystagmus, myalgia, asthenia, hypotension, chest pain, hypertension, bradycardia, vision colour changes [red tinge], unconsciousness, seizures, shock and death.
[Leikin & Paloucek 1998]

DEMETER

The ancient civilization of Greece centred around the religious ceremonies performed annually at Eleusis in Attica. Originally an agrarian cult, the Eleusinian Mysteries were religious rites in honour of the corn goddess Demeter.
Demeter is usually depicted with two attributes: a sheaf of ripe wheat and an opium poppy. The poppy stood for the power of sleep and forgetfulness which possesses humans after death and before rebirth. The wheat represents

> the cultivated Earth, the soil which produces corn and rich harvests of all sorts. As such Demeter symbolizes "a vital phase in evolution, the passage from wild crops to cultivated crops, from the savage to the civilized state." "There were two rituals performed at Eleusis," states Shelley, "the first was the 'Lesser Mystery,' in which the participants were given a libation of wine containing ergot and probably opium, and the 'Greater Mystery,' during which the initiates were given ergot, and experienced a collective vision of the Mother Goddess Demeter. ... Apparendy the Dionysian wine that was utilized in the 'Lesser Mystery' was the species of folly, redeemed by the ritual in the 'Greater Mystery'." The primacy of the narcotic poppy was so displaced with its fungal counterpart, representing the transition from primitive opiate folly to visionary sight. Instead of narcosis, wakeful vision; instead of forgetfulness, birth.

Aristides wrote, "The benefit of the [Eleusinian] festival is not merely the cheerfulness of the moment and the freedom and respite from all previous troubles, but also the possession of happier hopes concerning the end, hopes that our life hereafter will be the better, and that we shall not lie in darkness and filth - the fate that is believed to await the uninitiated."[1]

But Demeter had also more sinister manifestations. Like all the oldest forms of the Earth Goddess, she appeared as Virgin, Mother, and Crone, or Creator, Preserver, and Destroyer. This trinity, which underlies the cycle of all life-forms, implies sexuality.

> Early Christians were much opposed to the Eleusinian rites because of their overt sexuality, even though their goal was "regeneration and forgiveness of sins." Asterius said, "Is not Eleusis the scene of descent into the darkness, and of the solemn acts of intercourse between the hierophant and the priestess, alone together? Are not the torches extinguished, and does not the large, the numberless assembly of common people believe that their salvation lies in that which is being done by the two in the darkness?
> [Walker]

The deposed pagan deities so became typically demonic: ergot was known as 'Mother-corn,' and the Goddess was blamed for the infested kernels, which were her wolf children.

1 cited in: Barbara G. Walker, The Womens Encyclopedia of Myths and Secrets; Edison 1996.

WOLVES

There are numerous analogies in the traditional folklore of Western Europe to the corn-goddess Demeter. [It should be noted that corn in the European tradition - Korn in German, koren in Dutch - refers to small grains, (wheat) whereas North Americans know it as maize.] In spring, when the wind sets the corn in wave-like motion, German peasants say that 'the corn-mother is running over the field' or is 'going through the corn'. Sitting in the grain and making it grow, the corn-mother should be left undisturbed.

Children were warned against straying in the corn because the corn-mother would catch them. When the corn is harvested the corn-mother is believed to be present in the last corn, which is left standing on the field. With the cutting of this last handful she is caught, or killed, or driven away by threshing the corn. Mother and offspring had to be separated so that the former would the next year return to produce anew. [This reflects the ancient myth of Demeter and her daughter Persephone, who was snatched by Hades, the god of the Underworld.

Persephone had to spend four months of every year, when winter gripped the land, with Hades. On her return in spring her happy mother made the earth bring forth rich harvests again.] Apart from healthy offspring, the wholesome grain, the Kornmutter [corn-mother] or Roggenmutter [ryemother] of German/Dutch rural folklore, however, could bring forth dark offspring named Kornmutterkorn or, in Dutch, korenmoederkoorn, later shortened to Mutterkorn or moederkoorn ['mother of corn']. These latter were, and still are, the common names for the ergot fungus, and denoted her illicit or bastard children, alternatively known as Roggenwolf ['rye-wolf'], Wolf, or Wolfszahn ['wolf-tooth']. Until recently, couples living together without being lawfully married were contemptuously called *wolf couples* in Finland. The 'bastards' born out of such relationships were openly exposed and humiliated. Born to be wild. Shame and scandal in the family.

The Roggenwolf, living in grain fields, was believed to ambush peasants, strangling them. Sir James Frazer, in *The Golden Bough,* gives many examples of French, German, and Slavonic traditions where the corn-spirit was conceived as a wolf or a dog. It was thought that the Rye-wolf rushed over the field or that the mad Dog was in the corn. These sinister creatures could come and eat or carry off children. [Again, a reflection of the myth of Persephone and Hades.] Cutting the last corn, in various parts of Europe, was considered 'to kill the Dog' or 'to catch the Wolf'.

"In various parts of Mecklenburg, where the belief in the Corn-wolf is

particularly prevalent, every one fears to cut the last corn, because they say the Wolf is sitting in it. ... Both among the reapers and the binders there is a competition not to be the last to finish. And in Germany generally it appears to be a common saying that 'the Wolf sits in the last sheaf.' ... In Mecklenburg the last bunch of standing corn is itself commonly called the Wolf, and the man who reaps it 'has the Wolf'.

The reaper of the last corn is himself called Wolf or the Rye-wolf, if the crop is rye, and in many parts of Mecklenburg he has to support the character by pretending to bite the other harvesters or by howling like a wolf. Of the woman who binds the last sheaf they say, 'The Wolf is biting her' ... and she has to bear the name [Wolf] for a whole year. ... In the island of Riigen not only is the woman who binds the last sheaf called Wolf, but also when she comes home she bites the lady of the house and the stewardess, for which she receives a large piece of meat. Yet nobody likes to be the Wolf."

The Wolf could hide amongst the cut corn in the granary, but would be driven out of the last bundle by the strokes of the flail. Yet the Wolf returned after the winter to renew his activity as corn-spirit in the spring. Although the corn-spirit in other parts of Europe may have assumed such forms as a cock, hare, cat, cow, horse, or pig, the link between corn [rye] and wolf or dog is particularly interesting.

It has been suggested that there is an etymological links between ergot and 'warg', 'werga' or 'wearg', Old English words for wolf but also for an outlaw who, for committing an unredeemable crime, is cast out from the community and doomed to wander until he dies. *[Varg*is Swedish for wolf]

Warg is derived from Indo-European wergh, to strangle, a connection that still can be detected in the German and Dutch words for strangling: wiirgen or wurgen.

In Old English and Old Norse, the gallows is known as the 'warg-tree'. Diseases of the throat accompanied by difficulties in breathing and swallowing, particularly quinsy, bear the name *cynanche,* which derives from *kynos,* a dog, and *anchein,* to throttle. The Roggenwolf of German folklore was believed to ambush and strangle peasants and to 17th-century English physicians ergotism was known by the name 'suffocation of the mother'. The convulsive form of ergotism was termed St. Vitus' dance. Now diagnosed as a streptococcal inflammation resulting in chorea minor, St. Vitus' dance was believed in old times to be produced by dogs, for one prayed to St. Vitus to 'keep the dogs chained.' *[compare* Lyssin.]

In Indo-European mythologies dogs guard the entrance to the Underworld [hellhounds] and must be passed on one's travel to the realm of the dead.

DEMETER: NURTURER AND MOTHER

• Insight into the Demeter archetype provides valuable clues for a better understanding of the drug picture of Secale. This is not to suggest that the Demeter archetype and the Secale picture are identical or that Secale is the only remedy having Demeter elements. On the contrary, Demeter characteristics can be recognized in various other remedies, such as Calcarea carbonica, Pulsatilla, Opium, Sepia, to name a few. Yet, in a remedy with such a marked predilection for the womb as Secale has, its corresponding correlations will undoubtedly be present as well: maternity, protection, nurturing, fertility, sexuality. "All the natural alkaloids of ergot markedly increase the motor activity of the uterus."

The signature of Claviceps can be seen in a similar vein. The fungus invades the ovaries of its host [or victim?] and replaces the 'legitimate' grains. A major effect of ergot intoxication is abortion due to uterine spasms. From the 16th century ergot has been used to reduce haemorrhage following childbirth as well as a drug to induce abortions. It was used by midwives long before it was recognized by the medical profession. Initially it was called pulvis ad partum [powder for parturition], later pulvis ad mortem [death powder] because it often led to the death of the mother or the foetus. In 1824, Hosack wrote that the number of stillborn children had increased so greatly since the introduction of ergot that the Medical Society of New York instituted an inquiry.

Interestingly, the clinical use of the ergot compound bromocriptine includes the prevention of lactation as well as the suppression of established lactation, apparently without causing any additional discomfort. Bromocriptine suppresses the release of prolactin, a hormone which, according to one hypothesis, has the biological function of *parental* hormone. Certain broodiness and nest-building activity can be induced in birds by prolactin injections, and equivalent parental behaviour can be induced in mice and rabbits.

• The key components of the Demeter archetype are expounded by Jean Shinoda Bolen in her book *Goddesses in Everywoman·*.

- Demeter is the maternal archetype. She represents maternal instinct fulfilled through pregnancy or through providing physical, psychological, or spiritual nourishment to others.
- The mother archetype motivates women to nurture others, to be generous

and giving, and to find satisfaction as caretakers and providers.

- Feeding others is another satisfaction for a Demeter woman. She finds nursing her own child tremendously satisfying. It gives her pleasure to provide ample meals for family and guests.
- Maternal persistence is another Demeter attribute. Such mothers refuse to give up when the welfare of their children is involved.
- Asked what they were most proud of, all these [Demeter] women replied, "My children." None mentioned any other accomplishment of their own. When they lost their maternal roles, life lost its meaning.
- The destructive aspect of Demeter is expressed by withholding what another person needs. Failure to thrive results when a mother withholds emotional and physical contact from her infant, as well as needed nutrition.
- A Demeter woman's maternal qualities and her difficulties in saying no make her vulnerable to being used [parasitized, exploited] by a sociopath, another type of man often found in relationships with Demeter women. He magnifies his needs - and that neediness invites a generous Demeter response.
- The Demeter woman is a "huggy" woman rather than a sexy woman. Many Demeter women have a puritanical attitude toward sex. For them, sex is for procreation, not for pleasure.
- Demeter women may become overcontrolling and overprotective because of a sense of living in an unsafe world.
- Tendency to foster dependency or to allow her children to take advantage.
- Fatigue, headaches, menstrual cramps, ulcer symptoms, high blood pressure, and back pains are common in Demeter women who have trouble saying no or expressing anger when they are overworked and overloaded with too many responsibilities or children.

DANGEROUS WORLD

Matossian mentions as an example of the mass hysteria evoked by ergot intoxication what is known as la Grande Peur [the Great Fear], a series of startling events in France in late July 1789, when thousands of peasants, panic-stricken, fled into the woods after rumours about villains coming to seize the newly harvested rye crop, as well as to rape and kill women and burn down whole villages. Numerous peasants reportedly Tost their heads' [became manic or insane] and local physicians blamed this on 'bad flour' [rather than on the Revolution that has just started].

Panic is a common concomitant of the psychic disturbances associated with ergotism. Victims of ergotism "believe themselves to be drowning, or they see a fire and fear to be burned alive. Again others believe that someone is attacking them in order to butcher or strangle them. Some see robbers attacking their homes and others see devils, demanding they give up their faith."
In addition, there may be feelings of being pinched, choked, bitten, or suffocated.
This allows the conclusion that Secale patients may perceive the world as an unsafe place for themselves and/or for their children.

KENT'S PICTURE OF SECALE

Comparing the Demeter concept with Kent's Secale picture provides a setting for the scattered symptomatology:

= Burning is a feature of this remedy; the skin burns; the extremities burn, sensation of burning when the parts feel cold to the touch and really are cold, a sensation of heat with coldness. [The burning sensation has its parallel in fervour, burning desire or emotion.]
= Some women are so insane that though they will die they will get rid of their offspring. On all hands women say, "I have had no health since I aborted."
<·> The withered scrawny person with tendency to ulcerations, unhealthy skin and *aggravation from heat.*
= Establishes sterility; so weak is the uterus that it can never hold the foetus, hence the value in sterility and repeated abortions.
= Dwindling of the mammae. Absence of milk after confinement.
= Thin, scrawny children with shrivelled skin, spasmodic twitchings, sudden cries, feverishness.

PERILS OF PROCREATION

=» The French homeopathic paediatrician Jacques Lamothe, of Toulouse, sees the core of the problem of Secale as residing in procreation, in reproduction. "There is confusion between procreation and parasitism: procreation is perceived as a subjection or a danger; procreation involves in fact the risk of being subjected [to each other] and the risk of dying [also for both parties]. In procreation reside all the inherent risks involved in birth, survival, sharing,

sacrifice, serving, dependence and independence, which invariably face both mother and child.

From the point of view of the child, Secale presents symptoms of refusal of parents: refusal of dependency, "parasitical" behaviour, troublemaking and destructive tendencies towards the family, such as denying those who have nourished him.
Being born includes the risk of dying in a dangerous battle [sometimes fought against the uterus of her who has conceived him], being raised, the end of freedom.
From the point of view of the parent [s], Secale presents physical symptoms regarding refusal to procreate [abortions, difficult deliveries with the risk of suffocating the child in the uterus] - as if the foetus would be perceived as a parasite -, refusal to nurse [agalactia] and to raise [aversion to children].
To give birth involves the risk of dying because of one's offspring, and to raise a child involves the risk of the death of freedom.

Secale nature:
rejecting
self-willed, stubborn,
nervous, agitated,
provocative,
capricious
destructive
ridiculing
-the odd one out / ugly duckling! outsider
refuses food and affection.

Respiratory difficulties

Lamothe characterizes the Secale child as having a difficult character, "rejective, *stubborn* [as a mule], self-willed, nervous, agitated, choleric, provocative, capricious, destructive [esp. in the family], ridiculing the parents, hitting them or spitting in their faces." It sometimes concerns a "rejected child that is different from its siblings ['the ugly duckling']" or it can be a child "desperately wished for," with the mother having a history of in vitro fertilization and a difficult pregnancy.

Benjamin is 3 years and 2 months old and presents with recurrent respiratory infections [rhinitis, asthmatic bronchitis] accompanied by high fever, delirium and chills, and distressed breathing. The complaints began when he started school at 2 years and 3 months of age. He has been anorectic from the moment he was born.
Striking features: aversion to contact with the breast when he was a baby, aversion to milk very early [he has been very difficult to feed]; later greatly increased appetite with emaciation, desire for olives, fever with chills and delirium [he saw frightening creatures on the walls], insensitivity to pain.

What is striking mentally is the ugly character of the child, despite his being so much welcomed and cherished by his attentive parents. He was conceived by fertilization in vitro [with the father's sperm], the pregnancy was very difficult and the mother got a lymphoma when he was 18 months old, which was cured by chemotherapy.

Benjamin is active, precocious, very choleric and the most obstinate child one can imagine. He is not affectionate and almost from the beginning has refused to be caressed.

Parasitic on grasses, mainly rye. Replaces ovaries of host. Must be exposed to cold in order to germinate. Copper deficiency. Holy or hellish visionary/ convulsionary. Cardiovascular and/or neurological effects. Demeter. Bastard. Perils of procreation.

After failure of obvious remedies such as Sulphur and Antimonium crudum, Secale one dose of 200K relieves him for five months of bronchitis, after which a IM was needed due to a tracheal cough.

Jean-Baptiste, 13 months old, has a permanent naso-bronchial obstruction with asthma since the age of 3 months, without any allergies or other causative factors running in the family. Failure of remedies apparently indicated [Medorrhinum, Calcarea carbonica, Sulphur, Spongia], but immediate and total cure since two years with a single dose of Secale 200K, prescribed on three symptoms:

«· Suppurating seborrhoeic cradle cap', at 2 months, with offensive smell.
=» Enormous appetite with emaciation.
= Subconscious rejection by the mother.

Although seemingly the mother loves and cherishes the child, she nevertheless has problems accepting him. In fact, during the pregnancy, she did not want to know the sex of her child. On the day of the ultrasound, however, she couldn't resist glancing at the screen and she then discovered that it was a boy. She had for a long time anticipated finding out at one time about the sex of the child. She didn't tell the nurse who conducted the ultrasound because she had already told her that she didn't want to know the sex of the child, nor did she tell anybody else. And so she kept brooding about her discovery, which was a big disappointment since secretly she had wished for a girl.

The whole thing came as a shock for her; she felt herself shrivel and her entire left side became blocked. She also experienced a strong thoracic pain, that made her bend forwards and prevented her from breathing properly in the last trimester of the pregnancy. She blocked herself from breathing even more from the fear "that the baby would feel it!"

When Jean-Baptiste is 13 months old, she cries when confiding that she

has still not recovered from the shock of not getting a girl. [Jean-Baptiste is her second son.] For her, a girl would have been marvellous, because since her childhood she has felt an extraordinary bond with her mother and grandmother. She thinks that these feminine family bonds are the most, even the only, “lasting and agreeable” relationships.

[Jacques Lamothe; article available at: http://www.homeoint.org/dynamis/collioureOl/secale.htm; translation: Catarina Astrom]

ERGOTINUM **Ergot.**

- Total extract of dried Claviceps purpurea.

KEYS

- May be considered when Secale fails to work.
- Congestive headaches of phlegmatic, lymphatic women during climaxis.
- Faintness.
- Slowing-down of mental processes.

MATERIA MEDICA

= Drug picture based on clinical observations.

"Beginning arteriosclerosis progressing rather rapidly. Increased blood pressure: 2x trit. Oedema, gangrene and purpura haemorrhagica; when Secale, though indicated, fails." [Boericke]

"Its homeopathic uses are in the main identical with those of *Secale,* but *Ergotin* will sometimes succeed when *Secale* fails." [Clarke]

To illustrate this point Clarke cites the following case:
"Koeck, of Munich, has recorded a case in point *[H. Monatsblatter,* Sept., 1898]. *Secale,* like *Phos.,* has "wide-open anus" in its symptomatology. Koeck's patient had suffered from diarrhoea since the Franco-German war, and latterly had lost all power of retention. It was for this that the doctor was consulted. The rectum had lost all sensation, so that the patient had no warning and was never clean. The odour may be imagined. Old-school treatment had failed to relieve him. He was about to be pensioned by his employers, and had thoughts of suicide. *Secale* 3x ameliorated slightly; the 2x had the same result. 'Remembering Kafka's advice to use the alkaloid when the indicated drug did not seem to act, he prescribed *Ergotin* 2x.' After taking this for four days the patient regained control."

Headache

== "In accordance with its pathological effects, and selecting it by its secondary symptoms, I have used *Ergotin* very successfully in very severe *congestive headaches,* when they occur in persons of lax fibre, large, phlegmatic, lymphatic individuals, whose blood vessels are doubtless relaxed and easily distended, almost to bursting, whenever the circulation is abnormally

directed. Such *headaches* usually occur at the *climacteric period* in women, and in old drunkards of both sexes. The pain seems to rise up into the head from the back of the neck, the occiput first suffers, then it extends all over the head, and the agony and distress more than the acute pain, becomes almost unbearable. The face is rather pale and cool, than suffused, the extremities cold and livid. [This is not the case when Belladonna or the Bromides are indicated, for the face is hot and red, with throbbing temples.] The congestion is more internal - central - than general or peripheral. Sometimes the head is drawn backwards by almost continuous contractions." [Hale]

Menstruation

= "Kafka gives one case of *protracted menstruation;* one of *haemorrhage after delivery;* one of *climacteric menorrhagia,* and one of *profuse menstruation.* In all these cases this characteristic symptom was present: *little or no pain, the blood in dark clots, or dark fluid, aggravated by any motion or mental excitement.* In all, Secale 1st was tried, ineffectually, while Ergotin 1st acted promptly." [Hale]

CLINICAL PICTURE

== "The result of a clinical proving lasting for 26 years, carried out by Fouche, but not a Hahnemannian proving." [Julian]

Mind

«· Short loss of consciousness.
Attacks of faintness.
&L Empty feeling in head.
& Blurred vision [cloudy].
& Buzzing in ears.
& Vertigo.
& Nausea, sometimes vomiting.

Advice from Kafka: When the indicated drug does not seem to work, use the alkaloid.

Anxious, hyperemotional state.
<= *Chronic mental depression.*
= Slowing-down of *mental processes,* semi-insensivity to surroundings.

Menstruation

== Before menses: depressive condition; headache; swelling of breasts and abdomen.
«· Menses painful; blood red, without clots.

Locals

= Alopecia; circumscribed, round patches.
= Visual complaints with cloudy vision, black or luminous spots before the eyes.
= Vulvo-vaginal pruritus, congestion, redness, dryness of the mucous membranes.
« Urticaria.
= Angioneurotic oedema.
[from: O.A. Julian, Materia Medica of New Homoeopathic Remedies]

May be considered when Secale
fails to work.
Congestive headaches of
phlegmatic, lymphatic women
during climaxis.
Faintness.
Slowing-down of mental
processes.

HYDERGINUM **Hyderg.**

- Semisynthetic derivative of three ergotoxine alkaloids.

KEYS
- Semisynthetic derivative of three ergotoxine alkaloids.
- Cognitive impairment.
- Amnesia.
- Dementia-like state.
- Hostile, uncooperative and unsociable.
- Languid and drained.

DEMENTIA

- A semisynthetic derivative of three ergotoxine alkaloids known as *Hydergine* has proved valuable in Europe in the treatment of impaired mental function in the elderly. The drug was originally developed to improve blood flow and oxygen supply in the brains of stroke victims and people with epilepsy. The use of the drug as a vasodilator and hypotensive agent was never widespread in North America. Now classified a *metabolic enhancer,* it has been approved by the FDA for treating dementia.

Hydergine has repeatedly demonstrated effectiveness in the treatment of many different conditions, from age-associated memory impairment to the prevention of oxygen-deprivation damage to the brains of automobile accident victims. Hydergine was the first drug to show efficacy against Alzheimer's disease. Hydergine's efficacy in treating dementias is as well- established as almost any other drug used for psychiatric disorders. As of 10 years ago, more than 20 double-blind placebo-controlled trials had been conducted to test Hydergine with senile dementias. All trials noted statistically significant improvements in behavourial and psychological parameters. Numerous favourable studies have been published since then. One recent study, however, reported no improvement in 39 Alzheimer's patients who were treated with 1 mg Hydergine three times per day for six months. These negative results may be due to the disease having progressed beyond Hydergine's ability to help, or perhaps because an inadequate dosage of Hydergine was used. In an earlier study of patients with multi-infarct dementias or mental disturbances following strokes, Dr.

Yoshokawa and colleagues demonstrated that a 6 mg per day dose was far superior to the standard 3 mg per day dose. The literature suggests that Hydergine treatment be started as early as possible in Alzheimer's patients. ... In a study in Japan, Yoshokawa and colleagues conducted a large doubleblind study of Hydergine in 550 patients. They found that "almost half of the patients in the 6 mg group [48.9%] showed a moderate to marked improvement, compared with only 17.9% in the 3 mg group." Furthermore, they noted that "the superiority of a higher Hydergine was particularly pronounced in patients with heavy-headedness, sleep disturbances of various kinds, problems of concentration, loss of vigour, memory disturbances, and giddiness."

[W. Dean, J. Morgenthaler & S.W. Fowkes, *Smart Drugs II;* Smart Publications, Petaluma, 1993]

It so improves oxygenation of the brain that it is widely used in Europe as an adjunct to surgery, to give surgeons more time in the case of cardiac arrest, to resuscitate the patient before brain damage from lack of oxygen supervenes. *Hydergine* has also shown valuable stimulant effects even in healthy young adults, and has been shown to improve mental processing and performance in 9 12 mg daily doses, making it one of the most sought-after 'smart drugs'.
[Ott 1996]

I first tried Hydergine six years ago with some fascinating results. During a visit to see my Dad at Christmas, he and I started taking 9 mg per day of Hydergine in the hope it would help to improve our long-term memory. The results were apparent to us both within two days. He was in his forties and could remember events from when he was in his twenties. They were as clear in his mind as if they happened yesterday. ... I was in my early twenties and my memories went back to the childhood years. A unique opportunity had been presented to us to sit down and share in the joys that our life had brought us. What a gift!
[cited in: Weil & Rosen 1998]

	Hydergine	Placebo
• Hostility	86%	41%
• Dizziness	77%	58%
• Bothersomeness	69%	58%
• Irritability	67%	48%
• Confusion	64%	28%
• Uncooperativeness	64%	40%
• Mood - depression	61%	32%
• Unsociability	60%	30%
• Impaired recent memory	60%	40%
• Impaired mental alertness	56%	40%
• Indifference to surroundings	54%	44%
• Anorexia	54%	23%
• Anxiety	54%	54%
• Impaired self-care	50%	30%
• Impaired motivation and initiative	48%	36%
• Emotional lability	44%	34%
• Fatigue	40%	25%

[from: W. Dean & J. Morgenthaler, *Smart Drugs dr Nutrients;* B & J Publications, Santa Cruz, 1990]

COGNITIVE IMPAIRMENT

• Subjects [average age of 77] with moderately impaired behavioural and cognitive functioning were given 3mg per day of Hydergine or placebo for 12 weeks. The overview below shows the percentages of symptoms that improved on Hydergine [first figure] compared to placebo [second figure].

• Dean and Morgenthaler record as precautions for the use of Hydergine as a smart drug to "improve your memory and increase your intelligence": "If too large a dose is used when first taking Hydergine, it may cause slight nausea, gastric disturbance, or headache. Overall, Hydergine does not produce any serious side effects. It is non-toxic even at very large doses and it is contraindicated only for individuals who have chronic or acute psychosis, or who are allergic to it. Overdosage of Hydergine may, paradoxically cause an amnesic effect."

CONCEPT

• No homeopathic provings have been conducted with Hydergine. The drug represents certain specific aspects of the Secale-picture, with confusion and "stupefaction" as the principal themes.
Many symptoms related to these themes can be found under *Secale* in Alien's Encyclopaedia, including:

- Indifference to everything.
- Disinclination for work.
- Disinclination to answer.
- Great weakness of thought.
- Thought and speech difficult.
- Intellectual languor.
- Weakness of memory.
- Memory lost, forgot what he just said.
- All the senses benumbed.
- Stupefaction.
- The only expression he gave utterance to was a stupid kind of "I am hungry."

• Several provers experienced similar sensations during the *Secale* proving conducted by Diez in 1993. One prover felt constandy as if she had forgotten something and another felt "as dull and stupid as an Alzheimer patient." Cognition related symptoms can be regarded as being part of the Secale picture or can be branched off into the distinct Hyderginum symptom picture. Although provings and clinical cases are needed to bring out modalities and other individual indications, a provisional concept would include a general Secale picture with a focus on cognitive functions and memory. The latter will have the main emphasis since Hydergine can both cause and improve amnesia. In addition, we may expect this to be accompanied by hostility, confusion, uncooperativeness, depression, unsociability, fatigue, gastrointestinal disturbances including anorexia, and headache or other circulatory manifestations. Blunted affect and indifference will predominate rather than anxiety, since Hydergine experimentally does not exert any more influence on anxiety than placebo does.

• Personal accounts from Hydergine users concerning the positive and/or

adverse effects of the smart drug enable us to get a more complete idea of its potential. Here are some comments about its effects:

Semisynthetic derivative of three ergotoxine alkaloids.
Cognitive impairment.
Amnesia.
Dementia-like state.
Hostile, uncooperative and unsociable.
Languid and drained.

- Increased energy, concentration and alertness. No improvement in memory. Side effects were a caffeine-like burn-out occasionally.
- Hydergine tends "to leave me drained and tired after about a week of continuous use.
- Hydergine "makes my dreams more colourful and strange, sometimes gruesome, but I don't seem to mind at the time."
- "I found one result [of Hydergine] to be improved vision at night, which was unexpected. Mostly, I experience increased alertness and ability to keep track of details."

[from: Smart Drugs II]

- Lysergic acid diethylamide. LSD-25.

KEYS

- Synthetic derivative of the ergot alkaloid lysergic acid.
- Flashbacks and release [reliving] of repressed traumatic experiences.
- Transformation and disintegration of accustomed world view.
- Daily reality in a new light.
- Sense of mystical experience. Focus on the transcendental and divine.
- Visual illusions or visionary perceptions.
- Enhanced colour perception.
- Alteration of body image.
- Childlike feeling.

ORIGIN

- Based on the naturally occurring tetracyclic alkaloid *lysergic acid,* ergot alkaloids are a source of *lysergic acid diethylamide,* commonly known as LSD. Why the number "25" follows the name is answered by Albert Hofmann in his *LSD, My Problem Child:* "In 1938, I produced the twenty fifth substance in a series of lysergic acid derivatives: lysergic acid diethylamide, abbreviated LSD-25 for laboratory usage."

> Time and again I hear or read that LSD was discovered by accident. This is only partly true. LSD came into being within a systematic research pro gram, and the "accident" did not occur until much later: when LSD was already five years old, I happened to experience its unforeseeable effects in my own body - or rather, in my own mind.
> ... I had planned the synthesis of this compound with the intention of obtaining a circulatory and respiratory stimulant [an analeptic]. Such stimulating properties could be expected for lysergic acid diethylamide, because it shows similarity in chemical structure to the analeptic already known at that time, namely nicotinic acid diethylamide [Coramine]. During the testing of LSD-25 in the pharmacological department of Sandoz, whose director at the time was Professor Ernst Rothlin, a strong effect on the uterus was established. It amounted to some 70 percent of the activity of ergobasine.

The research report also noted, in passing, that the experimental animals became restless during the narcosis. The new substance, however, aroused no special interest in our pharmacologists and physicians; testing was therefore discontinued. For the next five years, nothing more was heard of the substance LSD-25 And yet I could not forget the relatively
uninteresting LSD-25. A peculiar presentiment - the feeling that this substance could possess properties other than those established in the first investigations - induced me, five years after the first synthesis, to produce LSD-25 once again so that a sample could be given to the pharmacological department for further tests. This was quite unusual; experimental substances, as a rule, were definitely stricken from the research program if once found to be lacking in pharmacological interest.
[After a remarkable experience] ... If LSD-25 had indeed been the cause of this bizarre experience, then it must be a substance of extraordinary potency. There seemed to be only one way of getting to the bottom of this. I decided on a self-experiment. ... Exercising extreme caution, I began the planned series of experiments with the smallest quantity that could be expected to produce some effect, considering the activity of the ergot alkaloids known at the time.
[Forty minutes after 0.25 mg of lysergic acid diethylamide tartrate, taken diluted with about lOcc water] ... Beginning dizziness, feeling of anxiety, visual distortions, symptoms of paralysis, desire to laugh. [Followed by:] The dizziness and sensation of fainting became so strong at times that I could no longer hold myself erect, and had to lie down on the sofa. My surroundings had now transformed themselves in more terrifying ways. Everything in the room spun around, and the familiar objects and pieces of furniture assumed grotesque, threatening forms. They were in continuous motion, animated, as if driven by an inner restlessness. The lady next door, whom I scarcely recognized, brought me milk - in the course of the evening I drank more than two litres. She was no longer Mrs. R., but rather a malevolent, insidious witch with a coloured mask.
Even worse than these demonic transformations of the outer world, were the alterations that I perceived in myself, in my inner being. Every exertion of my will, every attempt to put an end to the disintegration of the outer world and the dissolution of my ego, seemed to be wasted effort. A demon had invaded me, had taken possession of my body, mind, and soul. I jumped up and screamed, trying to free myself from him, but then sank down again and lay helpless on the sofa. The substance, with which I had wanted to experiment, had vanquished me. It was the demon that scornfully

triumphed over my will. I was seized by the dreadful fear of going insane. I was taken to another world, another place, another time.

> My body seemed to be without sensation, lifeless, strange. Was I dying? Was this the transition? At times I believed myself to be outside my body, and then perceived clearly, as an outside observer, the complete tragedy of my situation. I had not even taken leave of my family [my wife, with our three children had travelled that day to visit her parents, in Lucerne]. Would they ever understand that I had not experimented thoughtlessly, irresponsibly, but rather with the utmost caution, and that such a result was in no way foreseeable?
>
> My fear and despair intensified, not only because a young family should lose its father, but also because I dreaded leaving my chemical research work, which meant so much to me, unfinished in the midst of fruitful, promising development. Another reflection took shape, an idea full of bitter irony: if I was now forced to leave this world prematurely, it was because of this lysergic acid diethylamide that I myself had brought forth into the world.
>
> [Albert Hofmann, *LSD: My Problem Child;* 1980]

FIRST SELF-EXPERIMENT BY A PSYCHIATRIST

• Soon after Hofmann's self-experiment, LSD was tried on animals. After this the first systematic investigation of the substance was carried out on human beings, at the psychiatric clinic of the University of Zurich. Werner A. Stoll, M.D., who led this research, published his results in 1947 in the Schweizer Archiv fur Neurologic und Psychiatric, under the title "Lysergsaure-diathylamid, ein Phantastikum aus der Mutterkorngruppe" [Lysergic acid diethylamide, a phantasticum from the ergot group]. Stoll's experiments detail "many characteristic features of LSD inebriation," according to Albert Hofmann, especially those that were carried out in a darkened room. After the initial euphoria had vanished, depression set in:

> Whereas during the first dark experiment, the hallucinations had alternated with great rapidity in bright and luminous colours, now blue, violet, and dark green prevailed. The movement of larger images was slower, milder, quieter, although even these were composed of finely raining "elemental dots," which streamed and whirled about quickly. During the first dark experiment, the commotion had frequently intruded upon me; now it

> often led distinctly away from me into the centre of the picture, where a sucking mouth appeared. I saw grottoes with fantastic erosions and stalactites, reminding me of the child's book Im Wunderreiche des Bergkonigs [In the wondrous realm of the mountain king]. Serene systems of arches rose up. On the right-hand side, a row of shed roofs suddenly appeared; I thought of an evening ride homeward during military service.

Significandy it involved a homeward ride: there was no longer anything like departure or love of adventure. I felt protected, enveloped by motherliness, was in peace. The hallucinations were no longer exciting, but instead mild and attenuated. Somewhat later I had the feeling of possessing the same motherly strength. I perceived an inclination, a desire to help, and behaved in an exaggeratedly sentimental and trashy manner, where medical ethics are concerned. I realized this and was able to stop.

But the depressed state of mind remained. I tried again and again to see bright and joyful images. But to no avail; only dark blue and green patterns emerged. I longed to imagine bright fire as in the first dark experiment. And I did see fires; however, they were sacrificial fires on the gloomy battlement of a citadel on a remote, autumnal heath.

Once I managed to behold a bright ascending multitude of sparks, but at half-altitude it transformed itself into a group of silendy moving spots from a peacock's tail. During the experiment I was very impressed that my state of mind and the type of hallucinations harmonized so consistently and uninterruptedly.

During the second dark experiment I observed that random noises, and also noises intentionally produced by the supervisor of the experiment, provoked simultaneous changes in the optical impressions [synesthaesia]. In the same manner, pressure on the eyeball produced alterations of visual perceptions.

... After the second dark experiment I felt benumbed and physically unwell. I perspired, was exhausted. ... I was depressed and thought with interest of the possibility of suicide. With some terror I apprehended that such thoughts were remarkably familiar to me. It seemed singularly self- evident that a depressed person commits suicide.....

... The next day I was careless in my thinking and conduct, had great trouble concentrating, was apathetic. . . . The casual, slightly dream-like condition persisted into the afternoon. I had great trouble reporting in any organized way on a simple problem. I felt a growing general weariness, an increasing awareness that I had now returned to everyday reality.

> The second day after the experiment brought an irresolute state.... Mild, but distinct depression was experienced during the following week, a feeling which of course could be related only indirectly to LSD.
> [cited in: Albert Hofmann, *LSD: My Problem Child*\

THERAPY

• Over the decade following Hofmann's discovery of the extraordinary potency of LSD, the drug was used as an adjunct to psychotherapy in the treatment of character neuroses and sexual perversions, in the treatment of chronic alcoholism, autism in children, and in terminal illness. Because its value in these conditions could not be established and it furthermore showed a distinctive psychologically addictive potential, its therapeutic use was later largely abandoned. Although convinced of LSD's therapeutic value, Gustav Schenk's early 1950s prediction proved to be accurate: "It will certainly not be long before there are a number of lysergic acid diethylamide addicts." The drug was used in the postwar years in the Netherlands in the treatment of concentration-camp survivors. The often extensive residual damage to these survivors commonly included anxiety, insomnia, headaches, irritability, depression, nightmares, impaired sexual potency, and functional diarrhoea. The LSD-therapy was based on the concept of "flashbacks", in the hope that reliving the psychological horrors in a therapeutical setting might help solve the scars.
The drug was marketed experimentally by Sandoz under the trade name Delysid, accompanied by the following indications: "Analytical psychotherapy, to elicit release of repressed material and provide mental relaxation, particularly in anxiety states and obsessional neuroses. ... Experimental studies on the nature of psychoses: By taking Delysid himself, the psychiatrist is able to gain an insight into the world of ideas and sensations of mental patients. Delysid can also be used to induce model psychoses of short duration in normal subjects, thus facilitating studies on the pathogenesis of mental disease."
Writing in the early 1950s, the German toxicologist Gustav Schenk found LSD "a narcotic of a very strange kind."

> The person intoxicated with it sees the world as he has never seen it before. The objects he perceives acquire huge dimensions; for example, his hand holding a glass becomes enormous, and the glass itself assumes gigantic proportions. His self-confidence increases inordinately and all the spaces

around him become immeasurably enlarged. Later, he loses all sense of his own personality; his contact with things disappears, and not a trace remains of his initial sensation of enhanced self-assurance.

Lysergic acid diethylamide has proved to be of immense therapeutic value in the field of psychiatry. It possesses the startling property of wiping out inhibitions and releasing the most profoundly buried memories. Injected with minute quantities of LSD, patients remain conscious but undergo a type of "flashback" experience in which they relive and recount very early scenes from childhood. Some patients have even relived the details of their own births, visualizing and giving circumstantial accounts of how their limbs were shrinking to the size of a child's, as they went back though their lives under the influence of the drug. By recording the unconscious memories thus brought to light, psychiatrists are able to get rapidly and comparatively easily to the source of mental illness.

[Schenk 1955]

MAIN THERAPEUTIC APPLICATIONS

• The major psychic effects of the use of LSD in analytical psychotherapy are summarized by Albert Hofmann thus:

- Deep-seated transformation and disintegration of the accustomed world view, accompanied by "a loosening or even suspension of the I-you barrier. This is beneficial for "patients who are bogged down in an egocentric problem cycle" and helps them "to release themselves from their fixation and isola-
  • »
  non.
- Long forgotten or suppressed experiences are brought up again in consciousness, so that "traumatic events may then become accessible to psycho-therapeutic treatment."
- Induction of a mystical-religious experience serving "as a starting point for a restructuring and curing of the patient's personality in the accompanying psychotherapeutic treatment."

ADVERSE REACTIONS

• Sympathetic overactivity is typical for the side effects of LSD, including nausea vomiting, diarrhoea, dizziness, paraesthesias [esp. of the face], anxiety, sweating, dilated pupils, hypotension or hypertension, muscle tension and incoordination, and tremor.

These effects are accompanied by an alteration of visual, and less commonly, auditory and other senses, and a distortion of the sense of position in space. Distortion of the body image may lead to depersonalisation. Disorders of thought and time sense may be accompanied by extreme alterations of mood. Complicated visual experiences result from perceptual disturbance. Panic reactions are most frequent nonpsychotic adverse reactions. Common features are dissociation, terror, fear of going insane or not being able to return to normal. The anxiety often amounts to panic and sometimes to suicide or homicide.

> The autonomic effects are the first to appear. They include dilation of the pupils, piloerection [hair standing on end] and some rise in body temperature. The tendon reflexes are often increased, and muscular tremors and twitching develop in severe reactions. Weakness, somnolence and giddiness may be marked.
> The earliest mood changes are of euphoria or anxiety. Euphoria is usually the predominant change and may extend to feelings of ecstasy, but this can be followed later by sudden swings to depression, panic or a profound sense of desolation. Some subjects become active and excited, while others become quiet, passive and withdrawn. Some are overwhelmed with a sense of mystical experience.
> Others become paranoid and hostile to their surroundings. Much probably depends on the pre-morbid personality of the subject, his expectations, and the setting in which the drug is taken.
> Perceptual distortions, illusions and hallucinations are mainly in the visual sphere but can effect all modalities. Vision may be blurred or astonishingly enhanced and vivid. The perception of depth and distance is changed, size and shape distorted, and colour greatly intensified. Hearing may be dulled or hyperacute, the clothing may feel like sand paper, or the body feel extremely light or heavy. Synaesthesia is often marked and is fascinating to the subject - sensory data are transformed from one modality to another so that sounds or tactile stimuli appear as bursts of light or scintillating moving spectra. Hallucinations are again mainly visual and occur in both unformed and formed varieties - kaleidoscopic patterns of light in intense and changeable colour, or complex visions of animals and people. Tactile paraesthesia, metallic tastes and strange smells are not uncommon, but auditory hallucinations are rare.
> Distortions of the body image usually figure prominently and take bizarre

forms. Customary boundaries become fluid, so that the patient feels he is one with the chair upon which he is sitting or merged with the body of another. His own hands and feet may appear to be transformed into claws or the extremities of a dead person. Sometimes intense somatic discomfort is experienced with feelings of being twisted, crushed or stretched.

> Depersonalisation and feelings of unreality may also be marked. These may extend to the impression of being outside of one's own body, difficulty in recognizing the self in a mirror, or difficulty in deciding whether a thought refers to a real event or is merely a spontaneous thought.
>
> Despite these experiences the subject is able to respond to questions, and conceptual and abstract thinking can usually be shown to be substantially intact. Except in the most severe reactions a large measure of critical self judgement is preserved.
>
> ... After the vivid effects of the drug experience, however, the real world often appears to be drab and dull, and natural events lack the urgent and compelling quality of what has gone before. Some degree of depression and disillusionment may thus be an understandable aftermath.
>
> Acute emotional disturbances are the most common , especially an acute panic reaction in which the subject feels overwhelmed by experiences beyond his control. Sometimes he feels he is going insane or he may react in terror to homicidal impulses. Other acute emotional disturbances include depression, paranoia and outbursts of explosive anger. Acute paranoia may cause the subject to flee about the streets in terror, or upsurges of paranoid jealousy may lead to episodes of explosive anger.
>
> The acting out of impulses is facilitated as self-control becomes diminished. The subject may become unmanageable, run amok, attempt to disrobe or make overt homosexual advances. Sociopathic individuals are more prone to commit acts of violence, and attempted homicide has been reported. Feelings of invulnerability may lead the patient to take unwarranted risks with danger of bodily harm.
>
> [Lishman 1987]

• Its range of effects include, in humans, striking subjective changes in the body image, such as feelings of distortion or free-floating of the body, and fear of mice [or being on friendly terms with them] in cats, changes in webbuilding capacity in spiders, maintenance of a vertical nose-up position and swimming backward in fish, and catatonia in pigeons.

LSD turns the known world topsy-turvy, inside out. The question is whether it is the wrong way up or the right way down.

BLISS

• LSD is viewed as inducing a state of "bliss," as well as bringing other benefits, such as "augmented aesthetic sensitivity, enhanced creativity, occurrence of transcendental experiences, acquisition of new insights, and aphrodisiac effects."

> But the very suggestibility and claimed in-depth confrontation with Self and Other intrinsic to the action of the drug probably makes the exclusion of all painful encounters an impossibility; the same can be said of psychoanalysis and religious mysticism: in Christian tradition, the Dark Night of the Soul is an essential step in the progress of the mystic, and in St. Ignatius Loyola's program of spiritual guidance, periods of "desolation" are expected to alternate with periods "consolation."
> [Daniel M. Perrine, *The Chemistry of Mind-Altering Drugs;* Washington, 1996]

Despite its potential and power, LSD's importance for creative activity and bliss is controversial, or as Peter Matthiessen put it: "Whether joyful or dark, the drug vision can be astonishing, but eventually ... the magic grows boring. ... Drugs can clear away the past, enhance the present; toward the inner garden, they can only point the way. Lacking the temper of ascetic discipline, the drug vision remains a sort of dream that cannot be brought over into daily life. Old mists may be banished ... but the alien chemical agent forms another mist, maintaining the separation of the T from the true experience of the One."
According to anthropologist Peter Furst it is very simple: "The Otherworld' from which you seek illumination is only your own psyche."

FLASHBACKS

• Although not unique for LSD, *"flashbacks* are a striking feature of this drug since it reportedly occurs in as many as 25% of users. Most often the visual system is involved, in the form of three main varieties. "The commonest consists of the repeated intrusion into awareness of some image derived from the LSD experience. This arrives unbidden and is outside voluntary control. It may be accompanied by distortion of time sense or reality sense. It is usually the same image which returns, often of a frightening nature, and considerably psychiatric disturbance can occasionally be provoked. The second variety consists of the spontaneous return of perceptual distortions - halo

effects, blurring, shimmering, distortion of planes, changes of colour, micropsia or macropsia. Thirdly, there may be an increased sensitivity to spontaneous imagery for some time after taking LSD. Such imagery is more vivid than usual, less readily suppressed, and occupies a greater proportion of the subject's thought and time than formerly. [Lishman]

VISUAL OR VISIONARY PERCEPTION

• The most prominent psychedelic effect of LSD is associated with optical sensory input. Experiments on human volunteers conducted by Werner A. Stoll in the late 1940s evoked pronounced changes in the visual perception, in particular when the experiments were carried out in a dark room or with the eyes closed. [When sensory deprivation, however, is pushed so far as taking LSD in a dark, soundproofed float tank its psychedelic potential is greatly reduced.] Among the recorded effects were:

- Flickering; twinkling; sparkling; glistening; flowing of colours and sparks.
- Green and red mists; coloured stripes; spots; rays and strings; multicoloured circles, oval shapes, whirlpools, spirals, bars and rods; nets; coloured wells; shining bubbles, ornaments and arabesques.
- Letters; spider webs; twigs; snowflakes; wood fibres; stone grindings; carvings.
- Benzene rings; butterflies; peacock feathers; dune landscapes; seas; roof-gardens; hideous faces and masks; Buddhas; calyxes and floral structures.
- Visions of brilliant, pulsating, coloured images in firework-like bursts, encompassing every shade and every colour of the rainbow.

The visual illusions were mood-dependent: euphoria was accompanied by the colours red, yellow, and bright green, whereas in depression the colours blue and dark green stood out.
[W. Schmidbauer & J. vom Scheldt, *Handbuch der Rauschdrogen;* Frankfurt am Main, 1999]

• The changed visual perception might run parallel with an increased vision in the sense of revelations, imaginative perception, foresight, or mystical awareness of the supernatural. This would include the ability to see daily reality in a new light and objects as disclosing their "inherent, deep, timeless existence, which remains hidden from everyday sight."

As a consequence, we may expect that patients needing LSD as a homeopathic remedy emphasize the importance of the faculty of sight, colours, shapes, forms, patterns, vivid concepts, mental pictures, imaginative perception, visionary inspiration, foresight, etc.
This allows also a further homeopathic differentiation of remedies derived from psychoactive plants, for which we can take as a starting point the division made by the Chilean psychiatrist Claudio Naranjo. Based on his experience with the use of psychoactive substances as therapeutics, Naranjo suggested the following division:

- LSD [and psilocybin] focus on the transcendental and divine.
- Mescaline [from the cactus Lophophora williamsii; Anhalonium in homeopathy] - focus on beauty.
- Harmaline [from Peganum harmale, fam. Zygophyllaceae] - focus on power and freedom.
- MMDA [synthetic compound derived from myristicine, an active principle of Nux moschata] - focus on loving communication.
- MDA [amphetamin-like compound derived from safrole] - focus on "increased awareness of the I [Self]."

Safrole is a major constituent of sassafras oil [Sassafras officinale, fam. Lauraceae], star anise [Illicium anisatum, fam. Illiciaceae], and camphor oil [Cinnamomum camphora, fam. Lauraceae], and a minor constituent of nutmeg [Myristica fragrans, fam. Myristicaceae] and cinnamon leaf [Cinnamomum zeylanicum, fam. Lauraceae].

• Aldous Huxley, opening *The Doors of Perception,* saw the value of hallucinogenic drugs in that they give people who lack the gift of spontaneous visionary perception belonging to mystics, saints, and great artists, the potential to experience this extraordinary state of consciousness.
Yet, opening such doors entails dangers that must not be underestimated. It might be so that one thinks too highly of one's visionary abilities [delusion being a great person], which, in the case of both LSD and Psilocybin, may lead to a sense of omnipotence and invulnerability, resulting in impaired performance of everyday tasks requiring concentration and coordination or the acting out of fantasies such as a feeling of being able to fly or to stare into the sun.

LIKE A CHILD

• Instead of finding reality irrelevant and not worth the trouble of focusing upon, one can also feel like a child in either an overwhelming world, unable to screen out irrelevant stimuli, or in a new world, as if experiencing it for the first time.

> I could not remember ever feeling quite so unqualified to deal with the physical world. The presence of H. was reassuring to the point of being a necessity; I should have been utterly terrified if he had left me. Taking a potent hallucinogen by oneself, I imagine, would be likely to induce a state of panic, and to throw the entire tenor of the experience into the realm of horror. Did my dependence on H. cause me to feel like a small child, or did my feeling like a small child force me to rely on H's protection? When I ask myself this, I think immediately of the chicken and the egg.
>
> A curious thing is that at the same time, I felt remarkably old and wise. But my wisdom seemed useless when applied to the problem of going outside. It seemed vaguely as though death awaited me there, in some innocuous disguise.
>
> [Paul Moser, self-experiment; cited in: Ebin, *The Drug Experience;* New York, 1961]

• The childlike feeling also came up in Misha Norland's proving of LSD.

> The LSD intoxication is often of such intensity, the experience so real, that the trip becomes the only reality. This imaginary realm fills the field of consciousness and establishes itself as 'the' reality. Other realities are often wiped out. [Although 'observing' consciousness, in those who have this faculty well developed, may maintain a view of both realities simultaneously]. Likewise, that which had been formerly thought of as T or ego loses its hold.
>
> The person is as a small child again. [Many provers felt this way.] However, most individuals are well enough established in their core being to hold their ego structure together, and they may enjoy [or be but temporarily horrified] by the play of imagination as it flits like a will-o-the- wisp upon the outer fabric of sensory perceptions and memories.
>
> Or to put it another way, according to the analogy of levels of consciousness, the trip sets the tripper on the journey from peripheral to core states of being. The peripheral level [of structured memory complexes, states of

knowing] gives way to uncensored memory and sensory impressions, these in turn may give way to states which resemble childhood in that they are open, rather than conditioned. Ultimately perceptions of primordial space may come - unconditioned and spacious. This state can lead to bliss or terror - the good trip or the bad trip.
[Misha Norland, Introduction to The Homeopathic Proving of LSD-25; February 1999]

• Albert Hofmann nevertheless believed that his problem child LSD could become a wonder child "if people would learn to use LSD's vision-inducing capability more wisely, under suitable conditions, in medical practice and in conjunction with meditation."

MATERIA MEDICA

Proving
[1] Misha Norland [School of Homeopathy], 1998; 30c; 10 provers [6 females, 4 males].

Themes
Arranged in headings of the mind proving symptoms:

= Sacred [in the sense of inspiring awe and reverence for nature; this state is coupled with supreme well-being].
Peace & Love. Connection. Truth.

"Meditation: In blackness of space. I feel the vastness of space, see the stars. Look back and see the earth. Feel expansion and limitless. I look at the earth, but space feels my home. Feel light. Try to put myself back to earth - cannot, I'm too light. My gravity is lighter, don't belong there. Moving through space, past planets and spheres. See the sun, fiery. I hear the roar of its energy, see the golden yellow." [prover 2]
"Nothing bothers me. Feel very relaxed. ... Feel a bit irritated by things people are doing like flicking a pen - with any noises that interrupt the peace." [prover 3]
"I was outspoken with my partner - thoughts I'd normally keep to myself were expressed. Feeling of fearlessness. ... Heightened feeling of honesty in expression. Fearless in relationships. ... I go to a group once fortnightly and I was really forthright tonight - very confident in my observations and

comments.” [prover 1]

“Feeling like my truth is readily available, speaking what is true saying it like it is, with no affectations.” [prover 5]

= Merging. Delight in merging with another [God, animal, plant or stone] or deep fear of it.
Loss of ego.
Merging of Senses; merging with Music.

Delusion of dissolution of personal boundaries - between self and child; between self and family and friends; she did not know who she was.
Delusion boundaries between dimensions are thinning; inner and outer realities are inverted.
Delusion of having the consciousness of others; of his consciousness being outside of his body.
Delusion that emotions have colours; that he can see emotions.
Delusion he is in several worlds simultaneously.

Nature, Animals. Immersion of awareness in inanimate objects, animating them.

The increased nature awareness seemed to be particularly related to birds and trees.
“Notice flocks of birds, their movements, patterns and numbers. Feel high, as if my cares have all receded. Nature feels very close to me - enhanced connection with it. Particularly noticed the birds - ravens, crows and pheasants.” [prover 2]
“Still really noticing clouds, and the colours and shapes of nature - fascinated by the shapes of trees.” [prover 3]
“Feeling very attracted to the form of trees. ... I pay a lot of attention to flocks of birds that fly in front of me on the lanes. There are far more than usual.” [prover 5]
“ Notice flocks of birds while driving along - their patterns - beautiful moving forms. ... Noticing flocks of birds [starlings?]. Just want to sit and watch; their movement is like waves; very beautiful.’’[prover 7]

Synthetic derivative of ergot alkaloid lysergic a
Flashbacks and rele [reliving] of repressed t matic experiences.
Transformation and di tegration of accusto world view.
Daily reality in a new li
Sense of mystical experie
Focus on the transcende and divine.
Visual illusions or vision perceptions.
Enhanced colour percepti
Alteration of body image.
Childlike feeling.

= Timelessness.

"Time feels like it's slowed down - I keep expecting it to be hours later in the day than it is." [prover 3]

"Things feel very slow. I feel impassive about things and my thoughts aren't much beyond the moment. ... I have confusion about days of the week and where in the month we are." [prover 5]

"Life seems to have become very busy! Sense of time muddled - as is what day it is. I am a day ahead of myself. ... No real sense of time. ... Sense of time altered. Look at clock and it is 21.00 and then it is midnight. ...

Realized how spaced out I still feel, and how I really have lost all sense of time. It seems to be disappearing very quickly. ... Not so spaced out - but sense of time feels very different. As if time doesn't matter." [prover 7]

" Clairaudience and clairvoyance.

"I notice synchronistic events; I wonder whether to pull out and the car behind pulls out, the radio talks about a fly and the next car to pass me has fly as part of it's number plate." [prover 5]

"Felt like I was on a wave of synchronicity or in slow motion when I was waiting for my bus and rang friend to see if she could give me a lift. The bus went past she said she'd just rung me to see if I wanted a lift." [prover 8]

" Confusion. Distortion.

Distortion of time and space - disorientation and forgetfulness. Restlessness. Disorganised. Disconnection.

"I'm writing numbers backwards, i.e. the 6 before the 1 when writing 16. ... At a dance workshop, I do not always understand what is being said, I hear 'twix' instead of 'twigs' and it takes me ages to understand, I don't get any of the jokes, [prover 5]

"Typing still feels very strange. I can do it if I don't think about it, but when I think about what I am doing I get lost in looking at the keys rather than typing and make loads of mistakes." [prover 7]

"My handwriting is so bad at the moment and I keep getting my words round the wrong way - tongue twisted/tied." [prover 8]

"Restless. I can't keep still - I'm thinking about the next task before I've

completed the current one. ... Feeling resdess already - lots to do, can't decide where to start." [prover 1]
"Unable to settle for mental work. Generally better outside and for physical activity." [prover 2]
"Enjoying doing physical activity e.g. decorating, exercise, etc. but total aversion to study - I can't persuade myself to study and I'm finding it hard to be bothered to try." [prover 3]
"Couldn't seem to focus on any one thing. Trying to do my assignments and work - I kept skipping from one thing to another. Nothing held me and I kept thinking of the odd line to add to the next thing." [prover 7]

"Forgetfulness. I forgot my cash machine pin number - I haven't done this for years. I forgot to turn off the oven - thinking about too many other things. I forgot to drink the cup of tea I made for myself. I am thinking about too many things at once." [prover 1]
"Memory for names and places is shot to pieces e.g. couldn't remember my neighbour's [of 26 years!] name or street/pub names that I've known all my life. Finding it difficult to focus mentally on anything outside of the here and now. Mixing word syllables up in my speech e.g. Denim and Demin; car park = par cark, etc. - in retrospect I've been doing this for a couple of weeks." [prover 3]
"I feel as if I have no sense of home and cry. I have been looking and looking for where to live. Every where I go I ask myself is this home. My Osteopath says I don't feel at home in my body. I'd forgotten that my body was my home." [prover 5]

«· Childlike [in the sense of experiencing things and events in a new manner, as if for the first time]. Often finding things hilariously silly.
Innocence. Giggling. New.
Cosseted.

I felt everyone else was trapped [kids, pregnancy, careers], and I was being sucked into it. I felt a huge pang of desire to travel, for space. I felt so young, unconfident too, small, little, naive and inexperienced. It felt strange to be doing this course or having chosen to so young. I felt I couldn't really communicate and I wanted to be like S. always asking questions, I never know which ones to ask. I always clam up." [prover 8]

<= Unrestricted. Space. Freewheeling.
Expansion.
Exploration, Journeys.

"I was woken by my daughters cough. I had a strange bodily sensation of being a giant puffball - hollow, light, fragile, round. I felt like it. I was it, and it felt just right." [prover 1]

"My mind feels like it's freewheeling - spinning with thoughts which I can't stop - feels as if there's no resistance. Thoughts just pour through so - feels like my mind could just fly off into outer space and bruised sensation on forehead - point 2 inches above each eye worse thinking. Only thing which makes it better is cupping forehead in palms of hands which also makes mind stop freewheeling." [prover 3]

= Youthful. Feeling youthful, exuberant and expectant [like a teenager].
Excitement. Music, Dance.
Courtship, Romance.

"Desire for wine. Desire for conversation. I feel I have more energy, wanting to talk, [prover 1]
Strong desire to listen to *loud,* fast music. [5 provers!]

"I'm talking of 'love' all the time, being in love, falling in and out of love, cosmic and human love. ...
Strong desire to have family and babies." [prover 6]

~ Earthiness. Grossness. Materialism.

"Issues around food and exercise. I had to go for a 2nd walk, even though I've been to the gym and have increased my running from 1 to 1.5 miles. My stomach symptoms are aggravated by eating, bloats up more and thus feels more uncomfortable. I have neurosis around food. I feel fat and have a distorted body image of myself. I feel very anxious about it all, I must do more exercise. [When younger had anorexia and bulimia.] More liable to flare up at husband. 'I don't want to play the wife, nurturing role, I want to be nurtured.' I feel taken for granted. Strong desire for apples again, [prover 2]

"Predominant feeling today and yesterday is of feeling ugly. I tried on a couple of dresses and looked at my hair which is so fine, and I feel mas

culine, ugly I don't feel feminine. I do feel that I look like a man. But what is feminine? I know I should celebrate my curves [cliche], but I don't, I need to detox my liver and get healthy. I feel older and ugly." [prover 8] "Despondent. Feel gross side gaining and spiritual side receding. ... Must not let this remedy dictate to me what I eat - am going to get very fat. ... Fed up with proving. Am eating too much carbohydrate, drinking too much [alcohol]. Have lost spiritual base to life. Gross side is winning. No yoga. No meditation. Aching body." [prover 9]

= Isolation. Desire to be alone.
Numbness. Apathy.

"Feeling of complete detachment from my family. They seem like a million miles away and 1 could be in another world. ... I woke up feeling totally disinterested at the prospect of a day at college studying homeopathy. I resolved to spend time with different people on the course today. As the day wore on I became increasingly lonely and isolated. Feeling like I know nothing. Feeling like I'm a stranger. Feeling disconnected. Feeling adrift. One of the other students asked me if I was OK - I said yes, I felt that if I said otherwise I would cry. I left college, not knowing where to go. I did not want to go to the B&B and I did not want to go to the pub. I did not want to go home. I felt like crying. I drove the car not really knowing where I was going, I got lost and began to panic a little. After an hours driving in pouring rain, horrible conditions, horrible emotional state, I arrived back where I hadn't wanted to be an hour previously - in a warm pub. It felt like I'd just come through a crisis and now I was safe." [prover 11

Repertory rubrics:
Indifference to his personal appearance; to business affairs; to company, society; to duties; to everything; to external things; to family; to joy; to pain; to pleasure; looks for hours out of window.

« Sense of alienation and loss - depression.

"Went out for a drink with some other homeopaths, got very drunk. One lady said that we were lost in London, I turned around and she was gone [she went to look in a shop window] when I saw that she was gone, I cried out where are you. She said that I was like a lost insecure little boy who

has lost his mother. Panic, God I'm lost. Other people on the course said that they had a strange weird feeling being next to me; guess this remedy is like an epidemic or virus. They also said I looked nervous, shaky and scruffy." [prover 6]

" Apprehension. Fear.
Fear of impending danger.
Fear associated with loss of self.

== Death. Decay.

"I still feel sick, trippy, aware of people's expressions being bendy, ugly, deformed, like I'm observing them in slow motion, it's very LSD like." [prover 8]

"I thought for some reason that I was going to die. I would close my eyes for awhile, then open them to make sure I wasn't dead yet. My whole life started flashing before my eyes. An old ugly nurse kept coming over and asking me the same questions over and over and it was driving me insane. 'This is hell,' I thought. I've already died and I'm in hell." [toxicology]

Reflections on the proving

Prover 1

It started with a sense of youthfulness, feeling like I was 21 again, playing 70's music, but not out of nostalgia - I had a real sense of being there, actually of that age. I felt very positive and enthusiastic, and knew I could be completely open and honest with people about my feelings - I felt very confident. My wife said she welcomed this frankness, which completely surprised me! I've really learnt something there, which has had a knock-on effect for our relationship.

Then there was a gradual descent into a reflective, lonely state. I became restless and discontented. I could not concentrate on anything - I felt useless, and I felt depressed about everything. And yet I always had a sense that this was teaching me something, that truth would prevail and that I would be the better for it. I felt very disconnected from people and found great solace in being alone with nature. There was a deeply spiritual aspect to it, and at times a real beauty in my isolation.

I would do a proving again - this has been a wonderful and challenging experience I would not have missed. However, my work and study almost collapsed completely - not such good timing considering I'd just started seeing patients

under supervision. Its taken me quite a while to recover some of the ground I lost through those two months.

Prover 2

Lightness, being out in space. Alienated from the earth. Bubbles of joy. Lightness and energy could contain it. Seeing colours more brightly. See the colours of people speaking. I was in a different space from people. On cloud nine. It didn't really matter. Relaxed any boundaries. Physical energy, had to be physically active. All this energy I had to use. Mental side couldn't focus. Not able to coordinate hands to type in words. Initial high mellowed. Craving fruit and apples especially. Desire ice cream. Issues around food; not knowing what I want. Issues body image. Bloated constantly, affected breathing. Eye problems, watery dry, scratchy. Connection with animals birds, especially sky. Earth not enough had to travel to sun. pmt. Extremely tired. Desire chocolate carbohydrates, coffee. Depression around period. Woke up with immense desolation inside. Meditation meeting the masculine side of my life. Inner peace came back. Time stretching out. Two dreams about horses being mutilated. Looked after stray dog and finding hurt animals. More aggressive or assertive. Initially music very important but after a few days I couldn't listen to music. Couldn't tolerate it.

I started the proving in a very high, expansive and light way. All was joy, connection, and carefree. The senses were heightened and the veil between the physical and psyche was thinner.

Then came the increasing paranoia over food and exercise and the problems with the digestive system.

Things began to slip and were markedly affected by my PMS which was getting much worse.

Concentration was becoming increasingly difficult, with a feeling of not being bothered to keep the diary or keep in contact with the proving supervisor. It didn't matter. My homeopathy assignments suffered as it took me all my time just to keep my head above water, let alone focus on the work.

By the end of the first month I had experienced the majority of symptoms. By the end of the 2nd month I did not feel that I was proving any more, but felt that it had left me in a waste land. I felt that a war had been waged and I was trying to deal with the repercussions of it all.

Prover 3

Disconnected from the whole process of proving. Disconnected from my

emotional process. Disconnected from others around me. Cosseted velvety darkness. Impossible to do any mental work. Felt fine. Strange feeling of distant uneasiness. Nature really heightened. Huge black cloud kicked me in the solar plexus. Dark night of the soul. Hit by a six hundred foot wall of anxiety. Completely disconnected to everything. Back to amazing peace. Lots of eye stuff. Burning, smarting, sensation as if something in left eye. Time distorted, non linear.

Prover 5

Eye pain, too much light. Head pain. Period late. Dizziness.
Big truth. Higher truth. Wider truth. Love.
Left a bit numb do not know what to do with this changed person. More dreams than ever before. Vivid. Darts. Vulnerable people and animals.

Prover 6

Now feel whole again. Half of me ripped away. Lots of lost emotion. In my heart disconnect. Wanting a partner. Wanted to mate. Scary, wild. Hadn't thought about families and children before. Wanted responsibility, commitment and love. Dreams of vampires losing energy, losing life form. Coming out of a cave diffuse through walls, crabs with large claws. Followed by fever, then felt out of proving. Senses heightened. Visual things. Symmetrical rashes. Painful emotional loss. Felt I had lost the female side of me. Music important, played it loud.

Prover 7

Physical symptoms, eye stuff. Feeling the sweetness of foods. No dreams which irritated me, unusual. Got back with ex, amorous, not a good thing. Concentration. If I did it fine, if I thought about it, couldn't do it. Time pushed. Period worst for ages, bright red blood. Restlessness, pacing. Had to do something but didn't know what. Had to eat didn't know what. Looking at flocks of birds. Music very important.

Prover 8

Really disconnected. Felt really high. Sociable, confident, golden, colours really bright. Vivid dreams, sexual dreams. Cold every week. Exhausted. Not sleeping well. Wake feeling exactly like when I go to bed. Very detached from my emotions. Haven't cried. Not heard. Relationship break up. Dreams expressing my emotions. Back to childhood stuff food, etc. music, clubbing wanted really loud music.

Generals

== Activity >; increased; physical. Walking; desire for; in open air >.
= Constant change of symptoms. Contradictory and alternating states.
= Cold air <; aversion to cold air; cold feeling in bones. Desire for warmth.
~ Flushes of heat from least exertion; extending upwards; from anxiety; during sleep.
“ Painlessness of complaints usually painful.
= Weakness from slight exertion; with restlessness; on standing; sudden.

Food & Drinks

== *Aversion:* Cheese. Coffee. Fat. Garlic. Margarine. Tuna fish p).
= *Desire;* Alcoholic drinks. Apples. Beef p]. Celeriac [2], Chocolate. Coffee. Fried eggs. Fruit. Fruit, dried. Ice cream. Meat. Potatoes, mashed p). Puddings. Stimulants. Sweets. Tea. Wine.
— *Worse:* Alcoholic drinks [easily intoxicated]. Coffee. Dried fruit. Sugar. Tea. Warm food. Wine.

Locals
[small selection]

== *Vertigo* & noises in ears. Vertigo during anxiety.
Vertigo on bending head forwards. Vertigo felt in forehead.
Must lie down, but lying down doesn’t >.

“ *Headache* from coffee; > cold air; > ice cream; > warm room; < any jar; < motion.
Numb sensation in forehead.

“ *Vision.*
Accommodation defective or too slow.
Dimness of vision, increasing suddenly and decreasing suddenly.

“ *Throat.*
Sensation of anxiety and apprehension in throat.
Bubbling sensation in oesophagus [also in chest].
Sensation of constriction; dryness [not > by drinking]; of a lump [< in morning].

METHYSERGIDUM **Methys.**

KEYS

- Synthetic ergot alkaloid.
- Medically used as a prophylactic in migraine and other vascular headaches.
- Alcohol, smoking, and coldness <.
- Hungry feeling related to emotions.
- Weight gain.
- Water retention.
- Fibrosis.
- Akathisia.

FEATURES

- Synthetic ergot alkaloid, structurally related to the oxytocic agent methyl-ergonovine and to the potent hallucinogen LSD.

Serotonin antagonist.

Used as a prophylactic in migraine and other vascular headache, such as Horton's syndrome [cluster headache]. Its effect is comparable to that of analgesics such as Cafergot and Migril.

- Passes into the breast milk, inhibits lactation and can cause symptoms of ergot poisoning in infants: vomiting, diarrhoea, weak pulse, unstable blood pressure, and seizures.

Elderly people are especially sensitive to the effects of methysergide as well.

- Both alcohol and smoking increase the harmful effects. The drug increases the sensitivity to cold temperatures.

- Methysergide can cause fibrotic changes and can produce inflammatory fibrosis. Use of methysergide is contraindicated in patients with existing pulmonary disease, rheumatoid arthritis, or valvular heart disease. Use of methysergide in children is contraindicated because it can cause pulmonary fibrosis.

- Congener of LSD. Due to its structural similarity to LSD, methysergide may cause mild CNS stimulation, mild CNS depression, or even LSD-like reactions.

ADVERSE REACTIONS

Cardiovascular:

Postural hypotension; peripheral ischaemia [pale or cold hands or feet; itching; numbness of fingers, toes, or face]; peripheral oedema [hands, ankles, feet, or lower legs]; tachycardia; bradycardia; hypotension [orthostatic]; chest pain; flushing; cardiomyopathy; angina; congestive heart failure.

CNS:

Insomnia; dizziness; overstimulation; drowsiness; mild euphoria; lethargy; confusion; hyperaesthesia; ataxia; hallucinations; psychosis; agitation; fever or chills; akathisia.

Dermatologic:

Skin rash; alopecia; telangiectasia.

Gastrointestinal:

Nausea; vomiting; abdominal pain; diarrhoea; heartburn; colonic ischemia.

Genitourinary:

Retroperitoneal fibrosis; difficult or painful urination; large increase or decrease of urine output.

Haemotologic:

Neutropenia; eosinophilia; haemolytic anaemia.

Neuromuscular & skeletal:

Unsteadiness; loss of coordination; weakness of legs.

Ocular:

Visual disturbances.

Miscellaneous:

Lupus erythematosus; constrictive pericarditis; loss of appetite or weight; weight gain.

[Leikin & Paloucek 1998; Goodman & Gilman 1970]

• Martindale gives a review of the literature on the side effects and benefits of Methysergide.

> In 57 patients treated with methysergide maleate, treatment was discontinued in 4 because of hallucinations, in three because of nightmares, and in two because of psychosis possibly precipitated by methysergide.
>
> In 850 patients with migraine, methysergide 1 to 8 mg daily, benefited 45% without side-effects and 12% were not benefited at all. Side-effects in the remaining 43% included weight gain [30%], severe oedema [4%], severe depression [2%], pain in the calves [26%], disturbed vision [1%], and loss of hair [1%]; 3% were completely intolerant of the drug.
>
> A syndrome resembling systemic lupus erythematosus might occur during therapy with methysergide maleate.
>
> Methysergide, from 2 mg daily, taken for headaches for periods of nine to 54 months, was considered to be responsible for the development of retroperitoneal fibrosis in 27 patients; cardiac murmurs developed in six of them. Fibrotic changes, affecting the aorta, heart valves, and pulmonary tissues, also occurred in a few of the patients and it was suggested that methysergide should be contra-indicated in patients with valvular heart disease, rheumatic arthritis, chronic pulmonary disease, and collagen diseases.
>
> During long-term treatment with methysergide for migraine, three middle-aged patients suffered cardiac infarction [one died], and one patient had acute coronary insufficiency.
>
> In a controlled study, eight of 10 patients who had suffered from typical mania attacks for three to 12 weeks benefited from treatment with methysergide. ... Methysergide inhibited excessive psychomotor activity and drive, and sleeping habits became normal. Seven patients assumed transient depression but no serious side-effects were noticed.
>
> In a double-blind controlled trial there was no evidence that methysergide 6 mg daily was better than placebo in the treatment of ten patients with mania. For talk and behavioural disturbance, methysergide was significantly less effective than placebo.
>
> In a double-blind crossover study in five patients with mania or hypomania, three gave a slight therapeutic response to methysergide, 5 mg daily for 14 days, and two became significantly worse.
>
> Patients with migraine in whom oedema and subsequent diuresis were a feature appeared to benefit most from methysergide 4 mg daily for three months.

Methysergide, given prophylactically in a dosage of 3 mg daily for three months to 67 patients with migraine, was effective in preventing or diminishing attacks in 26.9% compared with a response of 9% when a placebo was given. Patients with premenstrual migraine seemed much less likely to respond. Side-effects were gastrointestinal disturbances, ankle oedema, and mental disturbances, but these were not severe.

Methysergide gave as good a control of sleep attacks as dexamphetamine in five patients with narcolepsy, but the cataplexy, present in four, was less well controlled. Two patients developed severe calf claudication during treatment.

[The Extra Pharmacopoeia 1977]

MATERIA MEDICA

Synthetic ergot alkaloid. Medically used as a prophylactic in migraine and other vascular headaches.
Alcohol, smoking, am coldness <.
Hungry feeling relatei to emotions.
Weight gain. Water retention.
Fibrosis.
Akathisia.

Proving

[1] Julian, 1978-79, 27 provers [21 men, 6 women]; 30c, 7c, 3x.

SYMPTOMS

Mind

= Depression & tendency to weep.
" Forgetfulness.
» Hurry during physical and mental activity.

Energy - activity

» Low energy state or *increase of general activity.*
<·* Sensation of fatigue in the evening.
~ Akathisia: inability to remain in a sitting posture, with motor restlessness, sensation of anxiety, and a feeling of muscular quivering. Patients often need to pace. [Observed as an adverse reaction to methysergide.]

Temperature

<* Great heat and restlessness at night [2-3 a.m.].
» Congestion of face, painful and intense.

Appetite
= *Hungry* feeling, related to emotions [contradiction or vexation].
<= Hunger & increased physical and mental power,
<= Coated tongue and nausea in morning; cannot take breakfast.

Sleep
= Waking after midnight; 2-3 a.m.
Caused by stomach pain, heat or restlessness.
= Sleepiness after eating.

Sensations
— Emptiness [head; stomach].

Modalities
= < Cold [general; esp, in evening].
= < 4 p.m. - 5 p.m.
= < Motion [pain in left shoulder, wrist, hip, knee],
= > Eating [nausea].
= > Lying down [nausea; pain in left shoulder, wrist, hip, knee].

Locals
= *Headache* in occiput; extending to right eye. “As after having drunk wine.”
< Exertion; during menses [headache].
& Heaviness in nape of neck.
& Twitching of right side of face.
= Twitching of the eyelids on moving the head, or when bending forward or sideways, followed by short-lasting contractions of the eyelids.
== Dryness of mouth and throat on waking.
— Pharyngitis, left side, & copious transparent nasal discharge.
= Cough from irritation in larynx; dry, persistent, at daytime.
= Oedema of lower limbs.
— Hypoglycaemia.

[Adapted from: O.A. Julian, Eine Arzneimittelpriifimg mit Methysergid; Allgemeine Hom. Zeitung, 1981, 226:3.]

CORDYCEPS

FEATURES OF THE GENUS CORDYCEPS

• Genus of some 120 species of entomogenous fungi [fungi that parasitize insects or arthropods].
• May be either quite limited in their host range or may parasitize a great many different species of insects.
• Fructifications spring up directly from their victims, in the shape of a club [Gr. *kordyle* = club].
• These fructifications arising from an insect larva or pupa are known as 'vegetable caterpillars.'
• Cordyceps spp. incorporate elements from more than one kingdom.
• *"Cordyceps,* which must infect target organisms that are clearly far scarcer than rye flowers, goes a big step further than *Claviceps* in the multiplication of spores by producing an estimated sixty-four million spores from a single stroma." [Kendrick]
• For most Cordyceps species the complete life cycle, i.e. the teleomorph- anamorph connections, has not been definitely observed. The asexually reproductive [anamorph] phases of Cordyceps spp. are usually called moulds.

SPECIES

• The species *Cordyceps sinensis* parasitises on the larvae of the bat moth Hepialus armoricanus. The moth, and thus the fungus, is found only in the high and cold elevations of the Himalayas and China's mountains.

• *Cordyceps subsessilis* is a rare species occurring in North America and Europe and parasitising on scarab beetle larvae. Its anamorph, the white mould Tolypocladium inflatum [niveum], produces cyclosporins.

• The Australian *Cordyceps gunnii* [formerly C. gardneri] has a stalk as fat as a garden hose and as long as 30 cm. It invades a root-feeding caterpillar and then elongates until its tip emerges into the air through the opening to the insect's burrow. The deeper the burrow is in the soil the longer the stalk.

CORDYCEPS MILITARIS **Cordyc-m.**

Scientific name	Cordyceps militaris	(L.:Fr.) Link 1833.
Synonym	Clavaria militaris L.	1753.
Common name	Caterpillar Fungus.	
Family	Clavicipitaceae.	

KEYS

- Parasite on larvae and pupae of moths.
- Bright crimson or orange-red.
- Groups "look like a regiment of toy soldiers."

FEATURES

• *Cordyceps militaris* is found in North America and Europe. It has tufted stromata that are bright orange at first but fade to yellowish with age or weathering. It parasitises on larvae and pupae of lepidopterous moths. Its anamorph was previously classified in Cephalosporium but is now placed in Verticillium.

> *Cordyceps militaris* is fairly common in autumn in hedge banks, damp lawns and woodlands, appearing as bright crimson or orange-red waxy clubs narrower at both ends, the upper fertile portion showing slight punctations marking the openings to the perithecia. Below ground the fruit-body can readily be traced to a larva of pupa of a Lepidopteron. The insect, when cut open, is found to be a solid mass of mycelium, the whole of the inside having been replaced by fungus; the only part of the insect remaining is the integument, which surrounds what is essentially a fungal sclerotium.
>
> [The fungus] usually occurs singly or in small numbers. During the British Mycological Society's autumn foray in 1923, however, hundreds were seen on a lawn at Armathwaite near Keswick, looking like a regiment of toy soldiers.
>
> The spores are forcibly ejected from the asci: the effect of wind and moisture on this puffing' was studied so early as 1775 by Muller. They are very long and filiform and break up at maturity into the numerous short segments formed by the 160 or more cross septa. Germination takes place on

the skin of a caterpillar if only slightly moist.
[Ramsbottom 1953]

MATERIA MEDICA

See Cordyceps sinensis.

CORDYCEPS SINENSIS **Cordyc-s.**

Scientific name Cordyceps sinensis (Berk.) Sacc. 1878.
Common name Chinese Caterpillar Fungus.
Family Clavicipitaceae.

KEYS

- Parasite on larvae of a bat moth.
- Found only in high and cold mountainous regions.
- Altitude sickness.
- Record-breaking performance.
- Affinity with respiratory system.
- Enhances endurance.

THERAPEUTICS

Traditional

• Cordyceps sinensis, or Chinese Caterpillar Fungus, has an ancient use in China as the drug *dong chong xia. cao.* It is officially listed in the Chinese Pharmacopoeia and is used as haemostatic, anti-asthmatic, and expectorant in the treatment of respiratory diseases and as a tonic.

In traditional Chinese medical texts, Cordyceps is described in detail and is considered potent at strengthening lung and kidneys, increasing energy and vitality, stopping haemorrhage, decreasing phlegm, and as an overall tonic. Kidney weakness is in Chinese medicine associated with impotence, back pains, and night sweats.

Cooked with chicken it helps the body to adjust to seasonal changes in early spring and early winter.

Performance

• Members of the Shanghai wrestling team consumed a few fungi attached to dead caterpillars before entering the arena. In September 1993, at the Chinese national athletics Olympic trials, Chinese women long distance runners shocked the world by shattering previous track and field world records. The records still stand. Ma's Family Army guided by the maverick coach Ma Junren had earlier that year, at the Stuttgart world championships,

"dazzled the world by bringing up a squad of runners as if from nowhere." Ma Junren had managed "to make world champions and world record-holders out of a group of rustic peasant girls," reported the media. Any explanation seemed better than having none at all. Some came with absurdities as that the runners were "fuelled by a diet of turtles blood and a brutal regime of running a marathon a day at altitude." Others cried foul, convinced that anabolic steroids or other performance-enhancing drugs had been taken.

But the urine tests came up negative. If the athletes had taken drugs, the tests did not show it. When reporters pressed him to say why his athletes ran so well, Coach Ma Junren mentioned their rigorous training schedule, their passionate commitment to track and field, and a secret elixir made from the *Cordyceps sinenses* mushroom. [All of Ma's runners had a falling out with their disciplinarian coach and only one made the team that China sent to the 1994 World Track Championships. Ma claims that his runners' performances lapsed because they no longer had access to his secret elixir.] [Halpern & Miller 2002]

The possible contribution of Cordyceps to the successes became further overshadowed when two members of Ma's Army tested positive two months from the Sydney Olympics in 2000. Although unable to transform rustic peasant girls into gold medallists, Cordyceps does build up endurance. Research has indicated that it enhances oxygen uptake by the brain and heart while improving resistance to hypoxia.

Pulmonary disorders

• C. sinensis grows at altitudes of 3,000 metres or more in cold, grassy, alpine marshlands of mountainous regions. Natives eat the fungus right out of the soil to prevent altitude sickness. The use of Cordyceps sinensis in the treatment of respiratory diseases is centuries old. Cordyceps has an extensive history of use in the treatment of chronic bronchitis, especially in elderly patients, and of asthma, chronic obstructive pulmonary disease [COPD], tuberculosis, cor pulmonale, and other diseases of the respiratory system.

Several studies have demonstrated an improvement in clinical symptoms of respiratory diseases after the administration of a Cordyceps-containing

medication. For example, the vast majority of patients with various respiratory diseases, such as chronic bronchitis, bronchial asthma, or cor pulmonale, reported a significant clinical improvement after Cs-4 treatment [Cs-4 is cultured C. sinensis mycelium], ... In other studies, Cs-4 treatment of patients suffering from chronic bronchitis or bronchitis with asthma resulted in very high rates of clinical improvement, versus the representative control groups. Improvements in respiratory capacity were also noted in these studies.

> ... After being treated with Cs-4, elderly patients with chronic obstructive pulmonary disease showed a marked improvement in cough, phlegm, appetite, vitality, and pulmonary symptoms.
>
> ... Cs-4 has also been used in combination with other drugs to treat patients suffering from cor pulmonale, either acute or recurring acutely with first-degree to third-degree heart-lung dysfunction. Addition of Cs-4 to the basic treatment of oxygen inhalation and antibiotics resulted in a highly improved overall rate of therapeutic effect when symptoms, including asthma, cough and expectoration, sleep, emotional-spiritual state, respiratory functions, and heart functions were assessed.
>
> This improvement was significantly greater than the overall effective rate reported for the control group, which received basic therapy without Cs-4. The results indicated a greater improvement in quality of life for the patients after administration of Cs-4.
>
> ... In addition to the promotion of higher bioenergy levels by Cordyceps, researchers examined oxygen consumption by mice and their ability to survive after Cs-4 therapy in a hypoxic environment, to elucidate the effects of Cs-4 on oxygen utilization efficiency. Under conditions of stimulation of oxygen consumption by a subcutaneous injection of isopre- naline, Cs-4 extract significantly reduced oxygen consumption by the mice by 41% to 49% within ten minutes and by 30% to 36% in the second ten minutes, as compared with controls.
>
> In a low-oxygen environment, the mice lived two to three times longer after the Cs-4 treatment. The Cs-4- induced reduction of oxygen consumption and the prolonged survival of treated animals in a hypoxic environment indicated a more efficient use of oxygen to support essential physiological activities of organs/tissues and greater tolerance to hypoxia-induced acidosis than that of the controls.
>
> ... The enhancement of physical performance and amelioration of quality of life in response to Cs-4 treatment may be attributed to the improvement of energy states with greater efficiency of oxygen utilization, as well

as to the function improvement in oxygen scavenging and in pulmonary, cardiovascular, and other systems.[1]

The special affinity with the respiratory system is confirmed by the use of the species Cordyceps robertsii by the Maoris of New Zealand, who grind caterpillar and fungus into a powder for the treatment of asthma.

Studies

• Hobbs [1995] and Halpern & Miller [2002] have reviewed studies investigating the effects of Cordyceps sinensis in vivo in groups of healthy volunteers and patients. These studies reported effects on cardiovascular, immune, liver, kidney, skeletal muscle and respiratory function, and glucose and lipid metabolism.

• Overall enhancement of physical capability and endurance and antifatigue effects were noted in several studies.

Placebo-controlled clinical studies examined the effects of Cs-4 therapy in elderly patients with fatigue and other senescence-related symptoms. Compared with no improvement in symptoms in the placebo-treated patients, most of the Cs-4-treated patients reported overall clinical improvement. The subjective improvements included alleviation of fatigue [92%], cold intolerance [89%], dizziness [83%], frequent nocturia [59%], tinnitus [79%], hyposexuality [14%], and amnesia [26%].

A double-blind, placebo-controlled clinical trial in 59 elderly patients [ages 60-84] with various symptoms of senescence found an extract of the cultured mycelium [Cs-4 strain, 3g/day for three months] alleviated fatigue in 92%. Many of the patients also showed improvements in frequent nocturia [59%], amnesia [26%], hyposexuality [14%], dizziness [83%], tinnitus [79%], and intolerance to cold [89%], compared to significantly less improvement in the placebo-control group.[2]

Constituents

• Compounds in Cordyceps include polysaccharides; nitrogenous compounds; B-vitamins [Bl, B2 and Bl2]; vitamin E; vitamin K; all the essential amino acids; fatty acids; ergosterol and sterols.

Polysaccharides in Cordyceps and other fungi have shown hypoglycemic, hypolipidemic, immunostimulating and antileukemic activities.

Adverse effects

• Concerning adverse effects the usual claims are: "none reported" or "with only few and mild side effects." Possible side effects were reported in some hyperlipidemic patients who complained of dry mouth, skin rashes, drowsiness, nausea and diarrhoea while taking an extract of the cultured mycelium [strain Cs-4, 3 x 333 mg 3x/day for 4-8 weeks],

1-2 J.S. Zhu, G.M. Halpern & K. Jones [1998]: The Scientific Rediscovery of an Ancient Chinese Herbal Medicine: Cordyceps sinensis. Part I. Journal of Alternative and Complementary Medicine 4[3], pp 289-303; Part II. Journal of Alternative and Complementary Medicine 4[4], pp 429-457.

MATERIA MEDICA

• The symptoms listed under Cordyc. [Cordyceps militaris] in the repertory [Synthesis 9.0] stem largely from Murphy's Homeopathic Remedy Guide, in which the "Caterpillar fungus, a Tibetan mushroom" is given as the source of the symptoms. This fungus, used by "Tibetan herdsmen in the Himalayas to vitalize their yaks," is Cordyceps *sinensis,* not Cordyceps militaris, the latter being a native of north temperate regions such as North America and Europe. Hence the symptoms should be placed under Cordyc-s.

Parasite on larvae of a bat moth. Found only in high and cold mountainous regions. Altitude sickness. Record-breaking performance. Affinity with respiratory system. Enhances endurance.

• As to its homeopathic application, Murphy writes: "Cordyceps is an energy and stamina booster. It increases athletic performance especially in long distance races. Chronic fatigue. Shortness of Breath. Weak stamina. Mountain Sickness. Lack of strength and endurance. Mental and physical exhaustion due to over work. Alzheimer's disease. Sexual debility. Nerve weakness. Antidotes opium and narcotic withdrawal symptoms. [Avena]." The clinical indications include:

Anemia. Asthma. Bronchitis. Chronic fatigue. Emaciation. Exhaustion. Hepatitis. Mental weakness. Senility. Shortness of Breath. Tuberculosis.

CYCLOSPORINUM **Cyclosp.**

• Produced by Tolypocladium niveum, the anamorph stage in the life cycle of Cordyceps subsessilis.

KEYS

- Cordyceps subsessilis parasitises on scarab beetle larvae.
- Alien invader.
- Metamorphosis: Winter Worm, Summer Plant.
- Organ transplantation.
- Immunosuppressant.
- Renal impairment and hypertension.
- Nocturnal aggravation; unrefreshed in morning.
- Stitching/ burning pains.
- Right side.

METAMORPHOSIS

Its unique lifecycle has given Cordyceps the name 'Winter Worm, Summer Plant' in China.

> If you can muster any empathy toward an insect or spider, *Cordyceps* can seem a terrifying adversary. The fungus is capable of piercing the chitinous exoskeleton of insects; once it is inside, the symptoms of disease become obvious. Ants colonized by a *Cordyceps* engage in hopeless grooming behaviour and move with an erratic gait, their legs twitching uncontrollably. In the most spectacular display of torment, epileptic insects wracked with convulsions climb plant stems and ooze mucus from their mouthparts. In their death throes they grip the top of the stalk with their legs, clamp down with their can-opener mouthparts, and expire. ... But for the pathogen, the outcome never varies. A few days after death, its hyphae burst through joints in the insect's skeleton, cloaking the animal in mycelium before sprouting the elongated fruiting body.
> ... Climbing behaviour is also observed in insects infected with other kinds of fungi. The term *summit disease* is applied to insects manifesting this symptom. By scaling vegetation, colonial insects remove themselves from their nests, limiting the opportunity for an epidemic. The selfburial

strategy may also have evolved to protect the sickened insects relatives from infection. Such gallant and seemingly altruistic actions make sense for sterile animals like worker ants, which may have hundreds of thousands, if not millions of identical sisters.

> In biological terms, selfless actions serve oneself in the colony because the genetic legacy of each worker depends entirely upon the health of the queen and her suitors. Alternatively, the fungus might be exerting direct control over the insects behaviour by manipulating its brain chemistry. Although purely hypothetical, the neurological symptoms exhibited by infected insects make this a very provocative idea. By inducing the summit response in its host, the fungus would place itself in an ideal position for wind dispersal of its spores. [Money 2002]

At the beginning of autumn, Cordyceps releases its spores and invades a caterpillar. Throughout the winter it eats away the tissues of the hibernating caterpillar, filling them up with its hyphae. The caterpillar does not transform into a butterfly in the spring; instead, the fungus sprouts long stalks of its fruiting plant-like body. A worm in the winter, a plant in the summer. The stalk of the plant dies in the winter and the root becomes a worm. In medieval times these quaint creatures, half animal and half plant, were likewise believed to exemplify a transmutation from the plant to the animal kingdom. Cordyceps incorporates elements from both kingdoms. It transplants itself into an animal, leaving its external appearance intact, to re- emerge in the guise of a clubmoss-like plant. Half animal, half plant, and yet it is neither.

In Franz Kafka's short story *Die Verwandlung* ['The Metamorphosis,' 1916] Gregor Samsa wakes one morning to find himself transformed into a giant beetle. "But he experiences none of the fright that one might expect. It is his cool aloofness, his apparently objective consideration of the situation, his petty anxiety about trifles [to avoid confronting the appalling reality], which makes the story so frightening. Samsa's transformation is not seen as something amazing, but only as a nuisance, and a minor nuisance at that, to be glossed over by himself and his relatives. ... Kafka's short life [1883-1924] invites such interpretations. ...

His particular situation ensured that he would write from an alienated viewpoint: as a Jew he didn't belong with the Christians; as a German-speaking Jew born in Prague he didn't belong with the Czechs; as a middle-class Jew

he didn't quite belong with the poorer Eastern Jews; nor did he belong with the dominant Austrians.

Finally, as the son of a well-to-do citizen he didn't belong with the workers, though he was employed for many years by the Workers' Accident Insurance Institute for the Kingdom of Bohemia. Everywhere he experienced alienation, and the literary universe he created, this world of language, reflects his painful estrangement. ... Powerless, unable to affect their own destinies, Kafka's heroes can only try to interpret the world. Kafka's stories are almost a fictional version of scientific experiments: having established the experimental situation, he tests his abstract characters to find out something about them and their world."[1]

Through its stalked fruiting body Cordyceps creates new life from the grave of its victim. "Conflict at the biochemical level has probably been equally fierce," assumes Money, "with the proliferation of toxic and antitoxic cocktails of ever-increasing strength within both host and pathogen."

It is striking that *Cordyceps subsessilis,* of all living organisms, yields chemicals that have transformed organ transplantation. It does this in its asexual [anamorph] stage named *Tolypocladium [inflatum] niveum.* Of these chemicals

- 25 different cyclosporins - Cyclosporine A has become the treatment of choice following kidney, heart, lung, bone marrow, and combined heartlung transplantations. Cyclosporine A, known as Cyclosporine, is used to prevent rejection and in the prophylaxis of host-versus-graft disease, the fight that the host puts up with the transplant, as it would a disease, treating it as an alien invader.

Organ transplantation involves incorporation of elements from more than one human being, a "life-and-death excitement" that "could bring out a ruthless edge, a belief that 'medical progress' is an end which justifies almost any means. Critics allege that such incidents epitomize the disturbing inability of today's high-tech medicine to accept the autonomy of patients and the reality of death."[1 2]

1 Franz Rottensteiner, *The Fantasy Book,* New York 1978.

2 Roy Porter, *The Greatest Benefit to Mankind,* London 1999.

IMMUNOSUPPRESSION

Cyclosporin was first isolated from Tolypocladium niveum in the 1970s in the course of screening fungal products for antifungal activity. Its spectrum as an antifungal antibiotic proved to be too narrow to be of any clinical use. When tested for cytostatic, antiviral and immunosuppressive activity, however, the compound showed powerful yet selective immunosuppressive activity, inhibiting the multiplication of lymphocytes but not that of other somatic cells.

The discovery soon revolutionized the field of organ transplantation, significantly reducing the morbidity and the incidence of rejection. Cyclosporin A is currently the most widely used drug for preventing rejection of human organ transplants. By 1996, 200,000 transplant recipients were using it daily. The number is undoubtedly much higher now due to the ever-increasing number of organ transplantations as well as to the use of cyclosporin in the treatment of psoriasis, psoriatic arthropathy, atopic dermatitis, rheumatoid arthritis, and inflammatory bowel disease.

ADVERSE REACTIONS

The commonest and most serious unwanted effects of cyclosporin are renal impairment and hypertension. After prolonged treatment nephrotoxicity may not be completely reversible. The increase in blood pressure from cyclosporin treatment can be detected even in the short term. Calcium antagonists are known to increase the plasma level of cyclosporin.

Cyclosporin may raise serum cholesterol and triglyceride levels and urate levels, and may also to some degree impair glucose tolerance.

The drug is metabolized in the liver and 90 percent is eliminated in the bile. Under the "less important unwanted effects" Rang et al. include "anorexia, lethargy, hirsutism, tremor, paraesthesia, gum hypertrophy and gastrointestinal disturbances."[1]

Leikin and Paloucek [1998] provide a more complete, and realistic, overview of adverse reactions:

Cardiovascular:

Hypertension; hypotension; tachycardia; facial flushing; peripheral oedema; flutter [atrial]; chest pain; angina; vasoconstriction.

CNS:

Convulsions; headache; psychosis; visual hallucinations; ataxia; parkinsonism.

Dermatologic:

Hirsutism; acne; alopecia; nodulocystic acne; bullous lesions; hyperplastic pseudofolliculitis barbae.

Alimentary canal:

Gingival hypertrophy; abdominal discomfort; nausea; vomiting; colitis; pancreatitis.

Neuromuscular & skeletal:

Tremors; myositis; leg cramps; paraesthesia; clonus; myoclonus.

Ocular:

Cortical blindness; diplopia; permanent blindness.

Miscellaneous:

Susceptibility to infection [increased]; sensitivity to temperature extremes; incidence of lymphoma [increased]; Kaposi's sarcoma; mutism; basal cell carcinoma; malignant melanoma; warmth; systemic lupus erythematosus [SLE],

1 H.P. Rang, M.M. Dale & J.M. Ritter, Pharmacology, 4th ed.; Edinburgh 1999.

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Proving

[1] Souk-Aloun, 1990; 30c during one month; 6 provers [2 males, 4 females], [S]

[2] Norwegian Academy of Natural Medicine, 1991-1992; 12x, 31 provers; 200x, 8 provers. [B]

[S. Bruset et al., *Arzneimittelprufung von Cyclosporinum;* Allgemeine Homoopathische Zeitung, 1/95.]

SYMPTOMS

Mind

“ Anxiety and restlessness about 10 p.m.; & heaviness forehead. [S]
« Beautiful and vivid dreams. [S]
= Dreams of conspiracies; “that people are plotting against him.” [S]
“ Quickly irritated and angry; forgetful. [B]
“ Panicky fear in darkness. [B]
= Extreme restlessness, cannot focus on anything, must constantly do something else [3]. [B]

Generals [B]

« Dryness [hair; eyes; nose, esp. right side; face; mouth].
» Decreased desire for beer and coffee.
» Aversion to sweets.
“ Craving for salt; broth; chips; salty lozenges; salty meat; smoked food; beer.
= No thirst; hardly any appetite [11 a.m. - 2 p.m.].

Nocturnal aggravation

“ Headache at night in bed, felt in half-sleep; at beginning of menses. [S]
= Contraction and tingling in masseter muscles on waking at 3 a.m. [S]
“ Throat dry and painful on waking at 3 a.m. [S]
“ Sensation of a foreign body in throat on waking at night. [S]
= Sticky mucus in throat at night. [S]
= Cannot sleep from pain in stomach. [B]
“ Pain in abdomen at 3 a.m. [S]
= Waking from pressure on bladder; feels it continuously during sleep; has to rise to urinate, but produces only a small amount of urine; dreams of micturition. [B]
« Difficulty sleeping due to pain in chest. [B]
·» Icy cold feet in bed. [B]
« Warm feet > putting feet up. [B]
= Constant waking up and falling asleep again, exhausted in morning. [B]
= Sleeplessness until 3 a.m. [B]
= Dreams of persecution [3]. [B]
= Cannot sleep when lying on the back; sleeps better when lying on left side. [B]
— Waking after 3 a.m. from dreams. [S]

Other modalities -	**Aggravation [B]**
= 3-8 p.m. <.	Headache above/ around right eye.
<·> Beer <.	Headache above/ around right eye.
= Bending <.	Soreness posterior side thighs [worse left side].
= Bending double <.	Nausea.
= Breakfast <.	Vomiting.
<= Closing eyes <.	Vertigo. Itching eyes.
= Cold air <.	Burning in throat.
= Eating <.	Sour taste in mouth.
=> Eclectic <.	Headache above/ around right eye.
= Eyelids sticky and swollen. [S]	Headache extending to ears.
= Pain in abdomen. [S]	Nausea mornings. Pain chest. Shooting, sharp pain
« Hacking cough. [B]	spine.
= Inspiration <.	Pain from right ear to throat.
= Motion <.	Stitching pains in chest. Sensation of constric-
	abdomen to rectum/ lumbar region. Sharp pain

Worse on waking in morning

=> Headache [vanishing gradually during the day]. [S]

= Eyelids sticky and swollen. [S]

= Pain in abdomen. [S]

« Hacking cough. [B]

“ Greyish-white, thick expectoration. [B]

= Awakes with violent stitching pains in chest. Sensation of constriction [4]. [B]

~ Pain in nape of neck. [S]

= Pain in left elbow [3], < touch and stretching arm, extending to fingers. [B]

= Weariness. [S]

=» Drowsiness [lasting during daytime]. [S]

= Great desire for sleep; as tired in morning as in evening before going to sleep. [B]

«· Hungry on awaking. [B]

« Sleeplessness, to sleepiness at daytime. [S] = Chilliness in bed, except for the feet. [B] = Heat alternating with chilliness at night. [B]

Cordyceps subsessilis parasitises on scarab beetle larvae. Alien invader. Metamorphosis: Winter Worm, Summer Plant. Human transplantation. Immunosuppressant. Renal impairment and hypertension. Nocturnal aggravation; unrefreshed in morning. Stitching/ burning pains. Right side.

right shoulder. Nape of neck painful, stiff Burning pain from balls of thumbs upwards to inner side of arms.

= Pressure <. Pain from left side abdomen to rectum/ lumbar region. Sensation as from an electric shock in fingers of both hands. Stitching pain in middle of right hand.

= Sitting <. Pain from left side abdomen to rectum/ lumbar region. Tired feeling in back.

= Smell of petrol <. Vertigo.

= Standing <. Bearing down sensation uterus.

= Stooping <. Headache above/ around right eye. Stitching pain right temple. Sensation as if heart moves about. Shooting, sharp pain spine.

= Stress <. Headache above/ around right eye. Pain left elbow.

— Stretching arm c. Itching in ears. Burning in throat.

— Swallowing <. Toothache.

Throatache extending to ears.

= Sweets <. Pain left elbow.

= Tobacco smoke c. Dry cough.

= Touch <. Itching facial skin.

= Warm room <.

= Bending forward >. Sudden stomach pain.

= Closing eyes >. Stitching pain behind eyes.

= Coffee >. Headache above/ around right eye.

» Cold air >. Headache above/ around right eye.

= Eating, after >. Sore, dry throat.

Other modalities - Amelioration [B]

= Eructations >. Stopped sensation ears.

= Evening >. Sneezing.

= Motion >. Headache above/ around right eye.

«■ Moving feet >. Cramps feet.

= Open air >. Throatache. Nausea.

= Pressure >. Stitching, pulsating pain temples. Pain from right ear to throat.

« Putting feet up >. Warm feet.

= Rest >. Vertigo. Pulsating headache left side. Nausea.

Sharp pain right shoulder. Nape of neck painful, stiff.
Burning pain from balls of thumbs upwards to inner side of arms.

<- Sitting >. Bearing down sensation uterus.

= Sleep >. Headache above /around right eye.

» Stool >. Bursting sensation stomach. Cramps stomach after breakfast. Menstrual pains [temporary >].

Warm applications >. Nausea.

= Warm bath >. Burning pain from balls of thumbs upwards to inner side of arms.

Sensations as if [B]

= As from an electric shock. Right or left side abdomen. Rectum. Fingers of both hands.

Pains [B]

= Burning.

= *Stitching.*

Vertigo [B]

= Vertigo [3] in morning on rising [3]; in forenoon [3]; from strong smells [eg, petrol].

> Rest.

< Closing eyes [3].

Head [B]

«= Headache, 3-8 p.m., above/around right eye [4],

& Dimness of vision and nausea.

< Beer.

> Cold air; motion [2].

~ Headache from noon to 4 p.m.

< Stress; exertion; stooping.

> Coffee; sleep.

» Pulsating pain in occiput extending to forehead. [3]

» Stitching pain in right temple.

< Motion; stooping [3].

= Sensation of looseness in head.

Eyes [B]
« Stitching pain behind eyes [3], > closing eyes.
» Muscular twitching right eye.
— Dryness right eye [2],
= Itching eyes [4], < closing eyes.

Ears [B]
«■» Obstruction > eructations.
=» Pain in right ear extending to throat.
< Lying on right side.
> Pressing painful side.
= Itching in ears < swallowing.

Nose [B]
= Pressure on nose as from too tight glasses. [B]
« Catarrh; thick, white discharge [4]; frequent attacks of sneezing [4]; lachrymation [3].
< Morning [sneezing].
> Evening.
<=» Nose obstructed [3].
< Morning [& burning from throat extending to ears] [3].
= Loss of smell.

Face [B]
<= Dryness around mouth.
“ Lips dry, parched in evening; burning sensation in morning and evening [3].
= Skin of face as if thin and tight [3]; itching < washing.
== Skin of face [and body] very dry.

Mouth
« Swelling salivary glands left side [3]; cheek and tongue swollen. [B]
= Increased salivation [3]. [B]
« Metallic taste in mouth and thin, white coating on tongue before breakfast. [B]
= Bad taste in mouth; breath offensive; sour taste, lasting for some time after eating [3]. [B]
= Taste of chlorine in mouth. [B]

Teeth
» Bleeding of gums. [S]
= Toothache < sweets. [B]
« Icy cold, drawing sensation in teeth [lower front teeth]; difficulties chewing something sour/hard. [B]

Throat [B]
» Throat pain < morning, evening, extending to ears [4]; < indoors, tobacco smoke.
» Burning pain < cold air, swallowing.
« Throat pain [3], > open air, < at night.
» Sore, dry, must swallow [without >], evening/ night from 11 p.m.; > morning, after eating.

Stomach [B]
« Stomach pain while sitting. [S]
« Nausea, [car sickness, 3-7 p.m.].
< Bending double.
> Rest; open air; warm applications.
<= Nausea in morning, < inspiration.
« Nausea, coming and going, lasting for about 15 minutes.
» Stomach hard and painful; burning.
« Sudden pain > bending forward.
« Empty sensation, even after breakfast.

Abdomen [B]
» Bursting sensation > stool.
= Distension; flatulence; offensive flatus and stool.
» Stitching pain (2), 2 p.m., in right side of abdomen, then in left side, with regular intervals over the day; short-lasting [1 minute], as from an electric shock (3].
- Pain left side [2], extending to rectum; < pressure, motion.

Rectum [B]
» Pain as from an electric shock [3], short-lasting, < sitting.
“Tearing pain in rectum [2]; as if something must come out [4], sputtering diarrhoea.

Stool [B]
= Diarrhoea-like; yellowish brown, offensive, copious.
= Diarrhoea [2]; violent pains during stool.
«· Mucus in stool. Undigested food, whitish.

Urinary [B]
<· Micturition painful [3].
= Fulness bladder. Has to urinate constantly, morning/ forenoon [2].
= Urging to urinate shortly [5 minutes] after micturition [3], small amounts.
= Pain before micturition [4].

Female [B]
= Menses too late; less copious. [S]
=» Menses five days too late, much pain.
— Menses too early, & bearing down sensation < standing, > sitting.
== Menstrual pains [4], > for a short while after stool, then worse again.
= Menses less than usual, but more painful, especially first day.
= Menstrual bleeding in paroxysms, ceasing when lying.
~ Stitching pain in left ovary [2] or right ovary [from noon to midnight] [3].
= Drawing sensation from ovary backwards to loins/renal region; sensitive, hot [2],

Larynx [B]
= Hoarseness in morning.

Respiratory [B]
= Dyspnoea, dizzy, as if breathing in a sauna.
= Extremely dry cough whole day < warm room.

Chest [B]
— Stitching pain in left breast [2], during inspiration.
== Pain left side of chest extending to left side of back and left axilla [4].
== Stitching pain in right lung.
= Axillar perspiration, offensive after physical exertion.

Heart [B]
= Sensation as if heart moves around when bending forward.
== Heart beats so violently that it seems to move.

Back [B]
= Pain in nape of neck < turning head; in morning preventing to raise the head. [S]
= Violent pain in nape/ between scapulae [2].
= Nape of neck painful, stiff [2], < motion, > rest.
=■ Shooting, sharp pain in spinal column when bending forward, < inspiration [4].
“ Stiff sensation in spine [3].
■> Pain from lumbar region to foot.

Upper extremities [B]
== Sharp, shooting pain in right shoulder, < motion, > rest.
== Fingers as if swollen.

Lower extremities [B]
=> Soreness legs, especially posterior side thighs [< left side], < bending [3].
« Cramps in both feet, sometimes in one foot only, when bicycling, > moving feet.

NEOTYPHODIUM LOLII **Neoty-1.**

Scientific name	Neotyphodium lolii (Latch, Christensen & Samuels) Glenn, Bacon & Hanlin 1996.
Synonym	Acremonium lolii Latch, Christensen & Samuels 1984.
Teleomorph	Epichloe typhina.
Family	Clavicipitaceae.

KEYS

- Endophytic fungus [lives *within* the host].
- Symbiotic [enhancing host fitness and receiving protection in return] or parasitic [permitting almost no host seed production].
- Infects grasses, predominantly Lolium species.
- Tremors, moves, shakes, and staggers.
- Rock and Roll fungus. “Let’s shake, rattle, and roll.”
- Movement, excitement, noise or disturbance <.
- Reproductive and cardiovascular problems.

FEATURES OF THE GENUS

- Small genus with 8-11 identified species.
- Endophytic microfungi [= living within their host].
- Teleomorphs [sexual reproduction] are classified in Epichloe, anamorphs [asexual reproduction] in Neotyphodium [previously known as Acremonium].
- Endosymbionts of cool-season grasses.
- Because they can enhance host fitness by protection from biotic and abiotic stresses, but can also reduce host seed production, these symbionts span a continuum from antagonistic [highly pathogenic] to mutualistic.
- Produce certain alkaloids that have beneficial effects for the host: increasing drought tolerance, enhancing resistance to certain fungal diseases, and deterring a variety of insect pests from feeding on the grass. In return the fungus gains enhanced nutrition and greater protection against desiccation, predators and parasites. Survival of the host means survival of the guest.
- The mutualistic or antagonistic effects are directly related to the relative importance of their sexual [teleomorph] and asexual [anamorph] life cycles.
- Parasitic, antagonistic species “steal” the energy meant for the inflorescences

and use this to produce their stromata, which grow systemically through the whole plant.

- The sexual cycle of these species occurs only on 'choked' tillers on which no seeds are produced, so the more antagonistic Epichloe species permit almost no host seed production and only transmit horizontally [contagiously].
- Benign, mutualistic species can only spread from infected seeds; they cannot spread from plant to plant in the field. Seed can account for nearly 60% of the total plant lolitrem B in mature plants [Lolium perenne]. The fungus has only a short life [18-24 months] in the seed under normal grain storage conditions. Seed with a high fungus content that is sown in the first autumn after harvest, three months old, will produce pastures with a high proportion of infected plants.

TOXINS

- Several members of the family Clavicipitaceae produce neurotoxins termed *tremorgens,* such as paspalitrems [from Claviceps paspali] and lolitrems [from Neotyphodium lolii]. These indole di terpene alkaloids are active against insects and mammals.

- Members of the related mould genus Penicillium have been also incriminated in producing tremorgenic mycotoxins, the most common being penitrem-A and roquefortine-C.

- Tremorgens, as the word implies, cause muscle tremors.

- Intoxication with these mycotoxins has been documented in humans and in many animals, including cats, dogs, cattle, sheeps, rabbits, poultry, and rodents.

MOVES, SHAKES & STAGGERS

- Neotyphodium lolii completes its life cycle within Lolium species, such as Lolium perenne [Perennial Ryegrass] or Lolium temulentum [Bearded Darnel]. It is transmitted *only by seed.*

The presence of the fungus in the grass may cause the production of either one or both of two classes of alkaloids: lolitrems and ergot-type [ergovaline].

Lolitrem B is primarily found in the leaf sheath, stem, seed head and the seed. This alkaloid causes ryegrass staggers, also known as summer staggers, in livestock.

- Clinical signs include fine muscle tremors that may last for several hours or days. With larger exposures, the tremors can become severe, progress to seizures, and may result in death.

Fine and coarse tremors are exacerbated by movement, excitement, noise or disturbance. Affected animals lose control of their direction of movement. Cattle and sheep usually recover when left alone.

Major problems occur when trying to move affected animals. They have a stiff gait or are unable to walk, and may injure or kill themselves in transit. Other signs that may be seen include vomiting [often preceding the earliest tremors], hyperactivity, nystagmus, opisthotonus, depression, coma, behaviour alterations, tachycardia, and pulmonary oedema.

- Typical manifestations of ryegrass staggers.

In *sheep:* slight tremor of the head and twitching of muscles in neck, shoulder and flank; nodding of the head and jerky limb movements; swaying and staggering; stiff stilted gait, short prancing steps to stiff-legged bounding gait; collapse, extension of head, arching of back, rigid tetanic extension of legs.

In *cattle·,* leg and trunk stiffness causing hesitancy in movement; tendency to fall, stand with legs splayed out; may kneel on forelegs or 'dogsit' on hind legs; collapse, flexion rather than extension of legs.

In *horses:* turn with difficulty, stand with legs splayed out, tendency to fall; reeling drunken gait, move slowly; paralysis of hind quarters; trembling, muscle spasms, hypersensitivity to sudden stimuli.

[Data from Department of Primary Industries, Water & Environment, Hobart, Tasmania.]

REPRODUCTION & VASOCONSTRICTION

• The ergot-type alkaloids produced by Neotyphodium/ Epichloe affect the reproductive system and the cardiovascular system.

• Horses are particularly sensitive to ergovaline and are prone to developing reproductive problems: abortions, difficult births and foal deaths.
Ergovaline intoxication in livestock includes hyperthermia, lower feed intake, weight loss, lower pregnancy rates and decreased milk production. [Ergot alkaloids induce abortion.]
Ergovaline is believed to contribute to heat stress in cattle [high ambient temperature], resulting in symptoms including high rectal temperature, panting, salivating and searching for shade and cool. [Compare the sensitivity to heat of Secale - Claviceps purpurea!]
The levels of ergovaline in grasses invaded by Neotyphodium are low in winter and early spring, to increase with rising temperature and seed head development. The levels fall after reproductive growth and rise again in response to increasing moisture stress. Ergovaline is concentrated in the reproductive parts of the grass plant, especially in the seed heads and seed screenings.

SLEEPYGRASS & DRUNKEN HORSE GRASS

• Clavicipitalean endophytes of grasses are almost exclusively species of Epichloe or anamorphs classified in Neotyphodium.

> On a worldwide basis, several other clavicipitalean endophytes have impacted on humans by causing toxic syndromes in grazing animals. Among these are the sleepygrasses of North and Central America. ... Riders passing through the mountains would permit their horses to graze on the abundant grasses in the area. After consumption of relatively small quantities of the grass, the horses would go to sleep for 2- 3 days, then gradually recover. Recent studies have identified the ergot alkaloid lysergic acid amide as the sleep-inducing agent in sleepygrass.
> In Northwestern China and Mongolia the clavicipitalean endophyte- infected Achnatherum inebrians, or ‘drunken horse grass’ as it is commonly known, has long been a nuisance.

Horses develop ‘staggers’ that make it difficult for them to stand after consumption of the grass. Severely affected horses die within 24 hours of eating the grass. Miles et al. [1996] identified lysergic acid amide and ergonovine as two toxic endophyte-produced components of the grass. ... Under the intense grazing pressure that is occurring currently on Chinese and Mongolian grazing lands, the avoidance of drunken horse grass may provide the selective advantage that is allowing the plant to expand its range.

Populations of the Asian Achnatherum sibericum have also been reported to cause toxicides in animals in certain locations. Neotyphodium endophytes have been demonstrated to occur in this species. In South Africa another grass, ‘dronk grass’ [Melica decumbens], contains a clavicipitalean endophyte that produces symptoms similar to those of ‘dronken horse grass’. In Australia a clavicipitalean endophyte was found to cause a staggers toxicosis in animals that consumed the native grass Echinopogon ovatus. The endophyte Neotyphodium tembladerae is widespread in several grasses of South America. The presence of the endophyte in the Andean grass Festuca hieronymi has been linked with a ‘staggers’ condition called ‘tem- bladera’ in Argentina. Neotyphodium tembladerae produces ergot alkaloids ergovaline and peramine but lolitrems have also been detected. One common name for Poa huecu is ‘huecd’, meaning ‘intoxicator’ in the indigenous Araucanian language that was spoken by tribes that lived in the region. Poa huecu is frequently lethal to animals.

In Argentina, the endophyte Neotyphodium tembladerae has been employed as a weapon of defense against armies or soldiers on horseback. In what has been termed the ‘strategy of huecii’ Indians, soldiers, or bandits fleeing pursuers would purposefully enter zones dominated by P. huecu. Those employing the ‘strategy of huecii’ had the knowledge to prevent their horses from consuming the toxic grasses. However, their pursuers were frequently unfamiliar with huecii grass and would permit feeding by their animals. The rapid intoxication and death of the pursuer’s animals usually permitted escape.

James F. White, Jr. - Biology of Epichloe/Neotyphodium Endophytes; Department Plant Biology & Pathology, Cook College, Rutgers University, New Brunswick, NJ, USA.]

LOLIUM TEMULENTUM **Lol.**

Scientific name	Lolium temulentum.
Common names	Bearded Darnel. Ray grass. Drake. Cheat.
Genus	Lolium.
Family	Gramineae. [Kingdom Plantae]

PLANT

• Common in grain fields and waste places. Widespread in the United States and Canada; introduced from Europe.
Has a prefence for dank fields and often appears in grainfields in high rainfall years.

POISONING

• The Greeks saw the edible grains as "civilized hybrids of inedible avatars," with the grass Lolium temulentum *[aira* in Greek] as the primitive version of barley. Eating *aira* made drunk and dizzy, and eating *tares,* as Lolium is called in the Bible, makes one a fool unable to discriminate between good and evil. Tares is a grass related to wheat, that looks like wheat, and hides out in wheat, but when the ears appear it is different and harmful. "The kingdom of heaven is likened unto a man which sowed good seed in his field. But while men slept, his enemy came and sowed tares among the wheat, and went his way. But when the blade was sprung up, and brought forth fruit, then appeared the tares also." [Matthew 13:24-26]

• Known in Germany as *Taumellolch,* 'stagger lolium,' and in France as *Ivraie,* 'inebriating.' The name *Darnel,* from Old French *dame,* means stupified, as does the specific name *temulentum.* The name *Lolium* was coined by the Romans in reference to a harmful type of grain.
The grass has a great number of folk names, all of which emphasize the plant's drunken-dizzy-making effect.
The plant has long been known for its narcotic-toxic effect. The ancients supposed it to cause blindness, hence with the Romans, *lolio victitare,* to live on Darnel, was a phrase applied to a dimsighted person.

The admixture of the grain with those of the nutritious cereals amongst which it is often found growing should be guarded against, as its properties are generally regarded as deleterious. Gerard tells us: 'the new bread wherein Darnel is eaten hot causeth drunkenness.' ...

Darnel is in some provincial districts known as Cheat, and there is reason to suspect that the old custom of using Darnel to adulterate malt and distilled liquor has not been entirely abandoned.

Culpeper terms it 'a pestilent enemy among the corn,' and in olden days its name was so commonly used as a synonym for a pernicious weed that it has been said that the expression in Matthew 13:25, would have been better translated *Darnel* than *tares.*

The Arabs still give the name *zirwan* to a noxious grass [which is only too common in the cornfields of Palestine] simulating the wheat when undeveloped, though easily distinguishable at 'harvest' time.

It is said that the country people of Cheshire believed Darnel to be 'degenerated wheat.'

The following is a quotation from an old newspaper: ' *The Country of Ill-Will* is the by-name of a district hard by St. Arnaud, in northern France. There tenants, ejected by a landlord, or having ended their tenancy on uncomfortable terms, have been in the habit of spoiling the crop to come by vindictively sowing *tares,* and other coarse strangling weeds, among the wheat, whence had been derived the sinister name of the district. The practice has been made penal, and any man proved to have tampered with any other man's harvest will be dealt with as a criminal.'

Virgil speaks of 'unlucky darnel' and groups it with thistles, thorns, and burs, among the enemies of the husbandman, and Shakespeare says: 'Darnel and all the idle weeds that grow in our sustaining corn.'

In the Middle Ages it was sometimes called Cokil, as well as Ray, and in the 14th century we hear of it being used against 'festour and morsowe,' and of Cokilmeal being thought good for freckles and to make the face white and soft. Culpeper, after calling it 'a malicious part of sullen Saturn,' adds: 'as it is not without some vices, so hath it also many virtues ...

The meal of darnel is very good to stay gangrenes; it also cleanseth the skin of all scurvy, morphews, ringworms, if it be used with salt and reddish [Radish] roots.'

Also: 'a decoction thereof made with water and honey, and the places bathed therewith cures the sciatica,' and finally: 'Darnel meal applied in a poultice draweth forth splinters and broken bones in the flesh.'

[Mrs. Grieve, A Modern Herbal, 1931; reprint ed. 1985.]

• In Turkey and Arabia, Lolium was used as an anaesthetising agent in cataract and bladder operations.
Lolium has been applied as a poultice to arrest pains of a neuralgic and rheumatic character, and in pleurisy.

• The toxic effects have been attributed to the presence of various alkaloids in the plant, eg loline, perloline and temuline. These alkaloids, however, do not appear to be responsible for the toxicity of Lolium temulentum. Loline was found to be non-toxic up to doses of 200 mg/kg [in mice] and perloline is only present in the stems, and not in the seeds.

FUNGUS IN LOLIUM

• There is conclusive evidence that the poisonous properties of Lolium are due to a fungus. In the late 1800s Darnel was discovered to be infected by Neotyphodium endophytes [Guerin, 1898, Sur la presence d'un Champignon dans I'lvraie. J. Bot. 12: 230-238]. A classic paper by Freeman [1903], entitled "The seed-fungus of Lolium temulentum L., the darnel," identified a fungus as the toxic principle in L. temulentum.
This fungus is Neotyphodium lolii. The toxins produced by it accumulate in the seedheads and seeds; the fungus can only spread from infected seeds; poisonings often occurred through the contamination of flour with Lolium seed; the intoxication symptoms of Lolium temulentum are in accordance with the effects observed in animals from eating infected ryegrass.
In addition, in a footnote to the symptoms of Lolium temulentum in Allens Encyclopedia, "Mr. A. S. Wilson, in Transactions of the Edinburgh Botanical Society for 1874, declares that the poisonous properties of the grains of this grass are due to the ergot [Claviceps purpurea] which so commonly infests it, and that when care is taken to select perfectly sound kernels they prove absolutely inert. Note also the cases of poisoning have been more frequently observed in low wet districts and during wet seasons. The symptoms, especially those of paralysis, may be compared with Secale cornutum [Claviceps purpurea]."
Epichloe [Neotyphodium] is in the same family as Claviceps and wet seasons are a well-known cause of increased fungal growth.

The grasses tall fescue [Festuca arundinacea] and perennial ryegrass [Lolium perenne] are important pasture grasses and are frequently infected

by Neotyphodium coenophialum and N. lolii, respectively. The endophytes of these grasses have only recently been recognized as the cause of animal toxicoses.

Among grasses that have a long recorded history of association with toxicoses is 'darnel' [Lolium temulentum], one of the annual ryegrasses. Darnel poisoning has been regional, with toxicoses reported exclusively from Europe, even though endophytes commonly grow in this species on all continents. The regional occurrence of toxicities is common with endophytes. Strain variation is believed responsible for this phenomenon.

[James F. White, Jr. - Biology of Epichloe/Neotyphodium Endophytes]

CLINICAL MANIFESTATIONS

The symptoms produced by Lolium are analogous to those of alcoholic intoxication.

- Apathy and confusion. [C]
- Headache [frontal] and dizziness. [C]
- Disordered vision [sometimes yellow]. [K]
- Dilated pupils; blurred vision; sometimes green vision. [O]
- Piercing stare. [C]
- Lingual paresis. [K]
- Quivering of the lips. [C]
- Tinnitus aurium. [K]
- Dysphagia. [L]
- Hindered speech or loss of speech. [L]
- Pressure in gastric region, followed by cramps. [C]
- Vomiting and diarrhoea. [K]
- Polyuria or difficult micturition. [O]
- Praecordial oppression and anxiety. [K]
- Muscular tremors. [K]
- Staggering and stumbling ['stumbling sickness']. [L]
- Cold perspiration. [K]
- Decreased body temperature. [O]
- Pulse small and irregular. [O]
- Alternate attacks of somnolence and vomiting. [C]
- Deep narcosis, sometimes proving fatal. [K]

[Christison 1855; King's American Dispensatory 1898; Lewin 1928; von Oettingen 1958]

MATERIA MEDICA

Provings

[1] All symptoms in Allens Encyclopedia come from poisonings, by bread containing the flour, soup containing the grains, chewing some of the dry grain, etc.
[2] P. Antze; self-experimentation with tincture in increasing doses; *c.* 1890.
[3] J. Schier; proving with the tincture in increasing doses, 1895; 10 provers [2 females, 8 males], of which 4 male provers exhibited no reaction whatsoever. Three provers took the lx, 2x, 3x or 4x without results.

Affinities

« Central nervous system; spinal cord. Gastrointestinal tract. Cardiovacular system.

DD

«· Compare: Secale [related species]; Lathyrus sativus [paralysis; cramps in calves; < wet seasons]; Opium [somnolence]; Strychninum or strychnine- containing plants, Nux-v. or Ign. [opisthotonus; ataxia; < excitement, noise; etc.]

Self-experimentations

= The following account is reference 11 in Allens Encyclopedia. It concerns a self-experimentation of a prover who mixed a certain amount of Lolium kernels ground into flour with sourdough and who ate the next morning at 7 a.m. some of the bread baked from it. ... Shortly afterwards he experienced: “Absent-mindedness and blurred vision while reading in the garden. He stopped reading, went into the house and tried to write, but the hand refused service; he was dull, mentally slow, and absent-minded.
After returning to the garden at 8 a.m. a kind of torpor, severe nausea, general weakness, blurred vision, dullness; he had to sit down and rest his head on the table. He dozed off, but soon woke up again and made some attempts to vomit; wanting to leave the garden, he had to drag himself along the wall, holding on to it, his gait unsteady, his limbs trembling and unable to hold a glass of warm water brought to him. Vomiting with great effort of some of the bread; feeling of general malaise; so exhausted and weary that he hardly

could speak.

He threw himself fully dressed on the bed and fell asleep, waking up again after a short while to throw up all of the bread eaten some two hours before, mixed with much transparent slime, and leaving him with an unpleasant taste in the mouth. Slept until the afternoon; wanted to rise, but because his condition was about the same he lay down again and slept until 1:30 p.m. He took some soup without appetite and went out for a walk in the fields, but, feeling completely exhausted, lay down in the grass and fell asleep. In the evening, weak and without much appetite; slept during the night less than usual and woke up the next morning almost fully restored, except for having some nauseous feeling in the gastric region and eructations with an unpleasant, very peculiar taste."

Endophytic fungus [lives within the host]. Symbiotic [enhancing host fitness and receiving protection in return] or parasitic [permitting almost no host seed production]. Infects grasses, predominantly Lolium species. Tremors, moves, shakes, and staggers. Rock and Roll fungus. "Let's shake, rattle, and roll." Movement, excitement, noise or disturbance <. Reproductive and cardiovascular problems.

== Antze took an infusion of the plant, extracted in a mixture of water and spirits of wine, beginning with a few drops and gradually increasing the dose to about 5 gr. He noticed the following symptoms. "Dullness in head; pressing frontal headache; vertigo when moving the head; staggering when standing with eyes closed; overpowering drowsiness. ... Pressing sensation in epigastrium and umbilical region; fullness in stomach, nausea and retching, accompanied by exhaustion and cold sweat; vomiting of a yellowish liquid mixed with much slime; later violent stomach cramps, with sensitivity of the stomach for pressure; tongue coated white. ... The gastrointestinal disturbances began with dryness in the mouth and scratching in the throat, thirst and want of appetite, even when no vomiting occurred. Diminished production of saliva.

The stools were initially diarrhoeic, then long and narrow, as with a partial stenosis; later a constipation appeared that persisted for weeks. The diarrhoea and exhaustion were accompanied by anuria, which later changed into polyuria of watery urine. ... Small doses [0,5 - 1 gr.] resulted in a constant feeling of chilliness and made the body temperature within five hours drop from 36.9° C to 35.7° C. After eight hours the body temperature gradually returned to normal, although the subjective chilly feeling remained longer."

[both experiments cited in J. Schier, *Prilfung von Lolium temulentum]*

Mind

= Anxiety and general uneasiness.

« Comprehension difficult; very slow.

= Loss of judgement [due to impaired coordination],

== Talks loudly to herself during the night [feels very nervous and excited; has to rise due to unbearable itching, which is < while lying].

<- Oversensitivenes, persisting for weeks.

Chills when touching velvet, paper, coal, from squeaking of a door, scratching on glass, moving of furniture, etc. [S; first prover]

A strange sensitivity of the nervous system is noticed; when taking a rough piece of paper in his hands, when walking over a rough dirt road, when hearing a labourer rubbing his rough hands, when someone in the train folds up a newspaper, a icy cold sensation runs down from the vertex to the foot soles; he wants to moisten his fingertips constantly. [S; second prover]

Neurological

<= Loss of control of direction of movement.

= Unsteady gait, with trembling of limbs; unable to hold a glass of water.

=> Universal convulsive trembling, with drowsiness, and marked coldness of the limbs.

== Trembling of tongue.

“Awkwardness and trembling of hands [while playing piano], & objective swelling of hands. [S]

Sensory

== Dimness of vision.

== Scintillation before the eyes.

= Impaired hearing [from sensation as if ears were stuffed with cotton wool], appearing and disappearing suddenly.

= Sensation as if the head were stuffed with a thick substance that presses outward through ears and forehead. [S]

<·» Peculiarly altered sense of taste/ smell.

Coffee tastes as if it had been regurgitated from the stomach; likewise with a bean salad and with lettuce prepared with cream. [S]

Energy
= Great weakness. General lassitude. General physical prostration.
~ So weak and exhausted that he can scarcely talk.
= Was obliged to sit down and rest the head on a table.

Sleep
== Drowsiness. Somnolence.
“ Sleep unusually heavy.
“ Peculiar sleepiness; falls asleep as soon as she sits down and closes her eyes. [S]

Temperature
= Great internal chilliness.
“ Cold chills all over, especially in limbs.
= Coldness of the extremities.
“ Icy cold feet. [[S]
“ Cold sweat.
= Heat stress, searching for shade and cool [observed in animals].
= Sensation of gooseflesh in occiput, or sensation as if a lump of ice were lying on nape of neck and occiput. [S]

Appetite
“ Cramping pain in gastric region, [from left to right], when stomach is empty and/or a feeling of hunger occurs, > immediately after eating. [S]
“ Ravenous appetite, soon followed by diarrhoea. [S]
= Yawning, no appetite, but can eat almost as much as normally when he starts eating. [S]
= Appetite increases while eating. [S]
== Loathing of sweetened coffee. [S]
“ Eating > generally and locally [headache and stomach cramps]. [S; two provers]

Modalities
“ Fine and coarse tremors and ataxic symptoms < movement, excitement, noise or disturbance.
= Eating > frontal headache and cramping pain in stomach.

Cardiovascular
= Epistaxis; from right nostril, in morning in bed; blood first dark, then

lighter; > cold compress in nape of neck.
-» Face very red and hot. Face either pale or red and puffy.
» Stitching sensation in heart region and under left scapula, < deep breathing. [S]
= Pulse alternately increased and decreased. [S]

Gastrointestinal
<■> Nausea; retching; vomiting.
= Waking from sleep with some effort to vomit.
= Awakes at night from violent stomach cramps; must bend double; temporarily > placing hand on stomach; < any movement; > discharge of flatus. [S]
=· Vomit mixed with much colourless mucus.
== Pressure in pit of stomach and abdomen.
= Severe colicky pains.
<= Distension of abdomen.
= Diarrhoea or obstinate constipation.
= Gagging/ retching, without nausea, from sneezing. [S]

Vertigo
«· < Motion; walking.
= > Rest; sitting; must keep eyes closed.
= & Staggering gait.
"Sensation at every step that she is moving backward the same distance and is therefore making no progress." [S]
=· & Nausea; loss of speech.

Peculiars
<= Noise in ears, like a constant sound of drums and cymbals.
=> Noise in ears as from "a locomotive standing nearby." [S]
== Feeling of burning in mouth and throat.
» Great pain and tightness in the legs, especially the calves, extending to the ankles, with redness, swelling, and itching of the skin.
== A very characteristic symptom is: Tightness in the calves; violent pain in the calves as if bound with cords. This tightness affects the rest of the legs in less degree. [Clarke]
= Inflammation, redness and swelling of finger joints; sensitive on pressure

and painful on moving fingers; & violent itching, as if stung by insects, with appearance in the evening of pin-head sized vesicles, which itch vio- lendy during the night. [S]
" Lame, paralyzed sensation in knees, < walking. [S]
= Menstruation late and profuse ["double the usual amount of blood; blood dark and clotted"]. [S]

[S] = J. Schier, *Priijung von Lolium temulentum;* Allgemeine Homoopathische Zeitung, 1896, Band 132, No. 13 + 14.

CASES

First case
Dutch homeopathic physician Dick Koster "had treated patient Alice for eight years with only reasonable results, when she reported a new complaint: trembling hands." After giving her Lolium temulentum, based on local symptoms, she reacts beautifully and "for the first time she told me her real story and it beautifully confirmed the remedy."

> *First visit with new remedy [January 1999}*
> Alice is a 42-year-old woman, married with three children and I know her from previous treatment. She now has the complaint: *trembling hands,* alternating with pain in her hands. When her hands are trembling, she can't hold anything and everything falls from her hands. She notices a weakness, like diminished muscular strength in her hands. This weakness has existed somewhat longer.
> Also her feet tremble on driving her car, especially with speeding and she has a restless feeling in her feet. The trembling is stronger after lifting something and when she holds things in her hands. The trembling is better by sitting on her hands. She has always been awkward.
> She has become gloomy with the trembling, because it annoys her when others can see it, like when she directs a gospel choir. When she doesn't have trembling [or has less] she has pain in her fingers, somewhat better by pressing them. I gave her the remedy [Lolium temulentum, 200c, one dose] and saw her again after six weeks.
> *Second visit [February 1999}*
> She now tells me that after five days the trembling became much worse for

a day or two, but after that her hands became more and more quiet. She can do more with her hands and feels herself in a more stable mood. On the other hand she says she has more pain in her hands, maybe due to the fact that she does more with them. Immediately after the remedy she became dyspnoeic for three or four days, a similar dyspnoea she remembers she had after using ergot for her migraines. Further she mentions vertigo, better by closing the eyes and a cold stiffening of her arms and legs, both existing before the last remedy. She didn't have her usual migraines. I gave her the same remedy in 200c as a spare remedy, to be taken if necessary.

Third visit [September 1999]

Seven months later she returned because her migraines have been back for two months and also the trembling of the hands had returned, although less than at the beginning. She has used her spare dose in the meantime. There seems to be a connection now between the two complaints, because she recognises the trembling as a prodromal symptom of her last attack of migraine. This started with trembling [3], stiffness of the neck [2], heaviness of the head, vertigo [< closing eyes] and paralysis of the left side of the face [3]. Even her mouth dropped. She was very sensitive to odours [3] and she smelled a sharp, sweetish smell. During the headache she was nauseous [2] with retching, but hardly any vomiting. She couldn't talk and went to bed, although she had more pain when she tried to relax. Strong pressure somewhat alleviated the pain [2]. Her face was ice-cold and warmth helped [2], She panics easily, is restless and doesn't know what to do because nothing helps and she feels 'powerless' on the left side of her body. The headache came on one day before her menses. Concerning the trembling she mentions that it ameliorates with warm weather.

Her real story, fourth visit

After more than one-and-a-half years, she returned to my office in April 2001. Her headache has appeared lately slighdy more often. She now tells me a new piece of her story, something she didn't until recently dare to tell anybody. Since her childhood she has seen 'things' around people [3], she feels the pain from other people [4] or feels exactly what is the matter with them. She is very sympathetic [3] and a lot of people are dependent upon her, something she experiences as a burden. She is from a quite severely orthodox Protestant background and she has learned, from her childhood onward, to suppress her clairvoyance, because such things were in her circles considered as a possible way of entrance for the devil.

All impressions like the pains from other people enter via her hands, and it almost seems that she uses unconsciously her hands as a sort of divining rod. With these 'impressions' all her energy leaks away and she becomes very tired [3] on the one hand and very hyper and restless on the other. She washes her hands often, hoping that the feelings and tremors will go away and in the past she used to lie down in the grass. The impressions also often circulate in her external throat and she becomes oppressed.
Her dilemma is between doing something with these feelings on the one hand, because she doesn't think they are there 'for nothing' and she might be able to help others. But on the other hand she would like to refrain from them, because of her religion and because she suffers from them. Cutting the feelings short doesn't work, because then she seems to have even less control over them [trembling, migraine?]. It isn't clear to her whether her complaints are due to her internal struggle or her inability to handle the 'information' properly.
... She receives the remedy in 200c and when her headache isn't completely resolved after one month, a MK.

Fifth visit [July 2001]
After three months she returns. ... The headache had already improved with the 200c and disappeared completely after the MK.
According to her the remedy helps her to fence off her clairvoyance. She is quieter in her head; she is less irritable, actually very calm. She trembles only occasionally and doesn't mind about it. Her bowels rumble more and are more active. She used to have slow stools, now rather fast and after motion or after eating she has to go to the toilet. She appreciates that. She feels comfortably calm. Stimuli are felt less violently. She feels a sort of protective layer around her. When I ask her about her dilemmas she says that it is difficult for her to talk about them, but that she likes to talk about them with me in a open-minded setting, like philosophising.
What she really is looking for is a confirmation that she is on the right track, preferably in the form of consent, from someone with authority and whom she can trust. The leader of her training course did mention some 'occult' things about which she has doubts, resulting in him no longer being an absolute source of'truth'. She would like, so to speak, to be able to ask Jesus Christ, who wrestled with the same dilemma [she recognises this, but at the same time she is very modest!]. She is afraid to choose the easy way, because that might be [and often is] the 'wrong' way. A wrong choice hangs above her like a sword of Damocles.

> As a positive change she mentions further that she has learned [although she tries to do her duties] to say no and that she doesn't have to carry the whole world on her shoulders and that she may choose more for her family and thus, indirectly, more for herself.
> [Dick Koster, *Alice;* Homoeopathic Links 2/03]

In an epilogue to the case, Koster makes an attempt to "show that Alice's problems in life and how she has learned to cope with them can be, at least in theory, linked to features discernable from the plant and fungus symbiosis." He mentions the economic importance of grasses and their nondescript nature as individuals since "separate plants grow into a carpet of grass." He compares the usefulness of cereal grasses with Alice's tendency "to take good care of others, seeing herself as less important." The fungal partner of the symbiosis, however, brings in a sensitivity that may complicate matters because "patients who react well to [fungal] remedies have strings or antennae far beyond their natural realm."
And: "Profitable as a symbiosis seems to be, the host [the grass] doesn't give in without a struggle, having to bear a strange entity around her neck and wearing [introducing] a sensitivity she is unused to as a common grass. The advantage in real life of the parasite for the grass is that grass eaters shun the infected grass, so that it can set seed and flourish better. But the price can be social avoidance when people discover her sensitivity, as with her Church group.
As a 'grass' Alice doesn't know any other way to handle people who bejump her than to accept them as symbiotic necessities, unable to shut down her sensitivity and responsibility for others." He concludes with offering "the solution for Lolium patients: being able to turn on and off their sensitivity by free will and take relatively more their responsibility for all the people on their neck."

Second case

• A second Lolium temulentum case is reported by the Dutch homeopathic physician Maja Miedema. It concerns G., a short, heavy-set man aged 44 with the appearance of a 60-year-old. He is very slow and dull, and has tremors of both hands for twelve years due to Parkinson's disease. The tremors started in the left leg, then affected the left arm, the right arm and the right leg. Worse in the right arm and left leg, the tremors aggravate when

the patient is nervous, especially when looked at, from coldness, in the morning, and during hot weather. They disappear during sleep. His co-ordination is most affected on the left side. Walking in a straight line is difficult and he has to hold a cup with both hands and even then will spill most of the contents. The tremors make him tired and sweaty. Has been declared unfit for work twelve years ago and is now house-bound, doing basically nothing and falling asleep at daytime or at inappropriate times, such as when talking with someone or during physiotherapy. This is worse in warm rooms and better outdoors in the cold air.

He answers very slowly, only when asked and then confused. He says that he knows what to say, but the words won't come. He used to live with his parents until they passed away and now lives alone in his parental house, shunning people. "I like to be alone because then no one watches me. When alone I can do something I like myself." When asked about his hobbies, however, it takes him a long time to come up with something. He is very timid, in particular when looked at or with strangers. He has no friends and never has visitors.

Prescription of *Helleborus, Baryta carbonica* and *Opium,* in the course of one year has little or no effect. He then receives *Lolium temulentum* IM, after which the tremors increase and walking becomes virtually impossible in the first week. He perspires heavily and loses two kilos in weight. He notices that the overwhelming drowsiness during daytime is much less and that falling asleep at night has improved. After one year of treatment [with three repetitions of Lolium 1M] his tremors have largely disappeared and with a distinct improvement on the psychological level: more open, easier making contact, more alive, joking, less childish, better concentration.

G. reappears almost 6 years later with a relapse of the tremors since a heart attack some months earlier. Lolium temulentum puts him back on track, although not to the same level prior to the heart condition. On the psychological level, on the other hand, he keeps on improving.

[Maja Miedema; personal communication]

Signatures

• Neotyphodium lives within its host, in particular in the seedheads and seeds. The host offers protection to the fungus, which in return vegetatively invigorates its host. The relationship is beneficial to both, with the additional advantage for the fungus that its lodging in the seeds helps it through

the winter. Whereas other members of the family Clavicipitaceae build themselves a sclerotium as a wintertime residence, Neotyphodium, completely seed-transmitted in its anamorph state, uses its host's seeds to hibernate.
The similarity with the second patient is obvious: "He used to live with his parents until they passed away and now lives alone in his parental house, shunning people."
Another aspect is that Neotyphodium produces ergot alkaloids, mainly ergovaline. Certain ergot alkaloids are used medically in the treatment of Parkinson's disease, the presenting complaint of the second patient. Since several members of the family Clavicipitaceae yield *tremorgenic* indole diterpene alkaloids, this treatment seems almost homeopathic.
Under specific environmental circumstances, however, a conflict of interests arises. The symbiotic relationship becomes antagonistic. This happens when the fungus develops its sexual state, classified as the teleomorph *Epichloe,* which forms creamy yellow sheaths around the stems of its host and also invades its tissues. The leaving home of the fungus goes more or less at the expense of the host. To produce its stromata and eventually its numerous spores, the fungus steals the energy for the inflorescences from the host, thereby choking' it and leaving it sterile. No longer dependent for its reproduction upon the grass, the fungus spreads through sporulation to neighbouring plants.
This delicate balance between symbiosis and antagonism might very well reflect the 'choking' dilemma experienced by Alice, a dilemma that, so to speak, "hangs around her neck." Her supernatural sensitivity, "strings or antennae far beyond their natural realm," clashes with the home base provided by her "quite severe orthodox Protestant background."
In the context of such a 'choking' dilemma, it is remarkable that Alice "immediately after the remedy [Lolium temulentum] became dyspnoeic for three or four days, a similar dyspnoea she remembers she had after using ergot for her migraines." She is stuck with it, hampering free breathing, stealing her energy, in a similar vein as dilemmas in the smut fungus Ustilago tend to express themselves as a knotted sensation in the lower belly.

Hands On, Hands Off

• There appears to be no way to link the signatures of an endophytic fungus, nor of its grassy host, with trembling hands. Yet, the disposition of this fungus and allied clavicipitalean species to produce tremors, universally or locally,

makes an interpretation by means of body language, metaphors and colloquialisms nonetheless very attractive.

Lolium temulentum's predilection for the hands seems beyond doubt, despite the limited number of successful Lolium cases available. This is particularly noticeable in the case of Alice, who has "always been awkward" with her hands, whose clairvoyant impressions enter via her hands and who washes her hands to disclaim responsibility for such impressions. If troubled too much by the trembling, she sits on her hands, just as she does in the psychological sense of taking no action regarding the dilemma between wanting to do something with the impressions and the wish to get rid of them. Rather than handing out what has come to her hands as a natural gift, she perceives it as a hands off command. In looking for a trustworthy source she doubts being in good hands with the leader of her spiritual course. Partly because she "cannot talk about her spiritual interests within her orthodox religious community," she feels handicapped in handling the impressions properly. Altogether she is greatly inconvenienced by the situation, which in Dutch would translate as 'onthand' [being without hands] and in Swedish as 'handfallen' [hands fallen off].

What from a quantitative point of view seemingly leaves us with little more than circumstantial evidence, becomes a different story when considered from the perspective of quality. Quality serves as a handle to understand some aspects of Lolium temulentum.

What strikes me most in Dick Koster's marvellous case is an element I regard as a key issue of fungus-remedies, namely 'Nothing ventured, nothing gained' or, occasionally, the opposite: 'Better safe than sorry'. Leaving the safety of home, whether that concerns the parental house or an institutionalized belief, involves the 'risk' of being rejected by some but brings the advantage of earning the respect of others and what's more, self-respect.

The fungus does something similar. In the anamorph Neotyphodium-state it prefers the safety of home, while it broaden its horizon in the teleomorph Epichloe-state. The latter may result in a degree of sterility for the host, but rarely, if ever, in permanent damage.

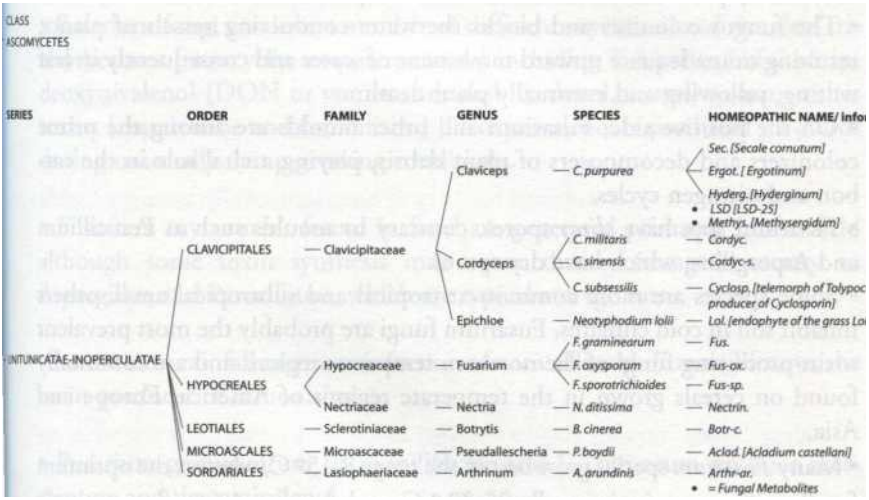
II.ORDER HYPOCREALES

Contains some 550 species in 80 genera.

This order is recognized by its brightly coloured ascomata [structures producing asci, sac-like cells in which usually eight spores are formed] - usually yellow, orange or red.

II A. FAMILY HYPOCREACEAE

Fusarium graminearum
Fusarium oxysporum
Fusarium sporotrichioides



FEATURES OF THE GENUS FUSARIUM

- Genus of rapidly growing *moulds,* containing over 50 species and including both beneficial and pathogenic species, requiring very wet conditions.
- Typical “moisture moulds”; release of spores mainly during rainy or foggy weather.

- The colour of the colony varies from whitish to yellow, brownish, pink, reddish or lilac shades.
- A sclerotium, the organized mass of hyphae that remains dormant during unfavourable conditions, may be observed macroscopically and is usually dark blue in colour. [Purplish black in Claviceps.]
- Most Fusarium species are soil fungi and have a worldwide distribution. Some are plant pathogens causing root and stem rot, vascular wilt or fruit rot. Other species cause storage rot and are important mycotoxin producers. Several species, notably F. oxysporum, F. solani, F. graminearum and F. moniliforme, are recognized as being pathogenic to man and animals causing mycotic keratitis, onychomycosis and hyalohyphomycosis, especially in burn victims and bone marrow transplant patients.
- Fusarium fungi cause wilt disease in over 100 species of crop plants, i.e. cereals, potato, tobacco, tomato, banana, sugar cane, cotton, and flax. Particularly problematic with insufficient crop rotation.
- The fungus colonizes and blocks the water-conducting vessels of plants, resulting in inadequate upward movement of water and consequently in leaf wilting, yellowing and eventually plant death.
- On the positive side, Fusarium and other moulds are among the prime colonizers and decomposers of plant debris, playing a vital role in the carbon and nitrogen cycles.
- Fusarium spp. have *slimy* spores, contrary to moulds such as Penicillium and Aspergillus, which have dry spores.
- Some species are more common at tropical and subtropical areas, others inhabit soil in cold climates. Fusarium fungi are probably the most prevalent toxin-producing fungi of the northern temperate regions and are commonly found on cereals grown in the temperate regions of America, Europe and Asia.
- Many *Fusarium* species grow best in the range 8-15° C, whereas the optimum for *Penicillium* species is usually 25-30 ° C, and that for *Aspergillus* species is often 30-40 ° C. [Kendrick]
- Exposure to dust containing *Fusarium* may result in keratitis, especially in contact lens wearers. [Fisher]

FUSARIUM MYCOTOXINS

History

- The first written description of a Fusarium rot in corn comes from a Spanish friar in Mexico during the 1600s. Fusarium became associated with the rot in stored potatoes by German scientists in the 1850s. In the 1890s, horses, cows, and pigs were reported as losing hair and hooves after eating Fusarium-infected grain in Nebraska.

Fusaria cause diseases, such as ear rot in corn and head blight and scab in wheat, that affect growth and yield of crops and were estimated to cause a loss of a billion dollars to wheat farmers in the USA in 1993. Recently, genetic engineering techniques have been utilized to transfer antifungal genes from plants and microbes into wheat and potato.

Toxins

- Fusarium fungi produce a number of different mycotoxins of the class tri- chothecenes [tetracyclic sesquiterpenoids] including T-2 toxin, HT-2 toxin, deoxynivalenol [DON or vomitoxin], and nivalenol, as well as some other toxins [zearalenone and fumonisins]. Deoxynivalenol is produced on grains during unusually damp growing conditions.

- Fusarium mycotoxins found in food are generated primarily in the field although some toxin synthesis may occur during storage, contrary to Aspergillus and Penicillium, which are typical storage rots.

- Late season rainfall increases infection of corn silk with F. moniliforme, the main producer of fumonisins.

- Fusarium graminearum, F. moniliforme and F. culmorum produce zearalenone and deoxynivalenol.
- F. poae and F. sporotrichioides produce T-2 toxin.
- F. moniliforme and F. proliferatum produce fumonisins.
- F. solani, F. verticilloides [syn. F. moniliforme], and Fusarium oxysporum are, in that order, the three most frequently identified species causing invasive or systemic fusarial infections in humans.

Clinical manifestations

• Human consumption of trichothecene-contaminated foods causes acute symptoms of headaches, chills, severe nausea, vomiting, and visual disturbances, which may last seven to ten days.

• Potential symptoms of overexposure to nivalenol include fever, nausea, vomiting, diarrhoea, leucopenia, bleeding, sepsis, and necrotic lesions of skin and mucosa. [Merck Index, 12* ed.]

• T-2 toxin may be highly irritating to skin and mucous nembranes. Direct contact may cause extensive inflammation and tissue necrosis. Topical exposure has lead to systemic toxicity and death in experimental animals. [Merck Index, 12* ed.]

• After acute administration, deoxynivalenol produces two characteristic toxicological effects: anorexia and vomiting. After short- or long-term administration, one of the most consistent effects observed in most species [livestock and laboratory rodents] is reduced growth. The domestic animal most affected by deoxynivalenol is swine because in monogastric animals, such as swine [and humans], the toxins are available for absorption without interference.

• Fumonisin levels in corn-based foods have been statistically associated with an increased risk of human oesophageal cancer.

• Protective clothing and gas masks offer the only defense against airborne trichothecenes. [This and its haemorrhagic effects suggests comparison with the Ebola virus.]

• Feeding horses, donkeys or mules corn moulded by *Fusarium moniliforme* [the anamorph of Gibberella fujikuroi] may result in a condition called *equine leucoencephalomalacia* ['Hole in the Head' disease]. Initial symptoms consist of apathy, protruding tongue, unwillingness to move backward, and walking in circles, which is followed by blindness, head butting and pressing, constant circling and ataxia. "Eventually the animal becomes delirious and may run full tilt into fences. Finally it falls over, thrashes its legs in the air, and dies. Death may occur in seven hours or several days. A postmortem reveals areas of brain necrosis - large, irregular holes where the white matter has disintegrated." [Kendrick]

- Fusafungine, isolated from Fusarium species, is an antibiotic used as an aerosol for local application.

Occurrence

- "In data submitted to FAO in 2000/2001, deoxynivalenol was found to be a frequent contaminant of cereal grains such as wheat [57% positive], corn [41% positive], oats [68% positive], barley [59% positive], rye [49% positive] and rice [27% positive]. It was also detected in buckwheat, popcorn, sorghum, triticale and in some processed food products such as wheat flour, bread, breakfast cereals, noodles, baby and infant foods, and cooked pancakes. In addition, it has been reported in barley products, malt and beer. The mean concentrations in data sets in which samples containing deoxynivalenol were found were 4-9000 mg/kg for barley, 3-3700 mg/kg for maize, 4-760 mg/kg for oats, 6-5100 mg/kg for rice, 13-240 mg/kg for rye, and 1-5700 mg/kg for wheat. The submitted data showed wide annual variation in the deoxynivalenol concentrations in most of the cereals tested. These results emphasize the need for regular screening for deoxynivalenol in cereal crops. Carry-over of deoxynivalenol to food products of animal origin does not appear to be of concern because animals refuse feed when the mycotoxin is present in high concentrations, and deoxynivalenol undergoes rapid metabolism and elimination in livestock species."[1]

1. T. Kuiper-Goodman - Recent Developments in the Risk Assessment of Deoxynivalenol; Bureau of Chemical Safety, Food Directorate, Health Canada, Ottawa, ON.

FUSARIUM GRAMINEARUM **Fus-gr.**

Scientific name	Fusarium graminearum Schwabe	1839.
Synonyms	Sphaeria zeae Schwein. 1822.	
Teleomorph	Gibberella zeae (Schwein.) Petch	1936.
Family	Hypocreaceae.	

KEYS

- Pathogenic/ parasitic or saprophytic mould.
- Requires wet and cool weather.
- Release of spores typically during rainy or foggy weather.
- Growth stimulant; too rapid growth.
- Conversion of female into male.
- Oestrogenic syndrome.

FEATURES

- Mould developing a pinkish mycelium on corn cobs stored wet over winter.
- Wet and cool weather during flowering of wheat is conducive to infection with F. graminearum which produces DON.

PROTEIN

- This fungus is used for the commercial production of high-protein food.

Many filamentous fungi do not produce large fruit bodies, but can grow on cheap substrates, and produce large amounts of mycelia high in protein. In Britain, a strain of *Fusarium graminearum,* the conidial anamorph of *Gibberella zeae,* is being grown in submerged culture in 1,300-litre fermentors on glucose syrup and ammonia. The dried mycelium has 45% protein of acceptable amino acid composition, 10%—15% fat and 20%- 25% fibre. The nucleic acid content starts out at a gout-inducing 10%, but is reduced to an acceptable 1 % by heating the mycelium to 64° C for 20 minutes. This inactivates proteolytic enzymes, but allows the organism's own ribonucleases to break down the nucleic acids to products that can be washed out of the cells. Successful feeding trials on animals and volunteer humans have led to

commercial production of this high-protein food, which is sold in various forms, under the name 'Quorn,' flavoured and textured to resemble traditional foods.

[Kendrick 2000]

GROWTH

• As plant pathogens Fusarium species cause damping-off in seedlings, a disease encouraged by cold wet soil and crowded conditions. The germinating seed rots before breaking through the soil surface or the seedling rots at soil level, collapses and dies.

• Fusarium graminearum is the anamorph [asexual stage] of Gibberella zeae. A member of this genus [Gibberella fujikuroi] causes a disease of rice called 'foolish seedling' in which seedlings grow too rapidly, are spindly, palecoloured, and sickly, and consequently fall over. The too rapid growth is characterised by excessive elongation of shoots and leaves. The active principle is the plant growth stimulant gibberellic acid, which increases cell *expansion* by influencing cell-wall expansibility.
Gibberelic acid can overcome certain forms of genetic *dwarfism.* Gibberellic acid is the gibberellin most widely used in experiments.

> Gibberellins have also been found to break dormancy in buds and seeds that normally have a light or chilling requirement. They can also partly or completely replace the photoperiod or cold requirement necessary to some species for flowering. Gibberellin levels are high in young leaves and, if applied to ageing leaves, can delay senescence. Levels are also high in developing seeds and fruits.
> [Elizabeth Tootill - The Penguin Dictionary of Botany]

Since the discovery of gibberellic acid in Gibberella fujikuroi, more than 80 gibberellins have been isolated from many species of higher plants. It is now generally believed that they probably occur in all plants, with the highest concentrations being found in immature seeds. Gibberellic acid is readily extracted from fungal cultures and is the most common commercially available form. Large amounts of gibberellic acid are applied annually to such grape varieties as the Thompson Seedless.

Treatment causes larger fruit size and a much looser appearance of the clusters of grapes.

SEX

• Intriguing properties of gibberellin include *parthenocarpy* [a sort of immaculate conception in plants; from Gr *parthenos,* a virgin, and *karpos,* a fruit] and conversion of female into male [flowers].

> Gibberellin applications can induce parthenocarpy [production of fruit without preliminary act of fertilization] and this has been put to commercial use in the production of seedless varieties of fruit [grapes, apples, currants, cucumbers, and eggplants]. ... Application of gibberellin can induce the formation of *male* flowers. This effect has been put to use in the cucumber industry where certain hybrid varieties are naturally gynoecious [having female flowers]. Gynoecious plants usually have low levels of gibberellin. Since pollen production is necessary for fruit set some of the plants are sprayed with gibberellin to produce the necessary male flowers.
> [Elizabeth Tootill - The Penguin Dictionary of Botany]

OESTROGENIC SYNDROME

• Gibberellic acid is a terpenoid synthesized from mevalonic acid, the precursor in the formation of terpenoids and steroids.

• Fusarium graminearum, growing on feed corn, produces the steroid [mycoestrogen] *zearalenone,* which causes *oestrogenic syndrome* in young female pigs. In male swine it evokes feminization - atrophy of the testes and enlargement of the mammary glands.

> Pig farmers sometimes find that their young female pigs [gilts'] develop swelling of the vulva, enlargement of mammary glands, enlargement of the uterus, and sometimes even rectal and vaginal prolapse. Internally, the ovaries atrophy. At the same time, the testes of young male pigs shrivel, and their mammary glands enlarge. Since all of these symptoms affect primary and secondary sexual characteristics, the involvement of some kind of sex hormone might be suspected. Once characterized, the syndrome was quickly linked with the presence of mouldy corn in the feed,

and the fungus concerned was found to be the hyphomycete, *Fusarium graminearum.* The toxin was named zearalenone. It obviously has many of the properties of oestrogen, one of the principle female sex hormones [it actually seems to be involved in regulating the development of sexual fructifications of the fungus]. The toxin doesn't usually kill the animal, but complications following rectovaginal prolapse sometimes cause the whole herd to be destroyed. Lower levels of exposure are also serious in pigs, because they can cause infertility, small litters, and stillbirths. ... Zearalenone is not inevitably detrimental: when added to feed in very low doses, its hormonal properties produce accelerated growth in cattle and sheep, and it has been patented as a feed supplement [but not for pigs]. It has also been used to treat post-menopausal syndrome in humans, and as an oral contraceptive.
[Kendrick 2000]

• Infertility, reduced milk production, and hyperoestrogenism in cows have been reported in association with zearalenone. Virgin dairy heifers fed 250mg of purified zearalenone for three oestrous cycles had an average conception rate of 62%, compared with 87% in control heifers. Prolonged, skipped, or irregular heats are commonly associated with zearalenone effects. Consumption of fodder with high zearalenone levels resulted in a herd of 20 cows in anoestrus, false oestrus, or nymphomania with a grey vaginal discharge. Mammary gland enlargement, swollen vulvas, and vaginitis are frequently observed more often in heifers as compared to cows.

Pathogenic/parasitic o> saprophytic mould.
Requires wet and cool weather.
Release of spores typically during rainy or foggy weather.
Growth stimulant; too rapid growth.
Conversion of female into male.
Oestrogenic syndrome.

[Zearalenone] looks like extra oestrogen to the body. Does it affect humans the same way? Are high oestrogen levels a problem for us? I find nearly every breast cancer case shows a too-high oestrogen level *for years before* the cancer is found! It starts females maturing too early, too. It could cause PMS, ovarian cysts and infertility. Not everybody gets all of these effects. And what is the effect on men and boys of eating an oestrogen-like mycotoxin in their daily diet? This female hormone could have a drastic effect on the maturing process even in small amounts.
Zearalenone and aflatoxin both have immune lowering effects. Zearalenone can induce thymic atrophy and macrophage activation. If you have low immunity [low T-cells, low white blood cell count, and so

forth], immediately go off mouldy food suspects.

Zearalenone is the mycotoxin that prevents you from detoxifying benzene. Every AIDS sufferer I see has a crippled ability to detoxify benzene; they also have zearalenone!

The main zearalenone sources I have found so far are popcorn, corn chips, and brown rice. But it was absent in fresh corn, canned corn, corn tortillas, and white rice, making me wonder how it gets in our processed corn products.

[H.R. Clark 1995]

SIMILARITIES TO DES [Diethylstilbesterol]

• It has been suggested that zearalenone might add to the oestrogen load of humans. Zearalenone has been implicated in several incidents of precocious pubertal changes in children in Eastern Europe. Oestrogens are largely responsible for the change that take place at puberty in girls, "and they go a long way toward accounting for that intangible attribute called feminity," as Goodman and Gilman put it. Oestrogen directly causes the growth and development of vagina, uterus, fallopian tubes, and breasts, and indirectly contributes to "moulding the body contours, shaping the skeleton, softening the skin, and bringing about changes that condition the puberal spurt in growth." In the menopause a slow decline in the secretion of oestrogen takes place, which may lead to postmenopausal syndrome. This syndrome was at one time treated with zearalenone.

Symptomatically, oestrogen overload as caused by zearalenone is similar to the complications resulting from the use of diethylstilbesterol, better known as DES, the disastrous history of which is briefly described by Porter: "Beginning in the early 1940s, the synthetic oestrogen diethylstilbesterol was given to women to prevent miscarriage and subsequently to prevent pregnancy. Some early studies showed that it was ineffective and, moreover, caused foetal abnormalities in animals, but these findings were ignored. Even after 1971, when it was discovered that DES caused a rare form of vaginal cancer [clear cell adenocarcinoma] as well as other reproductive problems in 'DES daughters', it continued to be prescribed in the United States as a 'morning-after' pill. It was also used as a growth stimulant in livestock and, despite being known as carcinogenic from the 1960s, the influential US agricultural lobby stood behind DES."

Aside from “building strong, healthy babies,” as DES was proclaimed to do, the drug was prescribed for a wide range of treatments, including prostate cancer, breast cancer, acne, infertility, menstrual problems, gonorrhoea, menopause symptoms, lactation suppression after pregnancy, morning-after- pill on college campuses, height growth inhibition in teenage girls, to prepare transsexuals for sex change, to fatten livestock.

• Anorexia, abdominal pain, diarrhoea, dysuria, skin rashes, paraesthesias, peripheral oedema, breast tenderness, and enlargement of breasts have been reported as side-effects of DES, but possibly much more severe are the aftereffects. When given during the first five months of pregnancy, DES has been found to interfere with the development of the reproductive system in the foetus. A 1980 study of DES-exposed and unexposed daughters participating in the National Cooperative Diethylstilbestrol Adenosis Study [DESAD] found that fertility did not differ between the two groups. However, this study found an increased risk of premature births, miscarriage, and ectopic pregnancy associated with DES exposure. Women exposed to DES in utero reportedly may have such symptoms as vaginal spotting; abnormal vaginal bleeding; bleeding or spotting after intercourse; abnormal vaginal discharge; painful intercourse; and unsuccessful penile penetration during the first sexual encounter.

• Epididymal cysts are the most common abnormality in DES sons. There is also some evidence that DES-exposed sons may have testicular abnormalities, such as undescended testicles or abnormally small testicles. An abnormally small penis [microphallus] occurs more often in DES sons than in other men. Some researchers have recognized the potential that DES exposure in males may be a factor in the formation of ambiguous genitalia as well as other conditions associated with intersexuality and gender dysphoria in males.
Studies of the psychological effects of DES exposure are limited, but evidence has been found that DES is linked with increased likelihood of various psychological and neurological impairments. This includes Anxiety, Major Depressive Disorder, and other mood disorders. Other studies have recognized the potential for disturbances in psychosexual development and gender identity formation. Some of these conditions may be caused by longterm hormone imbalances induced by prenatal DES exposure. [Data from DES Sons Network]

• DES is now sometimes prescribed in the U.S. as a palliative treatment of inoperable metastatic prostatic carcinoma and postmenopausal inoperable, progressing breast cancer. In many developing countries it is still used for a variety of reasons [suppression of lactation, menopausal symptoms, etc.].

FUSARIUM OXYSPORUM **Fus-ox.**

Scientific name Fusarium oxysporum Schlecht 1824.
Synonyms Fusarium bulbigenum Cooke & Massee 1887.
Fusarium dianthi Prill. & Delacr. 1899.
Fusarium tracheiphilum E.E Sm. 1899.
Fusarium orthoceras Appel & Wollenw. 1910.
Fusarium conglutinans Wollenw. 1913.
Fusarium angustum Sherb. 1915.
Fusarium bostrycoides Wollenw. & Reinking 1925.
Family Hypocreaceae.

KEYS

- Pathogenic/ parasitic or saprophytic mould.
- Causes wilt in crop plants [loss of turgidity and collapse of leaves].
- Requires very wet conditions.
- Release of spores typically during rainy or foggy weather.
- Requires calcium.
- Bio-bombing.
- Colonizer of burned skin.
- Predilection for blood vessels and skin.

PARASITE

• Facultative parasite that can live either saprobically [feeding on dead or decaying organic matter] or parasitically due to the fact that it must survive between growing seasons as a member of the normal soil fungi.
"This ability makes it particularly difficult to control, and virtually impossible to eradicate: *Fusarium oxysporum* var. *cubense,* which causes Panama disease of bananas, can survive in the soil for at least forty years in the absence of the host." [Kendrick]

REQUIREMENTS

• Whether calcium is essential for all fungi is still a controversial question. "Young and Bennett [1922] concluded that calcium is generally beneficial in

the growth of most fungi and is certainly required by *Fusarium oxysporum, Rhizopus nigricans,* and *Aspergillus niger*. ... Zinc is the element of first choice in studies dealing with the mineral nutrition of fungi. ... Zinc does not uniformly influence conidial production in the same manner in all fungi. Roberg and Porges found that zinc inhibits sporulation of *A. niger*. Zinc represses sporulation of *Trichoderma koningii* but stimulates conidial production by *Fusarium oxydatum*. ... Although mycelial growth is dependent primarily on zinc and to a lesser degree on iron and copper, it is essential that each of these heavy metals be present to produce normal colours in a particular fungus. The profound effect which zinc exercises on the growth and sporulation of fungi is an index of the influence which this element exerts on digestive and respiratory activities." [Wolf & Wolf]

FUSARIOSIS

• E solani, E verticilloides [syn. E moniliforme], and Fusarium oxysporum are, in that order, the three most frequently identified species causing invasive or systemic fusarial infections in humans.

Trauma

• Infections due to Fusarium spp. are collectively referred to as fusariosis. The most virulent Fusarium species is Fusarium solani. Trauma is the major predisposing factor for development of cutaneous infections due to Fusarium strains. There have been several reported cases of
Fusarium osteomyelitis and septic arthritis, four of these infections occurring after a motor vehicle accident and one after a penetrating thorn injury. Some Fusarium species are common colonizers of burned skin.

Symptoms

• High fever [unresponsive to antibiotics], keratitis, endophthalmitis, otitis media, onychomycosis, cutaneous infections particularly of burn wounds, mycetoma, sinusitis, pulmonary infections, endocarditis, peritonitis, central venous catheter infections, septic arthritis, disseminated infections, and fungemia due to Fusarium spp. have been reported.

Disseminated infection

• Disseminated infections are similar to disseminated aspergillosis, however

fungemia [fungal infection disseminated by way of the bloodstream] and ulcerated skin lesions are often more pronounced. Skin involvement occurs in at least 70% of patients with disseminated
Fusarium infections sometimes as the source of entry, but more commonly as a metastatic focus.
Similar to the agents of mucormycosis and aspergillosis, Fusarium species have a propensity for vascular invasion and cause thrombosis with tissue necrosis.
Sites of disseminated infection also have included the lung [26%], sinuses [13%], spleen [11 %], kidney [10%], muscle [8%], CNS [6%], as well as the liver, heart, catheter, eye, joint, toenail.
Facial/periorbital cellulitis occurs as a concomitant of fusarial sinusitis.

- Invasive forms are often fatal.

- Clinical manifestations of hyalohyphomycosis caused by Fusarium include cutaneous and subcutaneous infections, endophthalmitis, osteomyelitis, and arthritis. Circumstances for hyalohyphomycosis usually involve a decrease in body resistance due to surgery, indwelling catheters, steroid therapy, or immunosuppressive drugs or cytotoxins.

- Fusarium is one of the most drug-resistant fungi.

Members of the genus Fusarium are ubiquitous fungi uncommonly associated with infection. Human infection usually occurs as a result of inoculation of the organism through the body surface, thus causing skin infection, onychomycosis, keratitis, endophthalmitis and arthritis. Fusarium is one of the fungi that can produce mycetoma [Madura or fungous foot]. Dissemination may occur in subjects with underlying immunodeficiency. Disseminated fusariosis typically occurs in neutropenic hosts and carries a high mortality rate. Characteristically, a profoundly neutropenic patient has had the abrupt onset of fever, sometimes with myalgia, followed in *66* percent of cases by distinctive skin lesions: multiple sites, predominantly on the extremities, develop painful erythematous macules or papules. Central pallor is followed by necrosis and ulceration.
Blood cultures have been positive in 59 percent of cases, including a few that seemed to be due to infected central venous catheters. Amphotericin B

is the drug of choice, although it appears to be poor correlation between in vitro susceptibility and clinical response. Prognosis is poor, with a mortality of 76% in the 85 reported cases. Survival was related to the resolution of the neutropenia.

[Washington University Infectious Diseases Division, Fusarium handouts, Fusarium infections, July 1995]

FORMA SPECIALIS AND BIO-BOMBING

• Some Fusaria previously regarded as distinct species are now viewed as varieties or races [formae specialis] of *Fusarium oxysporum. Fusarium oxysporum* f.sp. *cepae* attacks onions and causes bulb rot. *Fusarium oxysporum* f. sp. *lycopersici* targets tomatoes, *F. oxysporum* f. sp. *vasinfectum* cotton, *F. oxysporum* f. sp. *Uni* f lax, and *F. oxysporum* var. *cubense* bananas.

[f. sp. = forma specialis, or physiological race, referring to populations that are physiologically distinct but morphologically indistinguishable from other members of the species; many fungi have large numbers of physiological races, reflecting considerable genetic diversity and adaptability.]

Pathogenic/parasitic or saprophytic mould. Causes wilt in crop plants [loss of turgidity and collapse of leaves]. Requires very wet conditions. Release of spores typically during rainy or f°W weather. Requires calcium. Bio-bombing. Colonizer of burned skin. Predilection for blood vessels and skin.

• *Fusarium oxysporum* f.sp. *erythroxyli* attacks the coca plant and is a "coca-killing" forma specialis known as EN-4. EN-4 is supposed to specifically target the coca-producing species Arythroxylum wovogranatense, as a kind of biological precision bombing. Promoters of mycoherbicides claim that a forma specialis is so specialized that it only attacks a certain species. This would suggest that it can be controlled, aside from ethical issues of violating territorial boundaries of drug-producing countries by unleashing tons of Fusarium on them. By DNA sequence encoding - "alteration of the gene expression" - Fusarium oxysporum can be "successfully transformed" and finely tuned to obediently have "limited environmental impact." Developmental pathways in fungi, however, allow application of rules that allow great variability in expression. Fungi can vary the timing, extent, and mode of differentiation in response to external signals. They can adjust their physiology without altering morphologically. Their genetic variability includes a pronounced ability to mutate; allowing a forma specialis to alter hosts if it runs out of the host it is programmed to target.

It simply becomes another forma specialis, gets another name, but it is still the same organism, just attacking a different plant. Imagine what it will do to ecosystems and foodchains if released in massive amounts. Moreover, another rule of thumb in mycology has it, says American mycologist Jeremy Bigwood, that the more fungal material is applied, the greater the level of mutation. Although “most mutations go nowhere - they are dead-ends, it is only the 1% that are aggressive that need concern us.” It is not in the nature of fungi, or any other life-form for that matter, to cease to exist after fulfilling the mission imposed upon it. So much for employing pathogenic fungi selectively to control others.

FUSARIUM SPOROTRICHIOIDES **Fus-sp.**

Scientific name Fusarium sporotrichioides Sherb. 1915.
Synonyms Sporotrichella rosea P. Karsten 1887.
Fusarium tricinctum.
Family Hypocreaceae.

KEYS

- Pathogenic/ parasitic or saprophytic mould.
- Contaminates cereals.
- Favours wet and cool weather.
- Produces toxins that are heat- and ultraviolet light-stable.
- Haemorrhages.
- Neurotoxicity.
- Radiation poisoning. Chemotherapy.

FUSARIUM MYCOTOXICOSIS

- Swine administered cultures of F. sporotrichioides by stomach tube developed an ulcerous necrotic alteration of the snout, lips, mucous membrane of the mouth, progressive weakness, depression and emaciation accompanied by mucous secretion from the nose. Death ultimately resulted; some animals died within 7 1/2 hours after intubation. [FAO, 1979]

- Once the fungus is established, a period of fairly low temperatures, or a succession of periods of fairly low temperature, as is common in late winter and early spring in many regions, will result in production of toxins. The toxins in Fusarium-affected cereals are not destroyed by cooking and baking. Trichothecenes are heat- and ultraviolet light-stable.

> In Russia, in addition to ergotism and paspalum staggers [ergotism of grasses of the genus Paspalum caused by Claviceps paspali and induced in cattle, sheep, and horses; characterized by trembling of the muscles and definite ataxia if moved, and uncoordinated movement when frightened, resulting in their falling over in curious attitudes], a series of mycotoxicoses associated with mouldy cereals and fodder have attracted attention for more than a century. During the 1860s Kashin-Beck [or Urov] disease [a

disease of childhood characterized by a chronic disabling, degenerative, generalized osteoarthritis'] was prevalent among the Cossacks and later established as endemic in both Asiatic and European Russia and the northern parts of China and Korea.

Incidence of this disorder was said to have been reduced by importing wholesome grain into the affected areas. The same, or a very similar myco- toxicosis characterized by the 'drunken [or intoxicating] bread syndrome' was, in 1916, the subject of a book by the famous Russian mycologist and plant pathologist N.A. Naumov [1888-1959] who identified the causal fungi as *Gibberella saubinetii* [syn. *G. zeae*\ and *Fusarium subulatum.* Eating bread made from infected cereals caused headache, general weakness, nausea, and vomiting.

A now well established mycotoxicosis is *alimentary toxic aleukia* [ATA] or septic angina, a widespread haemorrhagic disease in Russia. Known before the First World War, it attained epidemic proportions during the Second, especially in the Orenburg district [around the Caspian Sea] where in 1944 more than 10% of the population was affected and a special regional laboratory was established to study all aspects of ATA. In the affected districts it was common practice to allow the ripe cereals [wheat, barley, rye, oats, prosomillet [Panicum supp.] and buckwheat *[Fagopyrum esculentum}* to overwinter under the snow cover and to postpone harvesting until spring.

This encouraged fungal infection of the grain, especially when the snow cover was exceptionally deep so that the underlying soil did not freeze to its usual depth, and when the spring was warm resulting in frequent thawing and freezing. The symptoms which appear two or three weeks after eating toxic grain, include a haemorrhagic skin rash, bleeding from the nose and throat, exhaustion of the bone marrow and death may occur a month or so later. [Also: nausea, vomiting, haemorrages in many organs, bloody diarrhoea, low leucocyte count, throat sepsis and necrosis]. The toxin responsible was first experimentally shown to be produced by *Fusarium sporotrichioides* and *F. poae* but later a number of other fungi isolated from overwintered grain were found to produce toxins, those mainly responsible for ATA being trichothecenes.

[Ainsworth 2002]

In the autumn of 1954, in the wheat field in the suburbs of Tokyo, where *Gibberella saubinetii* had been detected in the spring, the same fungus was detected among the field rice plants growing the same field. At that time,

twenty-five villagers ate the mouldy rice and suffered from nausea, vomiting, drowsiness, vertigo and headache. The isolated fungus was identified as *Fusarium roseum* [syn. *F. graminearum].* The inoculated rice showed a high fatality, sixteen out of sixteen, within 15 days. General depression, loss of body weight, and decreased temperature were seen, and autopsy revealed haemorrhage in the fat tissue, especially around the testes, and cell infiltration and congestion in the lung and liver.
[Raskova 1971]

ALIMENTARY TOXIC ALEUKIA

• In addition to the frequent poisoning due to overwintered mouldy corn observed in the Amur district in eastern Siberia, noticeable incidents of severe poisoning were frequently reported from 1941 to 1945 in western Siberia. The poisoning was diagnosed as aplastic anaemia, haemorrhagic aleukia, agranulocytosis, septic angina, alimentary mycotoxicosis, or alimentary haemorrhagic aleukia, but finally alimentary toxic aleukia [ATA] was adopted as the diagnostic name in 1953. [Aleukia is the now obsolete name for thrombocytopenia.]
Screening of the toxic fungi and examination of the conditions of toxic metabolic yield resulted in the isolation of *Fusarium poae, F. sporotrichioides, Cladosporium epiphyllum* and *Alternaria tenuis.* It was found that these toxic fungi gave a higher yield of toxin when cultured at a lower temperature [0- 5° C] than at a higher temperature [23-25° C]. [Raskova]
People on a monotonous cereal diet, low in proteins, were especially susceptible to ATA.
The principal causal agent in ATA is T-2 toxin.

• The features of ATA are similar to radiation poisoning.

Symptoms of ATA
[Adapted from: Matossian 1989]

EARLY SYMPTOMS

Mild cases
• Headaches.
• Listlessness.

- Chill.
- Fleeting pains in back, joints, sides, etc.
- Nausea.
- Vomiting.
- Copperish taste or pepperish smart in oral cavity.
- Burning sensation from mouth to stomach.

Severe cases
- Diarrhoea.
- Profuse sweating.
- Fluttering, weak pulse.

ACUTE PHASE

Mild cases
- Tonsils and uvula painfully inflamed and swollen; possible presence of white specks.
- Putrid smell about the patient.
- Stool dark and very foetid.
- Skin eruptions: red flush, miliary eruptions.

Serious cases
- Widespread swelling and necrosis in the oral cavity, with difficulty in swallowing and a putrid breath.
- Necrosis spreads into the larynx, vocal cords, lungs, stomach, and bowels.
- Skin eruptions of dark red colour with large, distinct, pale pustules and sometimes purpuric spots, which tended to spread with the least scratch or trauma.
- Haemorrhagic syndrome begins with petechial haemorrhage on the skin, axilliary and inguinal areas, arms, thighs, face, and head.
- Bleeding from the nose, mouth, and vagina; bloody urine and stool.
- Possible swelling of the glands in the neck, armpits, and groin; swelling of the neck glands together with swelling in oral cavity might cause strangulation.
- Abnormal appearance of blood.
- Vomiting, diarrhoea, profuse sweating.
- Fever.
- Pulmonary complications.

• Central nervous system disorders: delirium, stupor, convulsions, depression, disorientation.
• Meningeal haemorrhage.

The visible skin haemorrhages are preceded by nervous system disturbances: irritation, weakness, fatigue, vertigo, palpitation, headache, and slight asthma.

> There are a number of reasons for believing that in the past ATA was often mistaken for an infectious and contagious disease. Like infectious disease, ATA was familial in character and caused fever in its victims. But in other respects ATA does not resemble infectious diseases. Its victims may suffer relapses, especially if they are re-exposed to the toxin. Nursing infants and those on a milk diet are not vulnerable, because a sick human mother or a cow does not secrete in her milk T-2 toxin, the principal causal agent of ATA.
> And unlike tick- and louse-borne relapsing fever, ATA is characterized by throat ulcerations and other necroses resulting from opportunistic infections. Because of these symptoms of the throat, ATA was sometimes confused with diphtheria, or diphtheria mixed with scarlatina, but in cases of diphtheria a false membrane forms in the throat, there is no bleeding, and in temperate climates there is no skin eruption. Today scarlatina is thought to be characterized by fever, skin eruptions, and sore throat, but not by an ulcerated throat or bleeding.
> ATA may also be confused with scurvy, but scurvy does not affect the throat. ATA is similar to pellagra in its timing [spring and early summer] and some of its symptoms - skin eruptions, diarrhoea, and mental disturbances. But ulcerations of the throat and haemorrhagic symptoms are not associated with pellagra. In recent years sporadic cases of ATA may have been diagnosed as aplastic anaemia or agranulocytosis of unknown aetiology.
> The toxin remains in undistilled alcoholic beverages, such as beer brewed from infected grain, but not in rye whiskey. Consequently, epidemics may continue over many months until the grain and its products are consumed or discarded.
> The toxin starts forming in grain in the fall but reaches peak toxicity in spring. Its formation is favoured by a winter with a temperature in the 10 °-15 ^{0}

C range, with abundant snow and alternate freezing and thawing. It was thought that maximum toxin formation occurred at temperatures between 5° and 14° C, but recently it was reported that a *Fusarium* strain from South Africa produced a large amount at 25° C. Sharp fluctuations in temperature serve to increase toxicity. There is no relationship between the rate of growth of the fungi and the toxicity of the grain. Long after the fungi disappear, the toxin remains - up to seven years after the grain harvest. [Matossian 1989]

YELLOW RAIN

• During the early 1980s there was concern that trichothecenes were used in chemical warfare under the name 'Yellow Rain, a claim that has been highly contested by experts. United Nations Special Commission inspectors have established the presence of trichothecenes [and other CBW agents] in Iraqi facilities. The use of such toxins has been pushed as mycoherbicides against drug-crop-producing countries such as Colombia and Afghanistan. It is a small step from "biocontrol" to "biowarfare."

During the Vietnam War the U.S. government received many reports of chemical attacks launched by the invading Vietnamese in Laos and Kampuchea against troops and the civilian Hmong people. According to the reports, victims were sprayed with yellow rain, an aerosol containing substances with toxic effects that did not match those of any known agents of chemical warfare.

Eventually it was recognized that the symptoms - prolonged vomiting, diarrhoea, headaches and dizziness, respiratory problems, blisters, internal haemorrhages, sometimes culminating in death - were like those produced by the trichothecenes. Samples of blood, urine and body tissues from victims, and leaves, water and soil from sprayed areas were found to contain several trichothecenes and zearalenone, typical *Fusarium* toxins. Control samples, including cereal grains, from areas adjacent to the places were attacks had taken place, contained no *Fusarium* toxins.

However, this issue was clouded by the remoteness of the location, and the unsatisfactory and inconclusive nature of the available evidence. Samples of the 'yellow rain deposits were later shown to be largely made up of pollen. [Kendrick 2000]

CLINICAL MANIFESTATIONS

• The clinical manifestations of trichothecene intoxication include nausea, vomiting, seizures, central nervous system dysfunction, chills, fever, hypothermia, hypotension, epithelial necrosis, myelosuppression, and gastroenteritis with haematemesis and melena [bloody vomiting and stools]. Hallucinations are a distinctive feature of trichothecene intoxications.

In the yellow rain attacks, vomiting was induced and lasted several days. There was a feeling of intense heat, itching and burning of the skin, dizziness, tachycardia, chest pain, headache, and decreased vision. Within hours, victims reported intense eye pain, red eyes, bleeding gums, and haematemesis. Trembling was common, and some patients had seizures. Severe itching ensued with the formation of small hard blisters, some of which were haemorrhagic, occasionally progressing to large bullae. Abdominal pain and bloody diarrhea continued.

Victims of yellow rain reported a variety of upper respiratory signs and symptoms.The major subdivisions of the respiratory tract that were affected include the nose [itching, pain, rhinorrhoea, and epistaxis]; the throat [sore/pain, aphonia, and voice change]; and the tracheobronchial tree [cough, haemoptysis, dyspnoea, and deep chest pain or pressure or both]. Agricultural workers who were exposed to hay or hay dust contaminated with trichothecene mycotoxins developed similar signs and symptoms of upper respiratory injury.

Fifty yellow rain survivors reported the following:

- Smell of gunpowder or pepper [14%].
- Eye pain and burning [68%]; lachrymation [47%].
- Blurred vision [58%].
- Nasal discharge [28%]; nasal itching [14%].
- Sore throat [40%].
- Aphonia [26%].
- Cough [60%].
- Dyspnoea [52%]; severe [crushing] chest pain [52%]; and hemoptysis [18%].
- Persistent burning sensations, with tingling, itching, and pain lasting several hours.
- Blisters [23%].

• The features of trichothecene intoxication are similar to radiation poisoning [chemotherapy]: neurotoxicity, with somnolence, confusion, tremors, depression, weakness, malaise, and memory problems.
[from: http://www.themoldsource.com/mold/toxins.html]

Pathogenic/ parasitic or saprophytic mould.
Contaminates cereals.
Favours wet and cool weather.
Produces toxins that are heat- and ultraviolet light-stable. Haemorrhages.
Neurotoxicity.
Radiation poisoning.
Chemotherapy.

II B. FAMILY NECTRIACEAE

Nectria ditissima

NECTRIANINUM **Nectrin.**

Latin name	Nectria ditissima Tul. & C. Tul. 1865.
Anamorph	Cylindrocarpon willkommii (Lindau) Wollenw. 1928.
Homeopathy-	Nectrianinum.
Family	Nectriaceae.

KEYS

- Saprophytic-pathogenic fungus causing tree [beech] canker.
- Causes serious volume losses.
- Red and orange.
- Increases body temperature.
- Crisis terminating in polyuria and profound sleep.

FEATURES

- Pinhead-sized, red fruiting bodies resembling “coral spots” near canker margins or on dead areas of tree host.
- Bark within canker dies and appears dry and cracked.
- Small cankers are walled off by callus tissue, resulting in craterlike scars.
- Orange discoloration under the outer bark.
- Nectria canker is the most common canker disease of hardwood trees.
- It usually does not kill trees, but causes serious volume losses.
- Saprophytic, but may become pathogenic to trees weakened by mechanical injury, physiological stress, disease, insect infestation, or recent transplanting.
- Favours beech and red alder.
- Isolates of N. ditissima are being used as biological control agent [inoculation] for red alder [Alnus rubra].

• Canker fungi interact with host plants and the environment. These interactions keep a forest community adapted to environmental changes. The role that canker fungi play in such dynamics appears to be the removal of poorly adapted individuals, or at least to reduce their reproductive potential, hence to maintain the fitness of the tree population.

MATERIA MEDICA

« As an organism inducing canker in trees, Nectria evoked the interest of early researchers as a possible drug in the treatment of cancer in humans. Clarke writes:

> Nectrianinum is a clear liquid of a yellowish-brown hue which was prepared by Bra and Chausse *[Med. Rev. of Rev.,* April, 1900, quoted H. M., xxxv. 533] as follows: Cultures [of Nectria] of two months of age, on grape broth, are evaporated on a water bath until reduced to one-third of their original volume. They are filtered through paper and again through porcelain. The liquid is then taken to the autoclave at a temperature of 120° C. This assures that all spores are killed.
>
> Injected into healthy animals in 5 c.c. doses several times a week no result is observed.
>
> In cancerous men and animals, on the contrary, the injections cause a rise of temperature in from two to four hours of 1° to 3°. If the dose is increased the hyperthermia is accompanied by chills, sensation of cold, accelerated pulse, palpitation, headache, thirst. The crisis terminates after some hours in polyuria and profound sleep. In very advanced cancer reaction may not occur.
>
> In a summary of the results the observers say that Nectrianinum has caused: "Arrest or diminution of haemorrhages; suppression of fetid discharges; a tendency at times to epidermisation of the neoplasm with a corresponding well-defined arrest in its evolution." The patients were < when treatment was discontinued and > when it was resumed. A maximum of 4 c.c. per day was never exceeded.

Saprophytic-pathogeni fungus causing tree [beech] canker.
Causes serious volume losses.
Red and orange.
Increases body temperature.
Crisis terminating in polyuria and profound sleep.

Nectrianinum is listed in the repertory in the rubric "Cancerous affections, epithelioma." There is a certain similarity with the fungus, which attacks

and destroys the sapwood of the tree, causing the bark to die of desiccation. The ability to cause a rise in temperature and even fever is an interesting property of the drug, particularly since it occurred solely in cancerous men and animals.

This is in line with the long-held notion of the polarity between inflammation and cancer, confirmed by the spontaneous cures which have been observed in the course of acute febrile conditions such as erysipelas. Anthroposophic medicine perceives the weakening or suppression of febrile reactions as "a nidus for cancer to develop." Cancer treatment therefore aims to develop 'fever' in the sense of a rise in interest, excitement, commitment, activity, etc., as its psychological equivalents.

Foubister introduced the remedy *Carcinosinum* into homeopathic practice after his interest had been aroused "by a chance experience: that of having in the out-patient department simultaneously two children born of mothers who were, during the pregnancy, suffering from cancer of the breast." He observed that children with the "*Carcinosin* appearance" [blue sclerotics, a *cafi au la.it* complexion, and numerous moles] in many instances had "a strong family history of cancer," although in others there was "a strong family history of tuberculosis, of diabetes and pernicious anaemia."

And: "Gradually we gained the impression that in addition to the *'Carcinosin* appearancee' and a tendency to insomnia even in young children," [note that the crisis evoked by Nectrianinum terminates in profound sleep], "there was a tendency to have an inflammatory illness, usually a whooping cough or pneumonia, very early in life, and therefore almost severely. If, for the sake of argument, we accept McDonagh's concept that there are two basic diseases, inflammation and tumour formation, also the teaching of Rudolf Steiner, then it might not be too far fetched to regard this tendency to inflammation as a reaction against inherited tendencies. ...

We gained the impression that after administration of *Carcinosin,* there was considerable likelihood of an inflammatory reaction. In the children's ward Sister Sayer observed that children receiving *Carcinosin* often had *a rise of temperature* on the tenth day, and this has often been confirmed." [D.M. Foubister, *The Carcinosin Drug Picture;* Bombay, 1975]

III. ORDER LEOTIALES [HELOTIALES]

Contains 2,000 species in 400 genera in 13 families.

Ill A. FAMILY SCLEROTINIACEAE

Members of this family often form sclerotia, solid masses of fungal tissue, which, after overwintering in this guise, germinate in spring by using the stored energy to produce ascomata.

The spores are shot when the host is in flower, and gain entrance through the stigma.

In Botrytis the conidia are produced in bunches, in Monilia in chains.

BOTRYTIS CINEREA **Botr-c.**

Scientific name Botrytis cinerea Pers. 1801.
Synonyms Sclerotinia cinerea (Bonord.) J. Schrot. 1893.
Botrytis fuckeliana N.E Buchw. 1949.
Family Sclerotiniaceae.

KEYS

- Grey mould; saprophytic but may turn parasitic.
- Common contaminant of [over-mature] fruits [esp. strawberries] and vegetables.
- Invades plant tissues damaged by frost, punctures or fertilizer-burns.
- Causes abortion of flowers and reduces seed yields.
- Reacts strongly to slight changes in atmospheric humidity.
- Darkness or red light <; blue light >.
- Noble rot; special wines.
- Allergies [hay fever; asthma].
- Oxalic acid.

FEATURES

- Ubiquitous soil-borne mould with a wide host range, such as strawberries, tomatoes, grapes, kiwis, vegetables, but also conifer seedlings. One of the "most serious fungal market diseases of vegetables."
- Primarily found in humid, temperate and subtropical regions.
- Saprophytic but may turn parasitic.
- Does not easily establish infections on healthy tissue, but readily colonises damaged, senescing or dead plant tissues.
- Invades tissues damaged by frost, punctures or fertilizer-burns.
- Leads to abortion of flowers and reduced seed yields.
- Causes breakdown rot in over-mature fruits.
- Forms grey [L cinerea = ash-coloured] patches with a velvety, fluffy texture.
- Optimum temperature for mycelial growth and for germination of spores: 18-25° C.
- High humidity favours growth and spread.
- Hibernates by means of small, hard, black sclerotia or as dormant mycelium.

SPECIAL FEATURES

- Conidia turn away from unilateral light.
- Conidia formed sparsely in darkness or red light, but abundantly in blue light.
- Reacts strongly to slight changes in the humidity of the surrounding air by "throwing its ripe spores in every direction by twirling and twisting its sporangiophores."
- Volatile compounds may have considerable influence on decay producing microfungi. Ethyl acetate, a common fruity ester evolved by apples, exerts either a stimulatory or an inhibitory effect on the germination of B. cinerea. Volatile compounds from leaves of apple, Ruta, Eucalyptus and other aromatic plants increases its germination, whereas vapours from potato tubers and onions are inhibitory. [Wolf & Wolf]
- A single fruit infected by Botrytis can accelerate premature softening of the remaining fruit in a tray as a result of the ethylene produced during Botrytis fruit infection.
- Extracts of B. cinerea have been demonstrated to "digest tissues very rapidly when injected into them, but when placed at the surface of delicate rose petals, they cause no injury." [Wolf & Wolf]

NOBLE ROT

• The greatest amount of infection of mature or nearly mature grapes by this fungus occurs in regions where the relative humidity is high. It is seldom encountered in dry hot regions. Grapes infected by B. cinerea [“botrytized grapes”] become mouldy and shrivelled. At the right stage they are hand- picked and made into fine sweet table wines. Because of its flavourful impact the grey mould has become known among vintners as the *noble rot.*
The very best Sauternes are made this way, as are the Hungarian Tokay and the German ‘Trockenbeerenauslesen’ [literally: ‘dry berry selections’]. These unique and often expensive wines include Picolit, Gewiirztraminer, certain Rieslings, Vouvray, and Chateau d’Yquem. In California, botrytised wines are usually referred to as late harvest or select late harvest.

ALLERGY

• Botrytis cinerea is one of the most common *allergenic* moulds.
• It has a distinct odour like ammonia.
• In Sweden, in 1949, a panel of 1250 patients having allergy-related complaints was skin prick tested with B. cinerea and it induced a strong reaction in 50% of the mould-sensitized patients. Although not frequently identified in mould spore counts, Botrytis accounted for a frequency rate of positive tests only second to Cladosporium.

• Mould-allergic individuals are often sensitive to several mould species. Yet the aetiology may differ. More or less typical triggers for Botrytis-induced allergies such as hay fever, asthma and hypersensitivity pneumonitis include:
  • Vineyards/ wine cellars [‘winegrower’s lung’].
  • Botrytized wines.
  • Greenhouses or other indoor areas with high humidity and large numbers of plants.
  • Indoor plants.
  • Overripe fruits.
  • Strawberries. [It is interesting to note that oxalic acid is the product of the metabolism of many moulds - Penicillium, Aspergillus, Botrytis spp., among others - and that Oxalicum acidum is one of the few remedies having an aggravation from eating strawberries.]

Latin name Pseudallescheria boydii (Shear) McGinnis, A.A. Padhye & Ajello 1982.

Synonyms Monosporium apiospermum Sacc. 1911.
Acladium castellani Pinoy 1916.
Scedosporium apiospermum Sacc. ex Castellani & Chalmers 1919.
Allo[illegible]ia boydii Shear 1922.
Ind[illegible] americana Delamare & Gilgado 1929.
Sporotrichum beurmannii castellanii (Pinoy) Redaelli & Cif. 1942.
Acrenionium suis Bakai 1967.
Petriellidium boydii (Shear) Malloch 1970.
Raffaelea castellani (Pinoy) de Hoog 1974.
Scedosporium apiospermum Sacc. ex Castellani & Chalmers 1919.
Graphium eumorphum

Anamorphs PSEUDALLESCHERIA BOYDII

Aclad.

- Symptoms include those commonly observed in mould allergies: Sneezing.
Runny nose. Itching in nose.
Nasal congestion alternating with sudden unblocking of congestion.
Ringing [illegible]
Recurrent ear infections, fluid in middle ear [mostly in children].
Itchy, watery, swollen and red eyes.
Twitching of eyelids.
Blurred vision.
Eyes painful from glare.
Sinus headaches.
Dry tickling throat. Clearing throat
Recurrent bronchial affections.
Reduced lung capacity and difficulty breathing.
Chronic hacking cough.

IV. ORDER MICROASCALES

IVA. FAMILY MICROASCACEAE

KEYS

- Dark grey to dark brown mould.
- Polluted water, sewage, manure.
- Invasion through penetrating wounds.
- Near-drowning; aspiration of polluted water.
- Resembles aspergillosis.
- Rising occurrence in immunocompromised patients.

FEATURES

- Ubiquitous filamentous mould.
- Natural inhabitant of soil, sewage, contaminated water, and the manure of farm animals.
- Believed to be a major component of the thermal-enriched sloughs of the middle western part of the United States.
- Rapid growth at 25° C in colonies; optimal growth at 30-37° C.
- Texture of colonies woolly to cottony; surface colour initially white, later becoming dark grey or smoky brown.
- Differs from dimorphic fungi, eg Blastomyces and Sporothrix, by not converting to a yeast phase at 37° C.

PSEUDALLESCHIASIS

Known in French homeopathy as Acladium castellani this fungus has gone through several changes of name, demonstrating its particularly confusing taxonomy. The organism causes a condition termed *acladiosis,* which, according to Borland's Medical Dictionary, 1951, is "an ulcerative dermatomycosis occurring in Ceylon, the Malay States and Macedonia, and marked by the formation of roundish or oval ulcers with sharply defined edges and a granulating fundus." The specific name 'castellani' honours the Italian physician Aldo Castellani [1877-1971], who contributed hundreds of publications to medical mycology.

He was the first to recognize and describe Trichophyton rubrum *[see]* as well as some Candida species and worked from 1903 to 1915 as a bacteriologist for the Ceylon [Sri Lanka] government. Here he must have observed a mycetoma termed 'Madura foot' or 'maduramycosis', a condition that pretty much fits both the geographic distribution and the description given in Borland.

Mycetoma is a localised swollen lesion, usually on a foot or hand, less often on shoulders, buttocks, head, or any site which is subject to trauma. It involves skin, subcutaneous tissue, fascia and bone. The lesion contains granulomas and abscesses which suppurate and drain through sinus tracts. Despite the clinical similarities, the mycetomas are caused by at least 16 species of fungi, one of which is Acladium castellani, now known as Pseudallescheria boydii.

Mycetoma was first described from India by Van Dyke Carter in 1860. The old name ‘Madura foot’ and the orthographic derivative, ‘maduramycosis,’ in allusion to the high incidence of the disease in the province of Madura, India, reflect a geographic association which is significant only historically. Although most prevalent in the tropics, P. boydii is also the most common agent of eumycotic mycetoma in the USA and Europe.

Found worldwide the fungus is today an emerging opportunistic pathogen that can cause various infections in humans. The organism is often encountered as a contaminant of respiratory specimens from patients with chronic lung disease. It is also isolated frequently from open, dirty wounds. Exposure to contaminated water appears to be a leading cause. In terms of variety and severity, the spectrum of disease associated with P. boydii is similar to those caused by Aspergillus.

Dark grey to dark brown mould.
Polluted water, sewage manure.
Invasion through penetrating wounds.
Near-drowning; aspiration of polluted water.
Resembles aspergillosis
Rising occurrence in immunocompromised patients.

In addition to mycetoma, referred to as white grain mycetoma, P. boydii has been implicated in a wide range of infections in various organs and systems of the body, sometimes referred to as pseudallescheriasis.

In the older literature pseudallescheriasis has been called allescheriasis, petriellidiosis, and monosporiosis.

Infections usually develop after a traumatic injury by contaminated thorns, splinters from plants, fish scales, farm implements, etc. Most commonly affected are field workers, farmers, sugarcane workers, and fishermen. The initial lesions in immunocompetent patients are characterized by a feeling of discomfort and pain at the point of inoculation.

Within weeks, the subcutaneous tissue becomes indurated, abscesses develop, and sinuses may drain to surface. The subsequent phase of proliferation involves the invasion of muscles and intramuscular layers. Frequently secondary bacterial infections occur.

The hallmark of mycetoma is the presence of granules, which are macroscopic colonies of the fungus. The granules produced by P. boydii are white to yellowish and soft to firm, with a diameter between 0.2 and 2 mm.

Besides penetrating trauma, paranasal sinuses is the second portal of entry, followed by the lungs, via inhalation of airborne conidia. The usual presentation is fever followed by a dense area of pulmonary consolidation, local extension, and haematogenous dissemination.

Other infections include cutaneous infections, keratitis, lymphadenitis, endophthalmitis, meningoencephalitis, brain abscess, endocarditis, pneumonia,

lung abscess, pulmonary fungus ball, allergic bronchopulmonary fungal disease, bursitis, arthritis, osteomyelitis, urethritis, and disseminated infections. The affected host is commonly debilitated or immunocompromised due to various reasons, such as haematological malignancies, treatment with corticosteroids, or immunosuppressive therapy for organ transplantation, leukemia, lymphoma, systemic lupus erythematous, AIDS or Crohn's disease. During the last few decades, rhinopharyngeal and pulmonary colonization was reported in leukemic, cystic fibrosis, and otherwise impaired patients. Due to Pseudallescheria's neurotropism, with marked predilection for the cerebrospinal fluid, disseminated infections are often fatal. Cerebral infections are sometimes acquired after near-drowning events in polluted waters.

Invasive infections in normal patients are usually caused by traumatic implantation. Penetrating joint injuries, especially to the knee, may result in arthritis and osteomyelitis.

Non-invasive colonization of the external ear and pulmonary colonization in patients with poorly draining bronchi or paranasal sinuses and "fungus ball" formation in pre-formed cavities are similar to those seen in Aspergillus.

Infections are difficult to treat because of its resistance to common antifungal drugs such as amphotericin B. Orthodox treatment may require surgical intervention.

The diagnostic problems with this species are considerable. In tissue P boydii is indistinguishable from other filamentous fungi, and Cryptococcus antigen testing may lead to false-positive reactions.

Systemic infections may easily be misidentified as aspergillosis, leading to inappropriate therapy. This is one of the reasons that the mortality rate due to invasive pseudallescheriasis is high. However, the grey to dark brown colours of P. boydii are distinct from the dark blue-green to greyish turquoise colour of Aspergillus.

Pseudallescheria boydii has also been reported to cause keratitis, abdominal eumycotic mycetoma and disseminated infections in dogs, and keratitis and eumycotic mycetoma in horses.

V. ORDER SORDARIALES

Contains 600 species in 75 genera in 5 families of sap robes found on dung or decaying plant remains.

V A. FAMILY LASIOSPHAERIACEAE

Arthrinium arundinis

ARTHRINIUM ARUNDINIS **Arthr-ar.**

Scientific name Arthrinium arundinis (Corda) Dyko & Sutton 1979.
Synonyms Gymnosporium arundinis Corda 1838.
Coniosporium arundinis (Corda) Sacc. 1886.
Papularia sphaerosperma (Pers.) Hohn 1916.
Arthrinium phaeospermum (Corda) M.B. Ellis 1965.
Family Lasiosphaeriaceae.

FEATURES

- Fast-growing, white, woolly to cottony mould.
- Common saprophyte frequently found in soil and on decaying plants or grasses, particularly swamp grasses.
- Incriminated in reed dermatitis, in cane reed contact allergies in musicians [saxophone; clarinet], and in mouldy sugarcane poisoning occurring in China.

INTOXICATION

The French researcher M. Michel described in 1863 the “malfadie] des Cannes de Provence” [or ‘cane cutter’s disease’] among reed cutters exposed to mouldy reeds *[Arundo donax*\ which also became prevalent in the paper

mills of the Midi of France where *Arundo donax* was being used for its fibre. Ainsworth summarised the symptoms thus:

> "The disease presented as lassitude, stiffness, low fever, and slight scrotal swelling. Later a prurigenous erythema spread upwards from the inner surface of the thighs and becomes particualrly severe in the armpits. A cough develops. Work is no longer possible. The patient is obliged to rest. His condition at once improves and recovery is complete in ten to fifteen days. On reexposure to the reeds, symptoms recur."
>
> Miquel reported in 1845 the effects of a "dust-like fungus" developing on old stems of Arundo donax. "Peasants defend themselves against this dust [spores] by veiling their faces. If the fungus settles upon human beings, after twenty-four hours fever is set up, with gastric pains, weight and giddiness in the head, heat and burning in the face, upon which an exanthem appears in the form of vesicles and pustules.
>
> If the dust penetrates into the air-passages, violent coughing and dyspnoea ensue; if it enters the intestinal canal it produces colic, vomiting, and diarrhoea. The genitals also swell and become painful, so that satyriasis and symptoms *of* nymphomania may be developed. In general, the symptoms soon disappear, and, with peeling of the skin, recovery sets in." [cited in von Ziemssen, 1878]

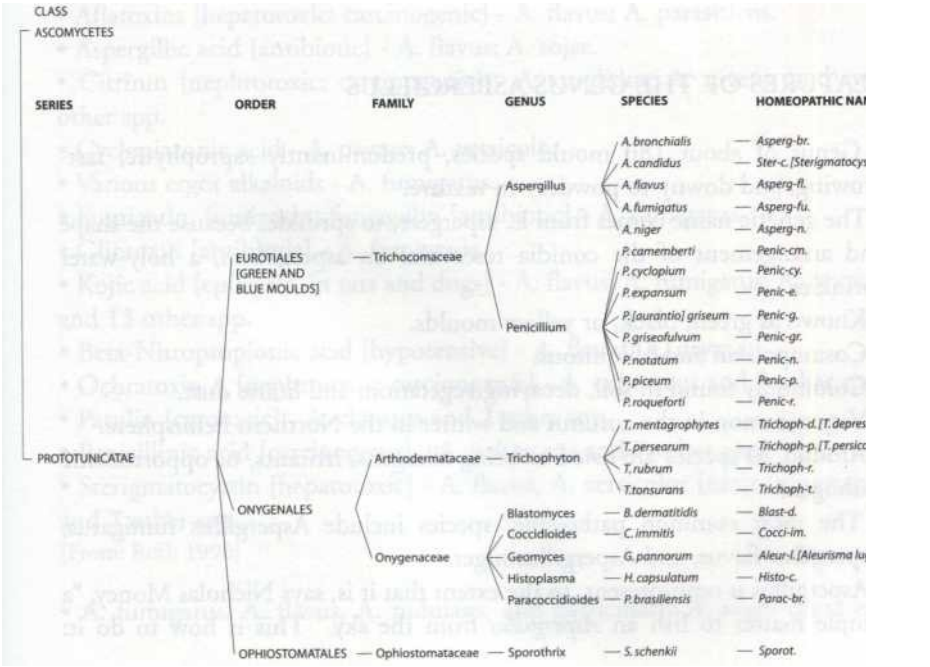
Series Prototunicatae

Prototunicate Asci have no active spore-shooting mechanism; the spores are released when the walls of the asci dissolve, decay or rupture.

ORDER EUROTIALES
ORDER ONYGENALES
ORDER OPHIOSTOMATALES

L ORDER EUROTIALES
(Blue and Green Moulds)

Contains 140 species in 50 genera, including some of the most successful of all conidial fungi [fungi producing spores exogenously from hyphal tips, not in sporangia] - the common green and blue moulds of the genera Penicillium and Aspergillus. These moulds produce antibiotics and mycotoxins and cause food spoilage.



I A. FAMILY TRICHOCOMACEAE [EUROTIACEAE]

Aspergillus bronchialis
Aspergillus candidus
Aspergillus flavus
Aspergillus fumigatus
Aspergillus niger
Penicillium camemberti
Penicillium chrysogenum
Penicillium cyclopium
Penicillium expansum
Penicillium griseum
Penicillium notatum
Penicillium piceum
Penicillium roqueforti

FEATURES OF THE GENUS ASPERGILLUS

- Genus of about 180 mould species, predominantly saprophytic, fastgrowing, and downy to powdery in texture.
- The generic name comes from L. aspergere, to sprinkle, because the shape and arrangement of the conidia resembles an aspergillum, a holy-water sprinkler.
- Known as green, black, or yellow moulds.
- Cosmopolitan and ubiquitous.
- Commonly found in soil, decaying vegetation, and house dust.
- Very common in the autumn and winter in the Northern hemisphere.
- Around 20 species are listed as being allergens, irritants, or opportunistic pathogens.
- The most common pathogenic species include Aspergillus fumigatus, Aspergillus flavus, and Aspergillus niger.
- Aspergillus is omnipresent, to the extent that it is, says Nicholas Money, “a simple matter to fish an *Aspergillus* from the sky.” This is how to do it:

"Open a Petri dish anywhere outside the sterile air of an operating room for a few seconds, close the lid, and leave it for a day or so, and the plate will likely sprout the conidium-producing stalks of an Aspergillus. If the experiment fails, the fungus is certain to appear on the second or third attempt."

- Aspergillus spp. cause considerable trouble by reducing the commercial value of and imparting a musty odour to shoes, leather, and clothing, a destructive process in which Penicillium spp., incidentally, are no less effective than the Aspergilli. "In humid tropical climates, where Aspergilli are especially troublesome, people have to keep their wardrobes as dry as possible to prevent shoes and clothing from being covered with a heavy growth of *Aspergillus.* It is common custom is such regions to have all wardrobes wired so that one or more electric light bulbs can be kept burning continually to keep the atmopshere dry." [Alexopoulos]

MYCOTOXINS

Compounds produced by Aspergillus spp. include:

- Aflatoxins [hepatotoxic; carcinogenic] - A. flavus; A. parasiticus.
- Aspergillic acid [antibiotic] - A. flavus; A. sojae.
- Citrinin [nephrotoxic; carcinogenic] - A. candidus; A. niveus; and two other spp.
- Cyclopiazonic acid - A. oryzae; A. versicolor.
- Various ergot alkaloids - A. fumigatus.
- Fumigatin, fumigacin, fumagillin [antibiotic] - A. fumigatus.
- Gliotoxin [antibiotic] - A. fumigatus.
- Kojic acid [epileptic, in rats and dogs] - A. flavus; A. fumigatus; A. oryzae; and 13 other spp.
- Beta-Nitropropionic acid [hypotensive] - A. flavus; A. oryzae.
- Ochratoxin A [nephrotoxic; carcinogenic] - A. ochraceus and 7 other spp.
- Patulin [cytotoxic] - A. clavatus and 2 other spp.
- Penicillinic acid [carcinogenic] - A. ochraceus and 7 other spp.
- Sterigmatocystin [hepatotoxic] - A. flavus, A. versicolor [most important] and 7 other spp.

[From: Roth 1990]

- A. fumigatus, A. flavus, A. nidulans, and particularly A. niger cause ear

infections in man, plugging the canal with mycelium which leads to impaired hearing. Mostly the outer ear is affected, but in some cases the eardrum is penetrated and the middle ear invaded.

ASPERGILLUS BRONCHIALIS **Asperg-br.**

• The identity of this species is dubious. It was isolated from lung tissue of a diabetic patient and classified as A. bronchialis by Blumentritt. Most probably it concerns a strain of *Aspergillus fumigatus.*

ASPERGILLUS CANDIDUS **Asperg-c.** **[Ster-c.]**

Scientific name Aspergillus candidus Link 1809.
Synonym Aspergillus okazaki i Saito.
Family Trichocomaceae.

NOTE: The repertory uses the name Sterigmatocystis candidum and the abbreviation Ster-c. for this species. The genus Aspergillus was once known as Sterigmatocystis due to the characteristic flask-shaped structures called *sterigma* placed on a bladder-like [cystis] support. The name is no longer used.
Aspergillus candidus and A. albus are considered different species in mycology, but are both given by the French homeopathic physician Robert Seror as synonyms of Sterigmatocystis candidum.

KEYS

• Saprophytic fungus preferring warm soils and stored grain.
• Used in the production of miso, soy sauce and sake.
• Inhibits the production of the pigment melanin. Used in skin lightening cosmetics.
• Copper.

FEATURES

• Common soil organism; found in warm soils, grain, and secondary decay of vegetation.
• Colonies white to yellowish white.
• May form small purple sclerotia.
• Abundant in grain dust; occupational hazard for grain elevator operators

["elevator operator's lung"].
- Used in the production of miso, soy sauce and sake.
- Produces citrinin *[see* Penicillium chrysogenum] and kojic acid.

KOJIC ACID

• The secondary fungal metabolite kojic acid is produced by many species of Aspergillus and Penicillium. Its name is derived from its discovery in an Aspergillus species grown on steamed rice, which is called *koji* in Japanese. The compound has weak bacteriostatic activity and inhibits the enzyme tyrosinase to produce the pigment melanin. Tyrosinase is important for pigmentation of the skin under ultraviolet light. Kojic acid and its derivatives are widely used in skin lightening [depigmentation] cosmetics and in mouth or teeth care products. The substance successfully reduces age spots, freckles, acne spots, and pigmentation on the body, as typically caused by sun damage. Tyrosinase is very abundant in melanoma, skin cancer, cells. It has copper as its cofactor. Kojic acid inactivates the enzyme by reacting with the copper. Aspergillus spp. appear to have a predilection for copper. *[See* Aspergillus niger].

Saprophytic fungus preferring warm soils and stored grain. Used in the production of miso, soy sauce and sake. Inhibits the production of the pigment melanin. Used in skin lightening cosmetics. Copper.

As a preservative and colour stabilizer kojic acid is used in the processing of meat, fruit and vegetables, and to keep cut-flowers fresh. [By inhibiting tyrosinase, which causes the browning of the cut surfaces of fruits and vegetables.] Medically it has slight antiinflammatory and analgesic effects.

Copper plays a role in the functioning of the thyroid by producing the hormone thyroxine, along with iodine. Kojic acid inhibits iodine uptake by the thyroid at high doses in experimental animals. No data are available on the related effects of kojic acid in humans. It is a potent goitrogen in rodents, in which treatment results in decreased serum thyroid hormone concentrations, increased thyroid-stimulating hormone secretion, enlargement of thyroid gland and diffuse follicular-cell hypertrophy and/or hyperplasia. It is not known whether kojic acid exerts any influence on tyrosinase as a catalyst in the production of the neurotransmitters dopamine and norepinephrine [adrenalin]. Dopamine controls motivation, movement and emotions.

Scientific name Aspergillus flavus Link 1809.
Family Trichocomaceae.

KEYS

- Yellow to olive green saprophytic mould.
- Lipophilic; associated with fats and oils [nuts, peanuts and tree seeds].
- Warm, humid climates. High relative humidity.
- Soy sauce.
- Aflatoxins.

FEATURES

- Ubiquitous saprophyte in soil, but concentrated in warm, humid climates.
- Conidia yellow when young, later olive green, and brownish green with age.
- Forms reddish brown sclerotia.
- Predominantly associated with *oils* and *fats.*
- Causes spoilage of walnuts, pecans, Brazil nuts, chestnuts, pistachio nuts, cotton seed oil, and peanuts.
- Consumes olive oil, cocoa butter, beeswax, tripalmitin, and higher paraffins.
- Growth is most prolific on plants that have been damaged by insect activity or other types of environmental stress.
- Very closely related to A. parasiticus as well as to A. oryzae and A. sojae.
- Diastase from A. flavus or A. oryzae, an enzyme that converts starch into sugar, is used in the preparation of soy sauce and in the fermentation of rice to make sake.
- Has the ability to produce alcohol.
- Produces flavacidin [flavicin], source of the antibiotic Amylpenicillin Sodium. Flavacidin is also produced by Penicillium chrysogenum and P. notatum.

GROWING CONDITIONS

• Growing in decaying vegetation, in hay and grains undergoing microbiological deterioration, A. flavus can heat these substrates up to 45°-50° C and hold the temperature there until the substrate is just about totally consumed.

• A. flavus needs a minimum moisture content of 85% relative humidity in its substrate. Unlike some other fungi, A. flavus does not have a maximum moisture content for growth - the higher the moisture content above the lower limit, the faster the fungus grows.

AFLATOXINS

• It began in 1960 in England with the outbreak of Turkey X-disease killing 100,000 turkeys. Loss of appetite and lethargy preceded their death from liver failure. The discovery that they had been fed aflatoxin-contaminated peanut meal touched off a flurry of research. It has now become the most studied mycotoxin.

• Aflatoxins [named from *A. flavus toxins]* are synthesized in nature only by two species: A. flavus and A. parasiticus.

• The minimum temperature for the production of aflatoxin by *Aspergillus flavus* is 12° C, the optimum is 27° C, and the maximum is 42° C.

• A. flavus isolates usually make only B aflatoxins, and less than 50% of isolates are toxigenic, while A. parasiticus isolates make G as well as B aflatoxins, and are invariably toxigenic.

Yellow to olive green saprophytic mould. Lipophilic; associated with fats and oils [nuts, peanuts and tree seeds]. Warm, humid climates. High relative humidity. Soy sauce. Aflatoxins.

• "The four major naturally produced aflatoxins are known as aflatoxins Bl, B2, G1 and G2. 'B' and 'G' refer to the blue and green fluorescent colours produced by these compounds under ultraviolet light illumination on thin layer chromatography plates, while the subscript numbers 1 and 2 indicate major and minor compounds, respectively.

When aflatoxin B1 and B2 are ingested by lactating cows, a proportion [ca 1.5%] is hydroxylated and excreted in the milk as aflatoxins Ml and M2, compounds of lower toxicity than the parent molecules, but significant because of the widespread consumption of cows' milk by infants. Aflatoxins are both acutely and chronically toxic to animals, including man. They produce four distinct effects: acute liver damage; liver cirrhosis; induction of tumours; and teratogenic effects." [J.I. Pitt, Toxigenic

Aspergillus and Penicillium species]

• The chances of human exposure to acute levels of aflatoxin is remote in well-developed countries. The incidence of primary hepatocarcinomas is more than 100 times as high in some countries of Africa and Southeast Asia as in some of the northern European countries.

"In some portions of India and Southeast Asia primary hepatocarcinomas occur even in nursing children," states Christensen, "and the evidence is that this probably is due to aflatoxin posioning. The mother consumes maize, rice, peanuts, millet, or some other product that contains aflatoxin. Enough of this aflatoxin will be excreted in the mother's milk to engender cancer in the infant. ... The same situation must prevail in many areas of the warm and humid tropics around the world."

One of the most important accounts of aflatoxicosis in humans occurred in more than 150 villages in adjacent districts of two neighboring states in northwest India in the fall of 1974. According to one report of this outbreak, 397 persons were affected and 108 persons died. In this outbreak, contaminated corn was the major dietary constituent, and aflatoxin levels of 0.25 to 15 mg/kg were found.

The daily aflatoxin Bl intake was estimated to have been at least 55 ug/kg body weight for an undetermined number of days. The patients experienced high fever, rapid progressive jaundice, oedema of the limbs, pain, vomiting, and swollen livers. One investigator reported a peculiar and very notable feature of the outbreak: the appearance of signs of disease in one village population was preceded by a similar disease in domestic dogs, which was usually fatal.

Histopathological examination of humans showed extensive bile duct proliferation and periportal fibrosis of the liver together with gastrointestinal haemorrhages. A 10-year follow-up of the Indian outbreak found the survivors fully recovered with no ill effects from the experience.

A second outbreak of aflatoxicosis was reported from Kenya in 1982. There were 20 hospital admissions with a 60% mortality; daily aflatoxin intake was estimated to be at least 38 ug/kg body weight for an undetermined number of days.

In a deliberate suicide attempt, a laboratory worker ingested 12 ug/kg body weight of aflatoxin B1 per day over a 2-day period and 6 months later, 11 ug/kg body weight per day over a 14-day period. Except for transient rash, nausea and headache, there were no ill effects; hence,

these levels may serve as possible no-effect levels for aflatoxin Bl in humans. In a 14-year follow-up, a physical examination and blood chemistry, including tests for liver function, were normal.

> [U.S. Food & Drug Administration Center for Food Safety & Applied Nutrition - Foodborne Pathogenic Microorganisms and Natural Toxins Handbook]

• Peanuts probably head the list of high-aflatoxin-risk foods because peanuts are consumed in quantity by a large proportion of the population in many countries, and because the conditions under which peanuts are grown and stored are optimum for A. flavus to produce aflatoxins. Christensen recommends that "anyone who travels or sojourns in tropical countries *anywhere* in the world would do well not to eat peanuts or peanut products in any form, *ever."*
Opinions on the danger of peanuts can be pretty harsh:

> Then the professor strode to the front of the room. Unceremoniously he dropped his notebook on the lectern and proceeded to issue a stern warning to those of us who persisted to squander our meagre funds at the local tavern: we were all doomed to short, excruciatingly painful lives. "It's not the beer that will get you," he said. "It's those free peanuts. They are loaded with a mould that makes one of the most potent carcinogens known to man. Your liver just can't take such abuse forever!" I felt relieved that I had had popcorn the night before.
> [Hudler 1998]

• Aflatoxin B1 has indeed been demonstrated to be the most potent liver carcinogen known, in laboratory animals. However, rodents and humans may react in different ways to the same toxins, for the incidence of liver cancer in the United States is much lower than that forecast by the diseased rodents. Recent information suggests that prior or simultaneous exposure to hepatitis B predisposes for aflatoxin-induced liver cancer in humans.

• The 1979 FAO report entitled *Perspective on Mycotoxins* suggests an association of aflatoxin ingestion with "an acute disease involving encephalopathy and fatty degeneration of viscera [EFDV] that caused the death of several hundred children in Thailand per year. Analyses of foods from local markets showed that aflatoxin contamination paralleled incidence of the disease on both a geographic and a seasonal basis. ...

Deaths of children with the EFDV syndrome also have been reported in Czechoslovakia. Over a period of 5 years, deaths of 27 children occurred at ages 3 days to 8 years. Twenty children died within 2-7 days after the first symptoms of the disease, three within 1-2 months after acute onset, and four children 2-4 months after the first symptoms. Aflatoxin was demonstrated in liver specimens of all groups. The source of aflatoxin in three cases was aflatoxin-contaminated milk food."

Aside from aflatoxins, several other causes of EFDV, clinically known as *Reye's syndrome,* have been described: viruses such as influenza A or B, and varicella; salicylates [aspirin]; and intrinsic metabolic defects.

> Severity of the diseases varies gready, but the syndrome is characterized by a biphasic illness: Initially a viral infection, usually an upper respiratory infection [occasionally exanthematous], is followed on about day 6 by the onset of *pernicious* nausea and vomiting and by a sudden change in mental status. When associated with varicella, the encephalopathy usually develops on the 4th to 5th day of the rash.
>
> The changes in mental status may vary from a mild amnesia and noticeable lethargy to intermittent episodes of disorientation and agitation that often progress rapidly to deepening stages of coma manifested by progressive unresponsiveness, decorticate and decerebrate posturing, seizures, flaccidity, fixed dilated pupils, and respiratory arrest. Hepatomegaly occurs in about 40% of cases, but jaundice is rare. ... Reyes syndrome should be suspected in any child exhibiting the acute onset of an encephalopathy [without known heavy metal or toxin exposure] and pernicious vomiting associated with hepatic dysfunction.
>
> [Merck Manual]

Aspergillus flavus
[40 μτη]

ASPERGILLUS FUMIGATUS **Asperg-fii.**

Scientific name Aspergillus fumigatus Fresenius 1863.
Family Trichocomaceae.

KEYS

- Bluish-green to grey saprophytic mould.
- Thrives in humid conditions.
- Tolerates very high temperatures.
- CNS disease related to hot weather.
- Birds.
- Allergies; predilection for the nose and sinuses.
- Aspergillosis.

FEATURES

- Ubiquitous saprophyte in soil.
- Common in silage, stored cereals, compost piles, garbage dumps, bird's nests.
- Colonies bluish-green to grey.
- Thrives in wet conditions, like all moulds, but the optimum temperature for its growth is 37° C.
- Particular to this species [and A. flavus] is its thermotolerance. It grows at temperatures up to 55° C.
- Contains several ergot alkaloids. "This mould, rather than ergot, may have been the causal agent in epidemics of central nervous system disease in hot weather." [Matossian]
- Associated with *birds,* causing pneumonic symptoms in canaries, grouse, quail, poultry, birds of prey, owls, pigeons, penguins, water fowl, and other birds, at times in epidemic proportions.

INFECTION

- Inhalation of spores of Aspergillus fumigatus may be followed promptly by asthmatic symptoms, fever, malaise and prostration, with recovery within 12 to 36 hours]. [Emmons]

• Causes involvement of the lungs of workers who polish metals [use of abrasives] or of persons occupied as hair combers or feather dressers or employed in force-feeding fowls or preparing furs for clothing. [Wolf & Wolf]
• Regularly pathogenic, attacking man, particularly in humid regions, most commonly producing symptoms that clinically resemble those of pulmonary tuberculosis.
• Can cause allergic bronchopulmonary disease and allergic sinusitis; often found as a cause of infection of the turbinate and ethmoid regions of the nose.
• Secretes biologically active substances that slow down the expectoration of mucus formed in the air passages [where the fungus resides]. It thereby prolongs its stay, which for the host increases the risk of sensitization.
• Aspergillosis is a localized or systemic fungal invasion caused by the growth of the fungus itself. Bronchopulmonary aspergillosis arises when mucus within the bronchi is colonized, whilst the fungus in invasive aspergillosis grows outward from the lung, invading blood vessels and spreading through the bloodstream to other organs, including brain, eye, heart, kidney, skin, and bone.

Bluish-green to grey saprophytic mould.
Thrives in humid conditions.
Tolerates very high temperatures.
CNS disease related to hot weather.
Birds.
Allergies; predilection for the nose and sinuses.
Aspergillosis.

ASPERGILLOSIS

• Human pulmonary aspergillosis was first reported in 1847 and accurately described by Virchow in 1856. For the next eighty years or so it was believed that such infections in man were so rare that they were of little practical importance, although Schneider, in 1930, suggested that some cases of aspergillosis remained undetected since clinical symptoms and X-ray findings were held for those of pulmonary tuberculosis. He further stated that tuberculin tests are of no diagnostic value, since aspergillosis gives the same local reaction as tuberculosis.
The increasing incidence of aspergillosis, and other systemic mycoses, appears to be closely connected with the increasing number of patients with major risk factors. In the case of aspergillosis these include, according to the Merck Manual: “neutropenia, long-term high-dose corticosteroids therapy, organ transplantation [especially bone marrow transplantation], hereditary disorders of neutrophil function, such as chronic granulomatous disease, or,

occasionally, AIDS." Invasive aspergillosis has a high rate of mortality. So-called 'opportunistic' pathogenic fungi know how to take advantage of an opportunity when the body's natural resistance is lowered.

> Although much has been written and repeated about occupational exposure to conidia of Aspergillus, exposure is probably much less important than abnormal susceptibility. In Renon's classic 1897 monograph, 5 of the 6 patients reported were either pigeon feeders or wig cleaners and were assumed to have an unusually heavy exposure to *A. fumigatus.* Renon recognized tuberculosis in other patients with aspergillosis, and some of his contemporaries thought that he had not excluded the diagnosis of tuberculosis from the 6 cases that he accepted as primary.
>
> Although the alleged importance of these occupational exposures has been emphasized ever since Renon's report, their significance is not important today. A more probable occupational exposure can be postulated for farmers and gardeners, and may well be due in many cases to inhalation of conidia of *A. fumigatus* as well as the spores of other fungi. While bronchiectasis or other bronchial disease may follow repeated heavy exposure to inhaled spores, invasive parenchymal disease rarely ensues.
>
> Remarkable sources of this thermophilic fungus may be found in certain types of vegetable compost during early stages of decomposition. When green leaves and branches trimmed from the trees of city streets are passed through a "chipper," the resulting coarse wood chips and green vegetation provide an excellent medium for *A. fumigatus.* If a pile of this material is exposed to rain, microbial fermentation produces within a few days a high temperature which supports luxuriant growth of this fungus. Indeed, the chips may appear to be supporting a nearly pure culture.
>
> The gardener who uses this material for mulch is exposed to millions of spores. If he is hypersensitive, he may react with a severe allergic response. If he is debilitated, has another pulmonary disease, or has increased susceptibility due to medication with corticosteroids, *e.g,* the inhaled spores may germinate and the fungus may invade lung parenchyma to produce typical aspergillosis.
>
> [Emmons 1977]

• Patients with asthma and cystic fibrosis can frequently develop allergic bronchopulmonary aspergillosis [ABPA], a hypersensitivity reaction to the fungus Aspergillus fumigatus, which frequently leads to a progressive loss in lung function.

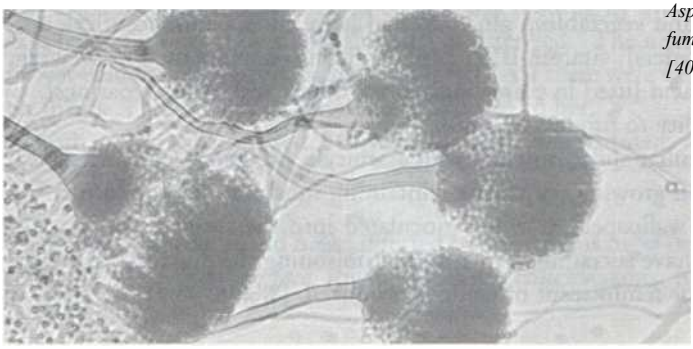
The symptoms of ABPA are similar to those of asthma: intermittent episodes of feeling unwell, coughing, wheezing, and, in some patients, expectoration of brown-coloured plugs of mucus.

• Aspergilloma, or fungus ball, is a characteristic saprophytic, noninvasive growth of tangled masses of hyphae, with fibrin exudate and few inflammatory cells, typically encapsulated by fibrous tissue. Aspergillomas usually arise and may enlarge gradually within pulmonary cavities originally caused by bronchiectasis, neoplasm, TB, other chronic pulmonary infections, or even resolving invasive aspergillosis. Rarely, chronic necrotizing invasive pulmonary lesions occur, usually in association with corticosteroid therapy. [Merck Manual] Initially asymptomatic, later weight loss, chronic cough, malaise, and haemoptysis. The haemoptysis is typically resistant to [allopathic] therapy.

• The symptoms of Aspergillus sinusitis resemble those of common sinusitis: obstruction of the nose, headache, fever, and facial pain or discomfort.

FUMAGILLIN

• Fumagillin is used in the treatment of amoebic dysentery. In exceptional cases after medication for fourteen days with doses totaling 560 mg., leukopenia has been observed, associated with sore throat, itching and desquamation of the palmar and plantar surfaces, and maculopapular eruptions. One patient developed in addition thrombocytopenia and some evidence of parenchymal liver injury." [von Oettingen]



Aspergillus fumigatus [40 pm]

ASPERGILLUS NIGER **Asperg-n.**

Scientific name	Aspergillus niger var. niger Tieghem	1867.
Synonym	Aspergillus niger Tieghem 1867.	
Family	Trichocomaceae.	

KEYS

- Jet black saprophytic mould.
- Musty odour.
- Citric acid; soft drinks.
- Reacts with arsenicals.
- Copper; detects copper.
- Ear infections and nasal sinus infections.
- Skin reactions; swelling of the face.

FEATURES

- Ubiquitous saprophyte in soil.
- Can basically be found everywhere: on foodstuff, paints, leather, plastics, optical glass, paper, textiles, soils, etc.
- Mycelial mat white to yellow, later bearing jet black conidia.
- Musty [mouldy] odour.
- Requires calcium for growth.
- Associated with rot of pomegranates, figs and dates; also causes decay of stored tobaccos and cigars.
- Used in the commercial production of citric acid [crucial for the soft drink industry, for emulsifying processed cheese, and to prevent vitamine C loss in canned fruit and vegetables]; gluconic acid [applied in pharmaceuticals and in baking powders]; vitamin Bl2; starch-splitting enzymes used in brewing; and itaconic acid [used in paints, adhesives, fibres, and surface coatings],
- Has the ability to produce alcohol.
- Has the peculiar ability to react with arsenicals. Liberates volatile arsenical products when growing on arsenic-containing substrates [eg the former use of arsenic in wallpaper] or when inoculated into the stomach contents of persons who have succumbed to arsenical poisoning. In this reaction a very pungent odour reminiscent of garlic is produced. [Wolf & Wolf]

• Of 76 chemical elements tested, iron, zinc, copper, manganese, gallium, and molybdenum were found to comprise all that may be regarded as essential for this species. [Wolf & Wolf]

COPPER

• The colour of Aspergillus colonies is one of the criteria for identification. Pigment production in Aspergillus is profoundly influenced by the presence or absence of minute quantities of trace elements. "So sensitive are these fungi that *Aspergillus niger* is used to detect *copper,* in soils and other substances, in amounts that are too small to be determined by chemical methods. Mulder [1938] determined that 2.5 millionths of a gram of copper is sufficient to induce maximum depth of colour in this organism. When the copper content falls below this amount, the colour of the conidia is proportionately lighter, and in the almost complete absence of copper the normally dark brown to black conidia appear yellow." [Alexopoulos]

Jet black saprophytic mould.
Musty odour.
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Reacts with arsenicals.
Copper; detects copper.
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Skin reactions; swelling of the face.

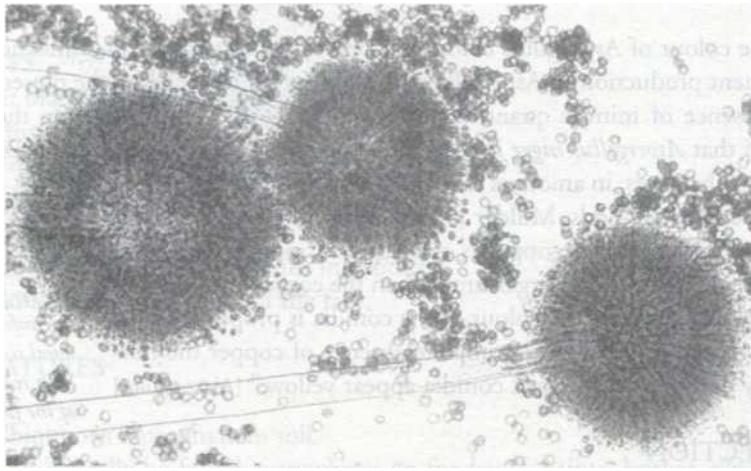
INFECTION

• Aspergillus niger reportedly causes skin and pulmonary infections. It is a common cause of fungal related ear infections and nasal sinus infections.
• Less common cause of aspergillosis.

• A fragmentary proving by Karl-Josef Muller on a female prover with 30c and 200c resulted in "swelling of the face, as if stung by a bee." The facial skin felt "as if burnt", was sensitive and "lobster-red." The next morning the prover couldn't open her eyes; the eyelids felt "as if there were weights hanging on them." These symptoms were not unknown to her.
In both armpits a "really red, inflamed circular patch" formed, which she had never had before.

• The consumption of old bread infected by Aspergillus niger or A. fumigatus results in *swelling of the face,* thirst, vomiting, colicky pains,

• According to Gray, Aspergillus spp. produce skin reactions in one-third of fungus-sensitive individuals [on a total number of 261 patients tested].



Aspergillus niger
[40pm]

PENICILLIUM

FEATURES OF THE GENUS PENICILLIUM

- Genus with 150 recognized species of usually fast-growing *moulds,* in shades of green; filamentous; velvety, woolly, or cottony in texture.
- Colonies commonly produce a strong musty odour.
- Conidia [asexual fungal spores produced from a hyphal tip] are borne in brush-shaped chains at the end of branched conidiophores.
- Generic name derived from L *penicillus,* paintbrush, diminutive of *penis,* tail.
- Active decomposers of cellulose and lignin, together with species of Aspergillus.
- Very common in temperate climates in soil, largely confined to the top six inches, along with species of Aspergillus, Mucor, Fusarium and Cladosporium.
- Ubiquitous spoilage fungi; very frequently found as a coating on a great variety of organic substances [containing ample supplies of carbohydrate], including bread, cheese, rotting fruits, jams, and preserves.
- Some species are found in house dust.
- Grows in water-damaged buildings on wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint.
- The optimum temperature for Penicillium spp. is usually 25-30° C, although some species survive temperatures as low as 4° C.
- When the available carbohydrates are insufficient, Penicillium spp. obtain both energy and nitrogen compounds in the soil, setting free surplus ammonia in the process.
- Common cause of hay fever, asthma, and hypersensitivity pneumonitis [cheese washer s lung; mouldy wall hypersensitivity].
- Major competitors/ antagonists of [soil] bacteria, and vice versa. Fungal strategies for survival include the production of such complex organic compounds as penicillin derivatives, which inhibit bacterial growth by blocking the formation of bacterial cell walls. Bacteria, in turn, produce certain enzymes, e.g. penicillinases, that inactivate Penicillium spp. That the presence of competitive organisms may play a role in the production of mycotoxins is corroborated by the observation that some moulds grown in monoculture in the laboratory lose their toxic potency.

Mankind's awareness of the curative powers of moulds is hardly new. Since the time, three thousand and more years ago, when the Chinese put mouldy soybean curd on boils and other skin infections, fungi have had a place in the pharmacopoeia of one nation after the other. Primitive peoples all over the world have used warm earth, which contains moulds and other fungi, as first aid for injuries.

Generations came and went, and the belief persisted. In 1640 John Parkington, Apothecary of London and the King's Herbarian, advised that moulds be applied to wounds. And in this very century, a traveller to the remote mountainous region of Yugoslavia witnessed an amazing scene. A peasant, gored by a bull, shouted to his wife for aid. The woman rushed out, saw what had happened and dashed back into their cottage, only to reappear seconds later clutching a mouldy chunk of bread. This was immediately clapped onto the gaping wound.

Such behaviour could be dismissed as typical of uneducated, backward people, but doctors, too, in pre-penicillin days, sometimes turned to the moulds for help in treating difficult cases. In 1900 a doctor in Iowa fed mouldy bread to a boy who was desperately ill with a strep throat and tonsillitis. The youngster's temperature went down and he began to improve, leading the physician to comment privately: "If I should tell other doctors, they would think me crazy." [Kavaler 1965]

ALLERGIES

• In the mid- 19th century the English physician Charles Blackley produced experimental evidence demonstrating allergy induced by fungus spores. A sufferer from hay fever himself, Blackley made a prolonged study of his own condition by testing the effects of inhaling pollen and a range of other agents, including fungi.

The inhalation of the odour of one of the microscopic fungi *[Chaetomium]* produced rather unpleasant symptoms with me, but these were not at all like the symptoms of hay-fever. The spores of another of the microscopic fungi *[Penicillium glaucum]* I have reason to believe will, when brought into contact with the respiratory mucous membrane, generate symptoms not unlike those of hay-fever in some respects, but differing materially in others - being much more like those of ordinary influenza.

I had noticed many years ago that dust from straw sometimes brought on attacks of sneezing with me, and that this seemed to occur more frequently when we had had a long spell of wet weather. I determined to try what fungi could be generated on damp straw. For this purpose wheat straw, slighdy moistened, was placed in a closed vessel, and kept at a temperature of 100° Fahrenheit. In about 24 hours a small quantity of white mycelium was seen ... This, I found on examination, was the *Penicillium glaucum* [P. expansum]. After a few days another crop of dark-coloured spots were seen ... These I found to be the *bristle mould [Chaetomium elatum].*

The spores of these two fungi were sown again separately on straw that had been placed in separate vessels having been subjected to the action of boiling water for a short time. A separate crop of each fungus was thus obtained.

The *odour* of the *Penicillium* produced no perceptible effect upon me, but the odour of the *Chaetomium* brought on nausea, faintness, and giddiness on two separate occasions. By inhaling the spores of the Penicillium ... a severe attack of hoarseness, going on to complete aphonia, was brought on. This lasted for a couple of days, and ended in a sharpish attack of bronchial catarrh, which almost unfitted me for duty for a day or two ... The sensations caused by these two agents were so unpleasant that I have never cared to reproduce them.

[Blackley 1873]

• Penicillium spp. are a common cause of extrinsic asthma [immediate-type hypersensitivity: type I]. Acute symptoms include oedema and bronchiospasms. It may also cause headaches, vomiting, and diarrhoea.

• The importance of mould allergy has been generally recognized during the last fifty years. Repeated exposure to high concentrations of the spores from allergenic fungi, often species of *Penicillium* and *Aspergillus,* can lead to sensitization, and produce acute or chronic symptoms. Similar complaints have been seen in office workers when hidden air-conditioning systems have supported massive growth of similar moulds. Bronchial asthma is also frequendy provoked by airborne fungal spores, usually belonging to the mould genera *Al temaria, Aspergillus, Drechslera [' Helminthosporium]* and *Penicillium.* These spores reach their highest numbers in fall, with another lower peak in spring.

Indoor air in the dwellings. Germs of *Penicillium* spp. were isolated in homes in the USA [in 26-51% of examined places], in South California [in 91% of 68 examined dwellings, at the maximum concentration in the

air 4737 spores/m^3, on an average 168 spores/m^3], in Canada [the concentration in indoor air was on an average 108 cfu/m^3, in dust 8.1 x 10^4 cfu/g], in homes in central Scotland [in 95% of all examined homes, 34% of all isolates], in dust from dwellings in Saudi Arabia [17% of all isolates, at a concentration of 23,500 cfu/g, and in homes in the Netherlands [in 11% of all examined homes].

In indoor work environment at maize storage, 11% of viable *Penicillium* spp. spores were of such a size that they were able to form a deposit only in the upper part of the respiratory tract, 13.2% in the pharynx, 18.9% in trachea and primary bronchi, 33.5% in secondary bronchi, 17% in terminal bronchi and 3.6% in alveoli.

... Vital and devitalized spores of fungi in the indoor air of houses are important aeroallergens in genetically determined humans.

In dwellings occupied by children suffering from asthma significantly greater spore counts of *Cladosporium* species and *Penicillium* species were found. In some case studies an evident relationship between the presence of the fungus in dwellings and allergic reactions of their occupants was found. After cleaning the contaminated sites, or when the occupants moved into a new home, the symptoms disappeared.

... An occupant of a "mouldy" dwelling is exposed in that environment not only to microscopic fungi but also to a number of various volatile compounds released from furniture, carpets, various paints and other materials. ... Some authors revealed that in occupants of "mouldy" dwellings there is a higher incidence of bronchitis, sore throat, concentration difficulties, backaches, irritation *of eyes* and oral cavity, feeling of weakness, etc.

[E. Pieckovi & Z. Jesenska, Microscopic Fungi in dwellings and their health implications in humans; Ann. Agric. Environ. Med. 1999, 6, 1-11]

• The main side *effects of penicillins* [antibiotics] are *allergic, hypersensitivity reactions,* caused by the degradation products of penicillin that combine with host protein and become allergenic. The widespread use of penicillins has resulted in an increasing number of allergic reactions, although the direct toxicity of penicillin is very low. Patients suffering from asthma, hay fever and allergies are definitely more susceptible than others. Patients suffering from eczematous conditions are also believed to be more prone to allergic reactions from penicillin. *Skin rashes* and fever are common, whilst other allergic reactions as vasculitis,

interstitial nephritis and various blood disturbances are observed occasionally. “Probably the most common reaction is urticaria, which often starts at the palms and soles and then becomes generalized. It may pass into angioneurotic oedema and be associated with low-grade fever, pain and/or swelling of the joints lasting one week and occasionally longer. Other patients develop skin eruptions characterized by redness with intense itching, papular, vesicular, or bullous eruptions, which may be followed by exfoliative dermatitis.” [von Oettingen]

• As allergenic agents Penicillium spp. prototypically express the elements of *invasion* and *intrusion.*

> As all species of *Penicillium* produce enormous numbers of spores that are blown about in the air, they are a constant nuisance in culture work; they are veritable laboratory weeds. Everyone who has been subjected to the *Lebensraum penetrations* of these moulds, has either scrapped the infected culture, or, if expedient, has cut out and removed the unwanted intruder. Fleming, about to discard the culture plate, noticed that there was a zone of dead Staphylococci around the circumference of the colony of *Penicillium. ...* Instead of disposing of the culture, he decided to try to find out whether it really was the mould that was killing the *Staphylococcus. ...*
> [Ramsbottom 1953]

• The discovery of the antibiotic properties of Penicillium spp. seems to have resulted from the intrusiveness of these organisms.

> In 1924 Storm van Leeuwen from Holland suggested that inhaled fungal spores could cause asthma. To investigate this possibility the allergy department of St. Mary’s Hospital, Paddington, London obtained fungal cultures, which they intended to grow so that they could assess the effects and possibly test patients. Two seasonal and three non-seasonal fungi were cultured. One of these was the mould Penicillium. Directly above the allergy laboratory was Fleming’s laboratory. The bacteriological plate contai ning Staphylococci was contaminated by Penicillium, which may very well have originated in the allergy department downstairs. Therefore it can be said that it was the allergists’ interest in fungal spores that resulted in the dawning of the antibiotic age.
> [http://pollenuk.worc.ac.uk/Aero/FUNGI/allergy.htm]

THE KING AND QUEEN OF PSORA

• The allergic reactions, termed *psoric* in homeopathy, may be attributable, at least partly, to *sulphur* being a natural constituent of penicillins, ranging from 5% to 20%, depending on the type of penicillin. Sulphur has been crowned "King of Psora," apparently despite his ragged appearance, and has Psorinum, "the great unwashable," as his spouse. This raises an interesting question about the origins of Psorinum.
The proving substance for Hahnemann's Psorinum proving was the "sero- purulent matter contained in the scabies vesicle," i.e. the product of a secondary bacterial infection. Instead of as a bacterial remedy, however, Psorinum can also be classified as an arachnid since the vesicle presumably contained the scabies mite, which belongs to the class of arthropods, along with spiders, scorpions, crustaceans, etc. And finally, if the remedy is made, as Gross and three other provers did, from the epidermoid efflorescence of pityriasis, it should be considered a fungal remedy.
The third option gets my vote. Psorinum fits very well as type species for the *microscopic fungi* [moulds mainly], where the decreased vital force [or immuno-reactions] is implicated in the aetiology of type I and type III allergic responses, eczema and fungal dermatoses, bronchial asthma, and other allergenic conditions. Interestingly, the house-dust mite, cousin of the scabies mite, feeds on spores and mycelial fragments of moulds present in house dust.

ANAPHYLACTIC SHOCK

• Much more serious is *acute anaphylactic shock* which may, in some cases, be fatal.

> Severe fatal anaphylactic shock has been reported repeatedly in hypersensitive patients. Up to 1954 at least 83 severe and 46 fatal reactions had been reported. In such cases the patient experiences, often shortly after the administration of penicillin, a strange taste in the mouth, flushing of the face, vertigo, swelling of the face, lips, or eyelids, swelling and tightness in nose and throat, oppression in the chest, generalized itching, paraesthesias, and extreme anxiety.
> Sooner or later he loses consciousness and passes into collapse. The skin

turns ashen, cold, and clammy, the patient is covered with cold sweat, the pulse is rapid and thready, the blood pressure is low, sometimes not measurable, the respiration is shallow or stridulous, and there may be convulsive movements or frank convulsions. He may die from circulatory or respiratory failure.

[von Oettingen 1958]

OTHER ADVERSE REACTIONS

The intrathecal administration of penicillin has been followed repeatedly by severe nervous manifestations characterized by headache, vomiting, hyperreflexia, stiffness of the neck, spasticity of the muscles, convulsions with opisthotonos, and death. Following allergic reactions, excitement, restlessness, and hallucinations have been reported in rare cases. The intramuscular injection of penicillin, especially of large doses, close to a nerve trunk has resulted repeatedly in peripheral neuritis.

Other side effects following prolonged administration of penicillin are due to changes of the intestinal flora, resulting in the prevalence of monilia! [= candida] organisms that in turn may cause pruritus of the anal and vulvar region, glossitis, stomatitis, and general infections. The change of the intestinal flora may also result in deficiencies with regard to certain vitamins such as vitamin B and vitamin A, with their sequelae.

[von Oettingen 1958]

PENICILLIOSIS

• Penicilliosis is an infection caused by Penicillium marneffei, a species endemic to Southeast Asia and South-China. AIDS-patients are most susceptible to the infection, along with patients receiving immunosuppressive treatment and those with haematological malignancies. After initial pulmonary infection via inhalation, fungemia and disseminated penicilliosis develop, involving the lymphatic system, liver, spleen, and bones, and accompanied by acne-like lesions on face, trunk, and extremities. Clinical features of penicilliosis include fever [99% of cases], anaemia [78%], weight loss [76%], skin lesions [71%], lymphadenopathy [58%], enlargement of liver [51%], lung symptoms [49%], diarrhoea [31%], enlargement of spleen [16%], and oral lesions [4%].

[Data from: HIV Insite; http://hivinsite.ucsf.edu/Insite-KB-ref.jsp]

PENICILLIUM CAMEMBERTI **Penic-cm.**

Scientific name Penicillium camemberti Thom 1906.
Synonyms Penicillium candidum Link 1809.
Penicillium caseicola Bainier 1907.
Family Trichocomaceae.

KEYS

- Saprophytic mould.
- Camembert and Brie.

FEATURES

- White mould occurring as the whitish covering around Camembert or Brie cheeses and realizing the soft consistency of the cheese by secreting enzymes [hydrolysis of casein],
- Occasionally other fungi may occur as contaminants on Camembert cheeses: when *P. roqueforti* occurs as contaminant it imparts a bitter flavour; *P. brevicaule* and related varieties of fungi may produce a strong ammonia odour. [Gray]
- Saprophytic.

MYCOTOXINS

- Cyclopiazonic acid. [See P. cyclopium.]

PENICILLIUM CHRYSOGENUM **Penic-chr.**

Scientific name Penicillium chrysogenum Thom 1910.
Synonym By various authors considered as identical with Penicillium notatum [Roth; Kirk].
Family Trichocomaceae.

FEATURES

- Forms slow-growing colonies with a grass green to bluish green colour with a yellow margin and yellow drops of exudate on the surface.
- Saprophytic.
- Dustborne; commonly found in house dust.
- Cultures of this species are used to produce natural and semi-synthetic penicillin-type antibiotics.
- Potent contact sensitizer.

MYCOTOXINS

- Penitrem A [neurotoxin and tremorgen]; citrinin [nephrotoxic; vasodilatation; bronchial spasms].
- Citrinin was discovered during the 1940s and considered then to be potentially valuable antibiotic. Like several other Penicillium metabolites, it proved to be too toxic for therapeutic use, and became known in time as a potentially hazardous mycotoxin. The compound causes watery diarrhoea, increased water consumption, reduced weight gain, and kidney degeneration in chickens, turkeys, and ducklings.
- The symptoms of penitrem A are essentially the same as those of a range of other fungal tremorgens, such as Claviceps paspali and Neotyphodium [formerly Acremonium] lolii. In laboratory animals, the main symptom of poisoning by penitrem A is the onset of sustained trembling, which may continue for long periods without appearing to interfere with the normal functions of the animal.

PENICILLIUM CYCLOPIUM **Penic-cy.**

Scientific name Penicillium cyclopium Westling 1911.
Synonym Penicillium aurantiogriseum Dierckx 1901.
Family Trichocomaceae.

KEYS
• Nephropathy.

FEATURES

- Occurs on cereals, cereal products, and mouldy meat products.
- Saprophytic.
- Produces an orange pigment.

MYCOTOXINS

- Ochratoxin A.

Nephrotoxic coumarin derivative produced by seven species of Penicillium, including P. cyclopium, and six species of Aspergillus, including A. ochra- ceous. Causes delay of sexual maturity and decreased egg production in pullets.
Causes necrotic nephropathy in pigs. It was first described in 1928 in Denmark. In the 1970s a significant proportion of ingested ochratoxin A was found to lodge unchanged in deposited fat in pigs. The high consumption of pork and bacon, as in some rural areas of Denmark, has been associated with increased death rates from kidney failure.
Causes chronic kidney disease in humans termed Balkan endemic nephropathy. The syndrome begins insidiously between ages 30 and 60 years, particularly in females. Onset is never acute. The earliest and most frequent complaints include headache, lassitude, easy fatigue, and anorexia. The typical syndrome includes a shallow, copper-coloured skin, yellowing of the palms and soles, anaemia, and occasional haematuria. Special clinical features are the absence of oedema, the rarity of hypertension, and the presence of severe anaemia. Malignant urinary system tumours are found in 30 to 40% of affected patients. [Merck Manual]

- Cyclopiazonic acid has shown neurotoxic activity and affects, in laboratory animals, the pancreas and spleen.
- Patulin. General cytotoxin with haemorrhagic effects. It causes haemorrhages, formation of oedema and dilatation of the intestinal tract in experimental animals due to its antibiotic properties.
- Penicillic acid has antibiotic properties but has shown carcinogenic action in laboratory animals.
- Rugulosin is hepatoxic and carcinogenic.

PENICILLIUM EXPANSUM **Penic-e.**

Scientific name Penicillium expansum Link 1809.
Synonym Penicillium glaucum Stoll 1809.
The specific name *glaucum* [from Gr. glaukos, grey-green] formerly included all green species of Penicillium. Since greenness would apply to a hundred or so species, the name is invalid to indicate a particular species. It is now regarded as a synonym of Penicillium expansum.
Family Trichocomaceae.

KEYS
- Grey-green saprophytic mould.
- Spoilage of stored fruits.
- Invades damp places; indicator organism for dampness indoors.
- Inhabits refrigerators.
- Pains < damp stormy weather, > dry sunny weather.
- Similar to Rhus toxicodendron.

FEATURES

- One of the cosmopolitan moulds, along with Aspergillus niger and Rhizopus nigricans, which are so omnivorous by virtue of their ability to produce a large number of enzymes, representing each of the groups: carbohydrases, proteases, lipases, oxidases, and reductases. This makes it possible for them to utilize many kinds of substrates as foods.
- Occurs, under suitable conditions of temperature and moisture, on almost any plant remains, on plant products, such as bread, fruit juices or jam, or on substances of animal origin, such as cheese or leather, as well as attacking wallpaper, paints and paintings.
- Responsible for considerable losses of stored citrus, apples and pears.
- Source of enzymes suitable for the clarification of cider.
- Common contaminant of fruit juices, particularly apple juices, worldwide.
- Wound invader [insect stings; harvesting] on stone fruits, causing spoilage [brown rot].
- Common inhabitant of refrigerators.
- Saprophytic.

• Secretes acids that enhance the weathering [erosion] of sandstone and mineral ores.

MYCOTOXINS

• Patulin [see P. cyclopium]; citrinin [nephrotoxic and antibiotic]; roquefortine.

MATERIA MEDICA

“ Penicillium species are the first to invade damp places and they can serve as indicator organisms for dampness indoors. Consequently, the re-papering of a house during damp weather provides them with both the ideal conditions and the proper substrate for unlimited expansion, as Whiting observed in an article describing his experiences with Penicillium as a remedy. It should be noted that what he calls “mildew” is in fact a mould and that “glaucum” is no longer an accepted specific name.

Penicillium glaucum

It is a remarkable thing that the common mildew [Penicillium glaucum], which spoils so much that is useful to us, should have so long escaped the attention of homeopaths as a possible remedy for disease.

About fifteen years ago my interest in this matter was aroused owing to a group of people inhabiting a house [which had been re-papered during damp weather], who were suffering from severe neuralgic pains of a like character. On examination of the walls of the house I found them covered with mildew, the spores of which had ripened and were doubtless being carried in the atmosphere.

I had a trituration made of the entire fungus - triturating for four hours for the lx and then on to the 6x; afterwards by dilution up to the 50x. It has proved a very valuable remedy in my hands for neuralgia, neuritis, toothache, etc.; and the following list of symptoms have been caused or cured by the medicine. The most potent potency in my hands has been the 6x although in some cases I have used much higher ones with good results. When indicated it acts very quickly and it is a good associate of Rhus tox. of which it is a complement, also of Pulsatilla and Mercurius. The pains are < at night and in damp stormy weather, > by pressure and warmth and in dry sunny weather.

Head.

Sharp pain in forehead over the left side.

Pain the occipital region and just below, < on awakening and in the evening.

Mouth, etc.

Toothache, aching, upper right side, changing from place to place. Sometimes in the lower jaw. < Hot or cold drinks or food. Pain extends to head [occiput], cheek and neck: teeth feel too long. Incisors feel on edge. Indisposition to talk. Intermittent neuralgic pains.

Chest.

Pain in right side of wall of chest.

Grey-green saprophytic mould. Spoilage of stored, fruits. Invades damp places; indicator organism for dampness indoors. Inhabits refrigerators. Pains < damp stormy weather, > dry sunny weather, > pressure. Similar to Rhus toxicodendron, Pulsatilla and Mercury.

Neck and Back.

Painful swelling in glands of the neck below the ear. Aching in side of neck. [Chiefly on the right side]. Rheumatic pains in the muscles and small of the back.

Extremities.

Shooting pains in various parts of upper and lower extremities < night. Pain on ball of right shoulder < night, and light motion, > pressure and warmth. Pain in right shoulder and interior of right upper arm and forearm. Pain in left shoulder and arm. Aching in fingers and fingertips. Numbness of hands, arms, and legs in bed at night. Violent cramp in right leg at night. Intermittent pains in the legs.

Generalities.

Rectum: stabbing pain up rectum. Proctitis: greatly helped by alternation with Rhus tox. Chronic eczema has been helped with Penicillium. Pronounced deposit of lithates in the urine. The remedy is often helped by an intercurrent dose of Rhus tox., and conversely, when the latter is indicated but does not act well, a dose of Penicillium will often stimulate its action.

[Homoeopathy, Vol. IV, No. Il, November 1935; in: ReferenceWorks Pro.]

PENICILLIUM GRISEUM **Penic-g.**

Scientific name Penicillium griseum Bonord. 1864.
Family Trichocomaceae.

NOTE: It was suggested in 1923 that this species might have been Dierckx's Penicillium griseofulvum but that it more probably was P. digitatum Sacc. on account of the large spores. No one therefore knows what Bonorden's species was.

PENICILLIUM GRISEOFULVUM **Penic-gr.**

Scientific name Penicillium griseofulvum Dierckx 1901.
Family Trichocomaceae.

NOTE: There is, as far as I could find, no reference in mycological literature to a Penicillium species with the specific name *griseum.* Instead, two organisms are listed whose specific names refer to griseum: P. aurantiogriseum [see above] and P. griseofulvum.
The latter species is here included because its secondary metabolite, griseo- fulvin, is an important narrow-spectrum antifungal antibiotic widely used in the treatment of recalcitrant dermatophyte infections [tineas]. The drug contains chlorine.

FEATURES

• Saprophytic.

MYCOTOXINS

- Verrucosidin.
- Penicillic acid.
- Cyclopiazonic acid. Originally isolated from P. cyclopium and subsequently found to be produced by numerous species of Penicillium and Aspergillus. Natural occurrence of this compound has been reported in corn,

peanuts, cheese, sunflower, millet, chicken meat and eggs, and sheeps milk. Cyclopiazonic acid has shown neurotoxic activity.

- Tremorgens [tremortin A and B].

GRISEOFULVIN

• Griseofulvin is produced naturally by Penicillium griseofulvum and P. janczweskii. It can be considered a mycotoxin because it has the effect of killing other fungi in the soil. It was isolated and named in 1939 and was originally used as a systemic fungicide in plant pathology beginning in 1947. In 1958, it was used orally in humans and animals to treat tineas and is still used for that purpose. Griseofulvin disrupts proteins in rapidly dividing young fungal cells but has less effect on older more dormant elements. It is inactive against yeasts, such as Cryptococcus, and yeast-like fungi such as Candida, Blastomyces, Histoplasma, Malassezia, etc.

Because griseofulvin resembles colchicine [active ingredient of Colchicum autumnale] structurally, it has been used, in large doses [6 to 10 g] to treat gout, with some benefit. [Colchicine is a mitotic poison. It arrests plant and animal cell division, cells with the highest rates of division being affected earliest.]

In the human body it is taken up selectively by newly formed skin and is deposited into keratin, the building material for nails and hair. Thereby the resistance of keratin is increased to the keratinophilic Trichophyton [tinea] spp. The antibiotic is better absorbed when taken with a high-fat meal. The plasma half-time of the drug is 24 hours, but in the skin it is retained much longer. Treatment of tineas with griseofulvin needs to be very prolonged to be effective. This increases the possibility of unwanted effects.

ADVERSE REACTIONS

• "The incidence of serious reactions associated with the use of griseofulvin is very low," claim Goodman and Gilman. "Among the minor effects, the incidence of which may be as high as 15%, is *headache* that is sometimes severe and usually disappears as therapy is continued."

Although "usually mild and transient," the following side-effects have been reported.

Neurologic:

Fatigue; confusion; depression; impaired judgement; impairment of performance of routine efforts; auditory hallucinations; insomnia; ataxia; dizziness; headache; paraesthesia; peripheral neuritis.

Disulfiram-like reaction with alcohol, *[see* Coprinus]

Dermatologic:

Rash; urticaria [cold and warm]; photosensitivity [patients are advised to avoid exposure to intense sunlight]; angioedema; erythema multiforme; pemphigus; bullous lesions; exfoliative dermatitis; vesicular and morbilliform [measles-like] eruptions; lichen planus; hyperpigmentation.

In 12 patients with Raynaud's disease a rise in skin temperature of 1.3° C was recorded when given griseofulvin 0.5 to 2 g daily compared to a rise of 0.9° when given placebo.

Alimentary canal:

Altered taste; dryness of mouth; stomatitis; black, furred tongue; burning or painful tongue; heartburn; flatulence; nausea; vomiting; diarrhoea; thirst.

Haematological:

Leukopenia; granulocytopenia; punctate basophilia; porphyria.

Ocular:

Blurred vision; retinal oedema; vision colour changes [green tinge].

Renal:

Proteinuria; cylindruria.

Hormonal:

Oestrogen-like effects in children [abnormalities of sexual organs and breasts].

Miscellaneous:

Lupus-like syndrome; anaphylaxis; candidiasis; foetal harm [crosses the placenta; conjoined twins and mongolism noted in humans]; decreased effect of oral contraceptives; decreased effect of anticoagulants.

[Goodman & Gilman 1970; Arena 1974; Martindale 1977; Leikin & Paloucek 1998]

Scientific name Penicillium notatum Westling 1911.
Synonym Penicillium chrysogenum Thom 1910.
Family Trichocomaceae.

PENICILLIUM NOTATUM

Penic-n.

FEATURES

- Occurs worldwide in soils, on foodstuff and animal feed.
- Saprophytic.
- Probably identical with Penicillium chrysogenum.

MYCOTOXINS

- Citrinin; roquefortine; penicillin.

PENICILLIUM PICEUM

Penic-p.

Scientific name Penicillium piceum Raper & Fennell 1948.
Family Trichocomaceae.

KEYS

- Yellow saprophytic mould.
- Skin irritation and sensitization.

FEATURES

- Saprophytic.
- Occurs on mouldy “yellow” rice and other grains, producing the anthraquinone luteoskyrin, which may cause skin irritation and sensitization.
- Luteoskyrin is carcinogenic as well as a liver and kidney toxin.

PENICILLIUM ROQUEFORTI **Penic-r.**

Scientific name Penicillium roquefbrti Thom 1906.
Family Trichocomaceae.

KEYS

- Dark green to dark blue-green saprophytic mould.
- Fast growing.
- Grows under conditions of high carbon dioxide and low oxygen concentrations.
- Blue-veined cheeses.
- Allergic reactions similar to those evoked by shellfish.
- Tremors.

FEATURES

- Ubiquitous, saprophytic fungus frequently found on decomposing organic material.
- Fast-growing, dark green to dark blue-green.
- Common in temperate climates, but grows also well at low temperatures and in atmospheres of 80-90% carbon dioxide.
- Occurs on all kinds of foodstuff, bread, fats, malt, fruit juices, and on cork [cork stoppers of wine bottles, giving a “corky” taste to wine].
- Regarded as one of the most important fungal contaminants of carbonated beverages, beer, wine, cheese, eggs, and meat products.
- Common inhabitant of refrigerators.
- Used in the production of blue-veined cheeses [Roquefort, Gorgonzola, Stilton, etc.]. Imparts a piquant flavour to these cheeses by hydrolysis of the butter fats, which produces such volatile acids as caproic, acetic, butyric, and capric.

> Although the ripening process as in Camembert type cheeses involves the growth of a fungus, in Roquefort the mycelium grows throughout the curd, rather than being restricted to a superficial growth on the rind as in Camembert. The fungus principally involved in the ripening of Roquefort cheese is *Penicillium roqueforti,* which, according to Thom and Currie [1913], occurs in practically pure cultures in this type of cheese. These

investigators also reported that both Gorgonzola and Stilton cheeses likewise contain *P. roqueforti* in fairly pure condition.

Since oxygen disappears and carbon dioxide is formed in considerable quantities within the curd during the ripening process, the question naturally arises as to how an organism as highly aerobic as a filamentous fungus is capable of growing in the interior of the curd under conditions of high carbon dioxide and low oxygen concentration.

Thom and Currie provided the answer by demonstrating that *P. roqueforti* has the capacity to grow under conditions of high carbon-dioxide concentration and low oxygen concentration far beyond the capacities of other species of *Penicillium* and *Aspergillus.*

These workers tested 22 species of *Penicillium* and *Aspergillus* and found that in an atmosphere containing 75% carbon dioxide and 25% air, only *P. roqueforti* was able to form fairly strong colonies. Thus it would appear that this species of *Penicillium* is dominant in Roquefort cheese because most other fungi cannot grow under the conditions of low oxygen concentrations existing in the open spaces in the cheese.

[Gray 1959]

MYCOTOXINS

- Roquefortine A, B, and C; mycophenolic acid [antibiotic]; patulin.
- Produces under some conditions a dangerous but unstable mycotoxin termed PR toxin, although it appears not to be formed during the cheesemaking process.

PR toxin has caused abdominal bloating, decrease of motor activity and respiration rate, weakness of the hind legs and ataxia in mice and rats.

- Mycophenolic acid has antibiotic properties and has been used in the treatment of psoriasis. Prolonged administration to humans resulted in adverse reactions such as cramps, nausea, and diarrhoea.
- Penicillium species are most often incriminated in producing tremorgenic mycotoxins; the most common are penitrem A and roquefortine C. Vomiting often precedes the earliest tremors, which may help limit the severity of illness.

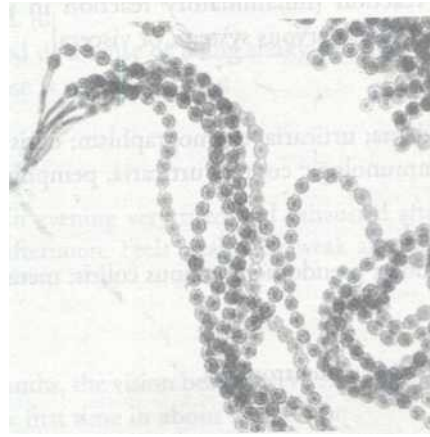
EFFECTS

• Roquefortine C intoxication in cattle by grain heavily contaminated with P. roqueforti has resulted in reduced fertility, bovine abortion, placental retention, mastitis, extensive paralysis, and ketosis [excess of acetone formation due to incomplete oxidation of fats, as for instance in diabetes].

• Allergic reactions from eating blue-veined cheeses are not uncommon. The reactions are similar to those evoked by shellfish and include urticaria eruptions around the mouth, numbness of the lips, swelling of the tongue, and increased or decreased bowel movement.

• The tremorgen Roquefortine C may cause slight intention tremor in some people. One patient said, I have to choose either to eat blue cheese or to drink alcohol. If I do both, I can't drink without spilling or even missing my mouth entirely."

Dark green to dark blue-green saprophytic mould.
Fast growing.
Grows under conditions of high carbon dioxide and low oxygen concentrations.
Blue-veined cheeses.
Allergic reactions similar to those evoked by shellfish.
Tremors.



Penicillium [20 pm]

PENICILLINUM **Penic.**

Pharmaceutical name Benzylpenicillin Sodium. Penicillin G Sodium.
Use Active against most gram-positive organisms [except *Staphylococcus aureus],* some gram-negative such as *Neisseria gonorrhoeae* and some anaerobes and spirochetes. Many staphylococci are now resistant against this type of penicillin.

KEYS
- Allergic hypersensitivity reactions.
- Dermatologic symptoms.
- Feeling of icy coldness.
- Abuse of penicillin.

ADVERSE REACTIONS

CNS:
Convulsions; anxiety; confusion; drowsiness; fever; hyperthermia; Jarisch-Herxheimer reaction [inflammatory reaction in syphilitic tissues: skin, mucous membrane, nervous system, or viscera].

Dermatologic:
Rash; angioedema; urticaria; dermographism; cutis laxa; systemic contact dermatitis; immunologic contact urticaria; pemphigus.

Alimentary canal:
Nausea; diarrhoea; pseudomembranous colitis; metallic taste; oesophagitis.

Haematologic:
Haemolytic anaemia; neutropenia.

Hepatic:
Granulomatous hepatitis; cholestasis.

Respiratory:
Asthma; bronchospasm.

Miscellaneous:

Thrombophlenitis; periarteritis nodosa; hypersensitivity reactions, anaphylaxis [0.05% frequency with injection], total allergic reactions [1% to 10%]; lymphadenopathy.

[Leikin & Paloucek 1998]

MATERIA MEDICA

Provings

[1] Guermonprez; 12 provers [9 males, 3 females]; 7c and 9c; three to six weeks; 1950.

[2] Macfarlan; 200c; number of provers unknown; proving was made "on provers who did not know they were making provings; in all cases their health was improved."

SYMPTOMS

Mind

= Increased cerebral activity, quickly followed by *considerable asthenia.* [G]

" Everything seems sad. [G]

" Either easily disturbed or a sense of being shaky internally, and tense. [M]

= Fidgety when the nose is stopped up. [M]

Energy

= *Low.*

Very, very tired. In evening very tired and exhausted after doing a little shopping in the afternoon. Feels weak. Felt weak all over and exhausted for 2 days. [M]

Sensory

= "For first time in months, the vision became very clear. Could read numbers from hymn board for first time in about a year." [M]

" "When she read her eyes felt tired. They felt as if they were being pulled. She noted that the sunlight was harder to get used to." [M]

Sleep

" Heavy or light sleep, waking in the early morning, around 4 a.m., accom-

panied by feeling of discomfort. [G]
<» Afternoon drowsiness. [M]
« Sleeps in fits and spells all night until 4:30 a.m. [M]
=» Amelioration after sleep or aggravation after sleep. [M]

Temperature
= *Chilliness; feeling of icy coldness in different parts of the body,* especially the thorax and the loins. [G]
~ Extremities cold, & paraesthesia. [G]

Appetite - digestion
·» "Was hungry all day long, and was especially keen for lunch. She felt as if she wanted to eat something sweet. [This is unusual, the amount of this desire.] [M]
=· Increasing sense of fullness after evening meal. Rather puffed after eating. [M]
= Thirst in middle of the night. [M]

Cardiovascular
= Ecchymosis. [G]
— Flushing of face in evening; sudden, in late afternoon; redness of face; followed by paleness of face; & dull, constant frontal headache; & rapid heart beat, in afternoon, followed by pressure on vertex and occiput. [M]
= Hot flashes from mid chest upward in afternoon but for a short time only. The area is reddened. [M]
= Hot flashes from abdomen up in afternoon. [M]

Respiratory
=> *Dry, hoarse cough,* sometimes paroxysmal, making the patient bend forward, > rest. [G]
~ *Asthmatic dyspnoea* at 4 a.m. [G]
«· Distressing asthmatic breathing with difficult secretion. [M]
= Out of breath on walking fast in morning. [M]
— Difficulty taking a deep breath due to soreness and pain around the heart. [M]
= "At 4:40 a.m. had a bad spell in bed. Could hardly get her breath. It felt as if something were closing her throat. Awoke so suddenly she thought

she was hit. Better by lying still. This lasted one hour. Felt all right at 8 a.m." [M]

Discharges

~ Nasal discharge thick, yellow [GJ; "perfectly white" [M].
= Nose ran very freely after drinking water. [M]
=> "Nose would run dreadfully, just thin watery mucus, it would come in spells [the running]; could hardly get up her handkerchief in time." [M]
« Discharge of blood and pus from the nose, off and on. [M]
" Discharge from nose & obstruction of nose. [M]
■> Watery rhinorrhoea, nocturnal and profuse. [M]
<■ Sputum thick, yellow or whitish-yellow. [G]
~ Leucorrhoea *yellow* or *white,* bland. [G]
«· Menses *late* and scanty. [G]
« Urine scanty. [G]
« Warm or cold sweat, with a stale odour. [G]

Allergic and hypersensitivity reactions. Dermatologic symptoms. Feeling of icy coldness. Abuse of penicillin.

Dermatologic

"Boils [recurrent]; skin diseases; warts; weeping eczema [muco-purulent]; urticaria. [G]
-*Acne.* [G]
" Boils, especially on the face, & oedema. [G]
" Herpetic eruption on face. [G]
" Boil or eczema in the auditory canal. [G]
" Itching of whole body in morning. It was very marked. [M]
" Itching around the neck when getting undressed at night. [M]
" Itching around face and neck in evening. [M]
" At night itching around the waist. [M]

Modalities

" Worse: Cold and damp; motion; 4 a.m. [G]
" Better: Rest; warmth; dry weather. [G]

Sensations

" Eyes feel as if they were pulled, when glancing sideways. [M]
" Swollen sensation at back of nose at throat area. [M]
" Sensation of weight on front of chest; & rather sharp pains in left arm and

under left shoulder blade. [M]
= In afternoon, a strange feeling of weight and numbness in the second and third right toes. [M]
«■ Feeling as if needles were sticking into the right toe. [M]
= Tingling sensation in legs and feet at intervals, especially when sitting. [M]
« Feels a crushing and squeezing pain through body, as if from cold. [M]

Pains
= Coming and going; sharp aching.

Locals
= Right-sided headache; neuralgic pain above and behind the right eye. [G]
~ Dull pain shooting through head on right side, starting from the back and going to the vertex. [M]
·» Frontal headache with sinusitis. [G]
<■ Head *heavy, 6c* nausea, < movement, > lying down and resting, > eating. [G]
= Slowly appearing styes. [G]
= Puffiness of lower eyelids in morning. [G]
■> Puffiness of eyes in morning. [M]
= Obstruction of nose when it first gets cold. [M]
<·< Obstruction of nose preceded by sneezing; much sneezing at night. [M]
■> Dryness of mouth, with or without thirst. [M]
= Pain in upper right incisors and canines, extending to right maxilla. [G]
= Wants to clear throat often, due to sticky mucus in larynx. [M]
= Painless hoarseness, < morning; it is an effort to talk. [M]
« Pain in kidneys, extending to lumbar and sacral regions; scanty urine. [G]
= Backache, rather sharp, lower middle area; pretty constant, lasting all day; > lemon juice. [M]
== *Joint pains,* & swelling of muscles and lumbar region, < slightest movement. [G]
= Hands and feet puffed with pressure. Puffed up in hands in morning. [M]
= Numbness in right hand and right foot. [M]

Clinical
— Predisposition to allergy. [J]
= Hypothyroidism; myxoedema. [J]
~ Climacteric psychosis, [j] [Repertory: Sadness during menopause.]

“ Acrocyanosis [circulatory disorder in which the hands, and less commonly the feet, are persistently cold and blue; related to Raynaud’s phenomenon]. J]
« Chronic thrombocytopenia. [J]
“ Henoch-Schbnlein purpura [nonthrombocytopenic purpuric lesions & joint pain and swelling, colic, and passage of bloody stools; occurs characteristically in young children]. [J]
« Acute articular rheumatism; chronic polyarthritis; rheumatic or tubercular pericarditis. J]

[J] = O.A. Julian, Materia Medica of New Homoeopathic Remedies; Beaconsfield 1984.
[G] = Guermonprez, in Julian.
[M] = Donald Macfarlan, A Proving of Penicillin; Journal of the American Institute of Homeopathy, August, 1957.

Small rubrics
Penicillinum is represented in 12 small rubrics:

= HEARING, lost, accompanied by chronic diarrhoea.
“ HEARING, lost, accompanied by fever.
“ NOSE, inflammation, purulent.
“ MOUTH, papillae of tongue absent.
== THROAT, inflammation tonsils, follicular.
“ CHEST, heart complaints accompanied by thyroid complaints.
= GENERALS, Allergic constitution; allergic to antibiotics.
=> GENERALS, Collagen disease.
= GENERALS, History, personal; history of recurrent boils.
= GENERALS, Laboratory findings; platelets decreased.
== GENERALS, Myxoedema.
» GENERALS, Weather; warm, dry weather >.

IL ORDER ONYGENALES

Contains 120 species in 40 genera.

The order comprises some unusual fungi that cause skin disease in people, and can digest hair, horn and feather due to their typical ability to metabolize the protein keratin. Keratin differs from other fibrous structural proteins chiefly by their high cystine content [nonessential amino acid containing sulphur].

II A. FAMILY ARTHRODERMATACEAE

Trichophyton depressum
Trichophyton persicolor
Trichophyton rubrum
Trichophyton tonsurans
Ringworm

KEYS

- Keratinophilic filamentous moulds.
- Dermatophytes on man and animals.
- Rare examples of fungi that are highly contagious.
- Confined to outer skin layers; rarely invade living tissues.
- Causative agents of tinea [ringworm].
- Exclusion from social contacts.
- Tuberculinic miasm.

FEATURES OF THE GENUS TRICHOPHYTON

- Genus of about 20 species of keratinophilic filamentous moulds.
- Usually occurring as dermatophytes on man and animals but occasionally isolated from soil, leather, feathers, etc.
- Dermatophytes are rare examples of fungi that are highly contagious.
- Able to invade keratinized tissues; possess several proteinases [keratinases]

as their major virulence factors.

- Usually confined to the outer layers of skin, hair, and nails; rarely invade living tissues.
- Colonies have a slow to moderately rapid growth rate.
- Trichophyton species may cause invasive infections in immunocompromised hosts.
- Achorion is an obsolete synonym of this genus.

RINGWORM

- Some Trichophyton spp., along with Microsporum and Epidermophyton spp., are the leading causes of hair, skin, and nail infections in humans known as ringworm or tinea.
- Termed ringworm because of the original belief that the infection was caused by parasitic worms burrowing beneath the skin in a ring-shaped manner.
- The name *tinea* refers to the clothes-moth genus Tinea, the worms of which make round holes in woollen blankets that resemble the rounded lesions seen on the skin of humans.
- Most common are Trichophyton mentagrophytes [syn. T. depressum], T. rubrum, T. schoenleinii, T. tonsurans, T. verrucosum, and T. violaceum.
- Once the fungus is established, it spreads out in red rings of small vesicles or of scaly skin.
- Incidence higher in people with heavy perspiration.
- Sunbath is considered an "ideal treatment to kill the fungus."

About half of the dermatophytes are found only on people, causing diseases commonly called *tinea.* These have no reservoir of infection in the soil or on animals: they can grow only on humans, although their arthric conidia can survive in carpets and upholstery for up to two years. Many of the rest are usually isolated from other mammals. *Microsporum canis* has its reservoir in the cat. It may move to dogs or humans, but will die out after one or two person-to-person transfers. If it is to survive, it must return to the cat for rejuvenation.

About five species are recorded from both man and animals. The irritation caused by the presence of the fungus stimulates the epithelial cells of the host to divide more often than usual. This increases the amount of keratin available to the fungus, and also means that more flakes of skin containing

> infective mycelium will be shed. ... It must be emphasized that these fungi are growing on living tissue. Their clinical effects are due to the various irritants they produce; enzymes such as proteases, peptidases and elastases, and other metabolites. The condition is really a form of toxic dermatitis. [Kendrick 2000]

History

In Book V of the encyclopedic compilation *Artes* [The Sciences], Aulus Cornelius Celsus [1st century AD] drew attention to the boggy inflammatory lesions of some ringworm infections - the condition known ever since as 'the kerion of Celsus'. In Book VI he described favus:

> ... the condition is called porrigo, when between the hairs something like small scales rise up and become detached from the scalp; and at times they are moist, much more often dry. Sometimes this happens without ulceration, sometimes there is localized ulceration, and from this comes sometimes a foul odour, sometimes none. This generally occurs on the scalp, more seldom the beard, occasionally even on the eyebrow.

In the centuries that followed the term 'porrigo' was used to cover various skin disorders and the Latin 'tinea' was applied in a generic sense to ringworm.

There are records of the Tudors granting licenses under the signet for loyal sufferers from ringworm to remain covered in the king's presence and on other ceremonial occasions and Samuel Pepys in his diary for 17 June 1665 recorded thrush [Candida infection] as one of the terminal symptoms of Admiral Sir John Lawson. During the last decade of the 17th century the English antiquary John Aubry compared fairy rings and ringworm:

> As to the green circles on the downes, vulgarly called faiery circles [dances], I presume they are generated from the breathing out of a fertile subterranean vapour. [The ring-worme on a man's flesh is circular. Excogitate a paralolisme between the cordial heat and ye subterranean heat, to elucidate the phaenomenon.]

A pertinent comparison in spite of his incorrect explanation tinged with the doctrine of humours.

About the same time Sir William Damper, when voyaging round the world, wrote in his journal after a visit to the Philippines in 1686:

> The *Mindanao* People are much troubled with a sort of Leprosie, the same as we observed in *Guam.* This Distemper runs with a dry scurf all over their Bodies, and causeth great itching in those that have it, making them frequently scratch and scrub themselves, which raiseth the outer Skin in small whitish flakes, like the scales of litde Fish, when they are raised on end by a Knife. This makes their skin extraordinary rough.

Tinea has been illustrated by a number of old masters. In Murrillo's [1617- 1682] painting in the Hermandad de la Santa Carida, Seville, of St Elizabeth of Hungary washing the head of a child with another standing by her side scratching himself, both children appear to be suffering from favus, as does the boy being considered for admission to the Amsterdam Leprosy House in the painting by Ferdinand Bol [1616-1690] in the Rijksmuseum. Since Biblical times favus and leprosy have been confused and some of the clinical dermatology in *Leviticus* 13 could possibly be interpreted as an attempt at the differential diagnosis of these two conditions.
[Ainsworth 2002]

Not only will leprosy and favus have been confused, it is also highly unlikely that leprosy was distinguished from certain deforming systemic mycoses. The translation in the Old Testament of the Hebrew word zara'ath with leprosy may be called in question because zara'ath was also used for various dermatological conditions producing disfiguring ulcers and sores, suggesting that it referred to uncleanness.

The term leprosy served as a general description rather than a medical diagnosis, and for Christian thinking provided a stigmatizing punishment for sin and lust. Furthermore, true leprosy is caused by *Mycobacterium leprae,* a bacillus closely allied to the tubercle bacillus *Mycobacterium tuberculosis.* Since the symptoms of fungal diseases, pulmonary, dermatologic or otherwise, bear a close resemblance to those of TB, the same will be true for mycoses and the clinical features of leprosy.

It is doubtful, for that matter, whether the repertory rubric "Skin, eruptions, leprosy," refers to true leprosy, which seems highly unlikely considering the remedies in the rubric, instead of to any disfiguring skin lesion.

Manifestations

• The various types of tinea are named after their location.

Tinea capitis is ringworm of the scalp. It mainly affects children and is uncommon after puberty. It begins as a small papule and spreads peripherally leaving fine, scaly, circular patches of temporary baldness. Infected hairs become brittle and break off easily.

Affected areas show characteristic black dots resulting from broken hairs. The hair of eyebrows and eyelashes may be involved. Tinea capitis may extend to tinea corporis. Sources: humans, animals, especially dogs, cats, and catde. Incubation period: 10-14 days. Occurrence favoured by overcrowding, poor hygiene and protein malnutrition.

Tinea corporis is ringworm of non-hairy areas of the body, appearing as flat, ring-shaped lesions which are dry and scaly or moist and crusted when containing fluid or pus. The borders of the patches are usually slightly raised above the level of the surrounding skin. Infection may be acute with sudden onset and rapid spread, or chronic with slow extension of a mild rash and prominence in body folds. The lesions heal centrally. Males are infected more than females.

The infection is contagious. Many adults acquire tinea corporis from infected children, but tinea capitis is rare in adult contacts. Sources: humans, animals; for example, cattle, kittens, puppies, guinea pigs, mice, horses, and soil. Transmission of tinea by animals commonly affects exposed areas like the face, neck and arms, whilst anthropophilic organisms classically affect covered areas of the skin or areas of trauma.

Incubation period: 4-10 days. Aggravated by friction and excessive perspiration in axillary and inguinal regions, and when environmental temperatures and humidity are high. Between 3 to 4% of tinea corporis cases present with an erythematous, scaly rash on the face with or without telangiectasia, atrophy, and aggravation by sunlight. This clinical form, called tinea fasciale, may be confused with lupus erythematosis.

The species most commonly responsible for tinea corporis are Trichophyton rubrum, T. mentagrophytes, and Microsporum canis.

Tinea cruris is ringworm of the groin, also known as tinea inguinalis, trichophytosis cruris, dhobie or jock itch, gym itch, and eczema marginatum.

It occurs in the genitocrural region, including the inner side of the thighs, the perineal region, and the groin.
It begins as a small erythematous scaling or vesicular area, which spreads with partial clearing in the centre. Lesions have typically irregular borders that have many small vesicles. Flare-ups occur more often during the summer. Tight clothing, obesity, and heavy sweating tend to favour growth of the fungi. Extension to the pubic area, lower abdomen, and buttock occurs rarely but can be seen, especially if Trichophyton rubrum is the causative agent.

Tinea pedis or athlete's foot affects the feet. An itchy, scaly and red rash usually starts between the toes and develops into cracked, blistered skin. The blisters contain a thin watery fluid. Eroded areas appear between the toes and on the soles of the feet. Adults are affected more often than children; males more than females.
Infection is more frequent and severe in hot weather. Associated with the use of occlusive shoes and with contact with bath or pool floors. Commonly caused by Trichophyton rubrum and/or T. mentagrophytes. Reservoir: humans.
Tinea pedis with a papulosquamous pattern ["moccasin-like"] affects the soles and lateral aspects of the feet over the area of skin that might be covered were one wearing a moccasin.

TINEA
Tinea capitis - scalp
Tinea corporis - body [non-hairy parts] Tinea cruris - groin, genitals
Tinea pedis -feet Tinea unguim - nails Tinea barbae - heard

Scaling is the main process while inflammation is minimal. This type is usually bilateral and may present with concomitant involvement of one hand in a pattern called "one hand, two feet."

Tinea unguim is a chronic fungal infection involving one or more nails of the hands or feet. The nail gradually thickens and becomes yellow, brittle and crumbling. Infected nails show pitting and split laterally. Caseous-looking material forms beneath the nail, or the nail becomes chalky and disintegrates. Contagious. Caused by T. rubrum and other species. Reservoir: humans; rarely animals.

Tinea barbae is ringworm of the bearded areas of the face and neck, and hence restricted to adult males. The most common causes are T. mentagrophytes and T. verrucosum. It occurs as a follicular infection or as a granulomatous lesion. Hairs become loose, brittle, and lustreless. Cases of the

inflammatory type usually cause unilateral involvement of the chin, neck or maxillary area with upper lip sparing. Nodular lesions covered with crusts and seropurulent material end up having an abscess-like appearance. Permanent alopecia and important scarring may be the final consequences. Also called barbers itch; folliculitis barbae; tinea sycosis; trichophytosis barbae. [Extracted from: websites MycologyOnline and DoctorFungus]

ID Reaction

• ID eruptions or mycides are fungus-free skin lesions, often on the hands, that occur during an acute vesicular or inflammatory ringworm infection. These lesions, often occurring on the dominant hand [i.e. right-handed or left-handed], are thought to be an allergic reaction to a remote focus of mycotic infection.

> In 1912 Jadassohn made the interesting observation that primary localized infections [mycoses] by species of Trichophytoneae may be accompanied by secondary lesions [mycides] on distant parts of the body in which no fungus can be found. These mycides have come to be designated as tri- chophytides, epidermophytides, microsporides, etc., depending upon the genus responsible for the primary lesions.
>
> Jadassohn explained this phenomenon as an allergic reaction, since he found that rubbing the spores into the skin of other children could produce secondary lesions. This external origin of mycides, however, has not been substantiated in subsequent investigations. Instead they have been determined to arise from spores or toxic products of the pathogen liberated in the primary lesions and disseminated in the blood stream. The reaction appears, therefore, to result from hypersensitivity to the fungus protein. Evidence in support of internal origin comes from the symmetrical distribution of rashes or eruptions [the "id" lesions] on the body surface and from the isolation of spores from the circulating blood.
>
> [Wolf & Wolf 1947]

Rubrics in Fungal Infections

• "Tinea in the North American climate is mainly an inconvenience or a cosmetic problem," writes Morrison. "Persistent or recurring cases of tinea require constitutional treatment. The condition has long been associated with the tubercular miasm, an idea that is reinforced by the fact that many cases of 'ringworm' have been cured by tubercular remedies such as

Tuberculinum and Bacillinum. Many of these superficial fungal infections are difficult to treat homeopathically." As the main rubric in fungal infections, he gives "Skin, Eruptions, Herpetic, circinate" [this being the older term for Tinea corporis], and as other important rubrics:

Head, Eruptions, Herpes, circinate.
Head, Hair, Falling out, Spots.
Face, Eruptions, Herpes, circinate.
Face, Eruptions, ringworm.
Abdomen, Eruptions, Herpes, ringworm.
Chest, Eruptions, Sternum, Herpes, circinate.
Extremities, Cracked skin, feet.
Extremities, Cracked skin, Toes, between.
Extremities, Eruptions, ringworm.
Extremities, Eruptions, Elbow, Herpes, ringworm.
Extremities, Eruptions, Forearm, Herpes, circinate, each arm.
Extremities, Eruptions, Hand, Palm, circinate.
Extremities, Eruptions, Thigh, Herpes, circinate, each thigh.
Extremities, Eruptions, Leg, circinate, inner side.
Extremities, Eruptions, Leg, Herpes, circinate, each leg.
Extremities, Nails, thick.
Skin, Eruptions, Herpetic, circinate, Spring, every.
[Roger Morrison, Desktop Companion to Physical Pathology; Nevada City, 1998]

To this may be added: Face, Eruptions, Beard, folliculitis [= barbers itch].

Constitutional state

• Modern medicine regards tinea as a superficial infection, with invasion of only dead tissues of the skin and without much, if any, constitutional effects. Some [pre] disposing factors have been implicated, such as hot climates, humidity, sharing of commodities, hyperhidrosis, obesity, poor hygiene, exposure to animals, and lack of ventilation, but these can hardly be considered constitutional.

In the 1880s, the English homeopathic physician James Compton Burnett arrived at entirely different conclusions. He found that ringworm most commonly occurs in patients with inherited tuberculosis and saw its appearance as a sign of approaching TB. Burnett used Bacillinum; a remedy that he introduced to homeopathy, in high potency, as a standard treatment and

observed excellent results from it. Of ringworm he held positively:

(1.) That it is a constitutional complaint.
(2.) That it is generated by the being together of numbers of young people in close spaces, i.e., by their personal emanations, or anthropotoxine.
(3.) That it is so to speak, "subtuberculosis."
(4.) That it is curable by its pathologic simillimum, here termed Bacillinum, in high potency, internally and infrequently administered.
(5.) That the mycosis is merely the concomitant external manifestation of the disease and not the disease itself.
(6.) That the external treatment of the disease is irrational, unscientific, and, probably, harmful to the patient.
(7.) That it is commonly bred in schools.
(8.) That truly healthy children cannot catch it because the fungus cannot grow upon such.
(9.) There is, therefore, no reason why a ringwormy child should be excluded from school life or the company of its fellows in home life.
(10.) And, finally, that the trichophyton of ringworm is to ringworm what the bacillus of Koch is to tuberculosis, - the trichophyton and the bacillus being, moreover, nearly related to one another.

[James Compton Burnett, *Ringworm: its Constitutional Nature and Cure;* 1888]

Cats and dogs

• Dermatophytes can be cultured from cats, and to a lesser degree dogs, without lesions, particularly in multi-animal households, shelters, etc. Cats, whether subclinically infected or transient vectors, may be for people a source of infection with Trichophyton mentagrophytes [or Microsporum canis], resulting in tinea capitis or tinea corporis.

Can it be so that this correlates with the ambivalent feelings of tuberculinic remedies towards cats and dogs? Curiosity, with its firm grip on tuberculinic types, kills cats, despite their proverbial nine lives, but so does worry. Better to first see which way the cat jumps. The repertory has:

Fear of cats: Bacillinum, Tuberculinum, and some others.
Fear of dogs: Bacillinum, Tuberculinum, and many others.
Love for cats: Tuberculinum, and a few others.

Exclusion

• According to Christensen, in the times of the Tudor rulers of Great Britain "some of the courtiers and hangers-on were given official permission to remain covered in the royal presence because they had ringworm of the scalp and looked less repugnant with their heads covered than they did with bare heads."

In later times "ringwormy" children were "excluded from school life or the company of their fellows in home life." A warning concerning ringworm issued by the Department of Education in St. Paul, Minnesota, in 1945, stated, "an infectious scalp disease is spreading among school children in many American cities." In order to reduce the spread of the disease infected children "should not be allowed to attend movies, Sunday School, church or any public gathering, and must not mingle with other children." In a French city in the early years of the 20th century, it was customary to take children with tinea capitis out of regular school and put them in a separate one of their own.

So were lepers at one time, being forbidden all normal social contacts. As "targets of shocking rites of exclusion, they were segregated in special houses outside towns, lazarettos, following the injunction in Leviticus that the 'unclean' should dwell beyond the camp. There was also a leper mass, conducted with the victim in attendance, declaring the sufferer to be 'dead among the living', and the 1179 Lateran Council ordered them cast out from society, with their own burial places." [Porter, 1999]

The indignities to which lepers were subjected were "a necessary part of the eradication of leprosy from Western civilization, and a calculated cruelty that was effectively beneficial for the country," as one author professed.

Porter, on the other hand, argues that the decline of leprosy in the 14ó11 century "might be connected with the rise of tuberculosis, which has a similar but more aggressive pathogen; the TB bacillus could have elbowed out the leprosy." Yet, the menace of leprosy remained, "becoming a paradigm for later diseases of exclusion, and for persecution generally. Leprosaria were used for the poor and those suspected of carrying infectious diseases."

Modern medical textbooks commend that children infected with tinea "should be excluded from schools and swimming pools until at least 24 hours following the commencement of appropriate treatment." Individuals with chronic or subclinical infections "represent a public health risk to the general population."

Griseofulvin, an antifungal made from the mould Penicillium griseofulvum, was once the drug of choice and seemed to help in stemming the rising tide of fungus infection. It is now less commonly used due to the pinning of hopes on more effective and less toxic fungus-killers.

• Some of the dreams narrated by Sankaran's *Ringworm* provers seem to bring out the theme of exclusion. For example [my italics]:

> I am at my friend's house and all the family members are present; actually he has one brother but in the dream he has also a sister. *When I reach there everybody leaves the house* and only he stays. Then suddenly someone comes and takes the brother by the hand. They go to the bathroom and I follow them, the new comer is having a knife in his hand and he covers the brother's face with a mask, I feel it is anaesthesia. He is about to kill him, they close the door and I hear him screaming. I turn around and his sister is there again, the new comer takes her somewhere and she cries for help. Then all the members of the family come back, the sister is being raped *but they are cool about it.*
>
> One person becomes naked on a road and shows his varicose veins to me. He is not embarrassed. *Other people on the road walk as if they are not aware of us.* [Not looking at us.]
>
> • I go to an office but *people don't allow me to enter and drive*

Keratinophilic filamentous moulds. Dermatophytes on man and animals. Rare examples of fungi that are highly contagious. Confined to outer skin layers; rarely invade living tissues. Causative agents of tinea [ringworm]. Exclusion from social contacts. (Leprosy miasm). Tuberculinic miasm.

Skin

• Being excluded or self-imposed exclusion ["hiding one's deformities"] seems an obvious result of fungal infections "in which the skin is affected in a particularly repulsive way" or which produce "monstrously enlarged feet or legs," as in Maduromycosis, so that "visitors to the tropics are sometimes appalled by the sight of it." Reactions of avoidance and/or hostility, perceived or actual, are of course not limited to fungal skin lesions, but generally associated with "unsightly" skin conditions, since the skin is our prime contact organ.

• Claiming that in illness we live our true and complete Jungian analyst Alfred Ziegler unfolds an intriguing perspective on the archetypal roots of skin disease.

Itching is the somatic form of a number of erotic, hostile, even spiritual affects occurring particularly when we imagine that we have such affects under control and especially at times when this illusion of control is interrupted by a sudden and unexpected state of isolation. This holds true for numerous pruriginous skin conditions accompanied to a greater or lesser degree by physical symptoms.

This seems to be the case for psoriasis, which tends to pop up in moments when a prudish attitude of non-involvement is confronted in unusual ways by gregarious drives. It is also the case for allergic eczema whose pointed, itching, dermal granulations manifest themselves at times when a state of "anergy," an absence of emotional reaction, is contrasted by pronounced impulses for revenge or self-preservation. Children as well as adults are affected by these conditions.

Milk allergy, an evolutionary precursor of eczema, is a child's way of defending itself against an overly 'ascetic' mother and the threat of isolation. Allergic nettle rash, *urticaria,* whose onset can be characterized by a pronounced itching, is a similar condition. It especially tends to occur when we are mired, more or less consciously, in fruidess, ad absurdum complaints against man and nature, when the repressed desire to strike back with 'inflammatory' comments is pathologized and appears as an itching'inflammation.' ...

A continual process of somatization takes place just below the surface of our consciousness, taking on forms that at first are not readily recognizable for what they are. This holds true for itching, *pruritus,* where the degree of acuteness seems to be directly correlated with the extent to which a kind of isolation capacity interrupts openness to one's environment. It is just this capacity for isolation which modern civilization depends on: the more industrialized a society is, the more certainly the isolation capacity is functioning.

Today this capacity has assumed more subtle forms that we designate as hygiene and cosmetics, both of which, without our really being aware of it, have taken on something of the nature of religious cults.

As was the case with earlier rituals, those surrounding our dealings with the skin are becoming more and more differentiated. Daily libations of soap and water have long given way to more complex ceremonies: salves are daubed on from a cornucopic palette of chemical substances, facial masks are plastered on indiscriminately, morning and evening the skin is 'nourished' and kept 'moist.'

The assertion has been made that these chemical substances are responsible

for an overwhelming increase in the incidence of skin disorders. If dermatoses have, in point of fact, assumed epidemic proportions, the causes are not nearly as certain as is sometimes maintained. It would seem, rather, that chemical substances merely serve as a vehicle, as the means to an end, whereby repressed, socially irreconcilable emotionality attempts to break out of an imposed isolation. It would seem that the increase in dermatoses lives more from a collective compulsion toward isolation and loneliness and less from contact with heretofore unknown, artificial substances.

[Alfred J. Ziegler, *Archetypal Medicine*, Spring Publications, Inc., Dallas, 1985]

FAVUS

• Favus or tinea favosa, a form of ringworm characterised by heavy, yellowish cup-shaped crusts [called scutula] and hair invaded throughout its length by hyphae, is produced by Trichophyton [syn. Achorion] schoenleinii. [Named after Professor Johannes Lukes Schonlein of Berlin, who, in 1839, had noted the 'vegetable' nature of favus.] Removal of the crusts reveals an oozing, moist, red base. After a period of years, atrophy of the skin occurs leaving a cicatricial alopecia and scarring. It is a disease of rural areas where poor hygiene and malnutrition are frequent. Colonies are waxy, highly convoluted and heaped, off-white to cream.

Favus, Honeycomb Ringworm, Tinea Favosa or Maligna, Porrigo Favosa or Lupinosa, is a vegetable parasite, the Achorion schoenleinii. "It used to be classed among the pustular eruptions, because it first appears as a small yellow spot, the sheath of the hair being filled with the fungus growth; but it has no tendency to suppurate. It grows with great rapidity, and forms large, hard, dry crusts, which have a peculiar mouse like odour. It is most liable to be confounded with impetigo, but it requires only moderate care to determine whether the crust be *hardened pus* or an *independent growth.* The distinction is based upon the presence or absence of secretion; be the crust of impetigo ever so dry, some trace of purulent secretion is sure to be met with; and if removed by a poultice, the moist, exuding surface cannot be mistaken. Knowing this fact we have no need to particularize the rounded form, the cracked, broken- looking surface, and all the other characters resembling honeycomb, which the older writers were obliged to enumerate." [Barcley]

The scalp is its most usual place of development, but it is sometimes found upon the nape of the neck, or in front of the ear, and even upon the arms.

"The pathology of favus is best understood by considering it essentially to be a form of abnormal nutrition, with exudation of a matter analogous to, if not identical with, that of tubercle, which constitutes a soil for the germination of cryptogamic plants, the presence of which is the pathognomic of the disease. Hence is explained the frequency of its occurrence in scrofulous persons, among cachectic or ill-fed children, and the impossibility of incubating the disease in healthy tissues, or the necessity of there being scaly, pustular or vesicular eruptions on the integuments previous to contagion." [Bennet, Lilienthal's *Skin Diseases.]* This view is borne out by actual clinical experience. [Raue 1896]

TRICHOPHYTON DEPRESSUM **Trichoph-d.**

Scientific name Trichophyton mentagrophytes (Robin) Blanchard 1896. **Synonym** Trichophyton depressum MacCarthy 1925.
Family Arthrodermataceae.

KEYS

- Anthropophilic and zoophilic mould.
- Cats, and to a lesser degree dogs, may be for people a source of infection with this organism.
- Moderate growth rate.
- Tinea capitis, corporis, cruris, barbae, pedis.
- Perforates hair.
- Abscesses accompanied by regional glandular swellings and fever.

FEATURES

- Anthropophilic and zoophilic [rodents, rabbit, horses, dogs, and particularly cats].
- Worldwide distribution.
- Affects feet, body, nails, beard, scalp, hand, groin.
- Growth rate: moderate.
- Optimum growth at 37° C.
- Colonies granular, velvety or downy, white to sandy to butter yellow, or pale yellow to tan.
- Perforates hair.
- Contagious.

KERION

- This species may produce inflamed fungal abscesses [Celsus' kerion], presenting as scattered, painful, pruritic, pustular folliculitis associated with regional glandular swellings and even fever. It manifests in about 2-3% of the cases as a boggy mass studded with broken hairs and purulent sticky material, often with satellite spots. It is often confused with a large boil or carbuncle. Alopecia and permanent scarring are common.

TRICHOPHYTON PERSEARUM

Trichoph-p.

Scientific name	Trichophyton persicolor Sabouraud 1910.
Synonyms	Microsporum persicolor (Sabour.) Guiart & Grigoraki 1928.
	Trichophyton persearum.
Family	Arthrodermataceae.

FEATURES

- Zoophilic mould [vole, mice]; not found in soil.
- Invades skin, not hair.
- Colonies downy to powdery; yellow to peach or pale pink.
- Growth rate: rapid.
- Sporadic in Europe.

TRICHOPHYTON RUBRUM **Trichoph-r.**

Scientific name Trichophyton rubrum (Castellani) Sabouraud 1911. **Synonyms** Epidermophyton rubrum Castellani 1910.
Trichophyton purpureum (Sabour.) H. Bang 1910.
Sabouraudites ruber (Cazalbou) Nann. 1934.
Family Arthrodermataceae.

FEATURES

- Anthropophilic mould; rarely isolated from animals; not found in soil.
- Most common cause worldwide of ringworm of the feet, body, groin, rarely scalp.
- It may also produce a form of tinea pedis [athlete's foot] with white hyperkeratosis and a strong odour.
- Colonies flat, downy, or granular to cottony, white to cream or pale pink.
- Growth rate: slow to moderately rapid.
- Contagious.
- "The granular strain is a frequent cause of tinea corporis in South East Asia and in Aborigines living in the Northern Territory of Australia. However, since the Vietnam War, it has been spread throughout the world, especially to those countries with returning troops or to those receiving refugees, where it has often been described as a new species.
The granular strain represents the parent strain of the downy type; the later evolved by establishing a niche in feet [tinea pedis] when the former was imported into Europe around the turn of the century. It should be stressed that intermediate strains between the two types do occur and that many culture and morphological characteristics overlap." [website DoctorFungus]

TRICHOPHYTON TONSURANS **Trichoph-t.**

Scientific name	Trichophyton tonsurans Malmsten 1848.	
Synonym	Trichophyton sulphureum Sabour. & Fox	1909.
Family	Arthrodermataceae.	

NOTE: Misspelled in repertory as Trychophyton tonsurans.

FEATURES

- Anthropophilic mould.
- Worldwide distribution but considered endemic to the United States, Canada, Mexico, the Caribbean area, and northern South America. [Fisher]
- Invades scalp, body "shower sites," occasionally nails.
- Penetrates hair.
- Highly contagious.
- Common cause of epidemic tinea capitis; responsible for more than 90% of cases in North America and the United Kingdom. Four signs are typically associated with tinea capitis:
    - [a] scaling of the scalp;
    - [b] scalp pruritus;
    - [c] diffuse, patchy or discrete alopecia;
    - [d] adenopathy of the occipital or posterior auricular lymphatic chains.
- Colonies granular to suede like, often with abundant mycelium in the medium, folded, bright yellow, tan, or purplish-red.
- Growth rate: slow.
- Growth enhanced by thiamine [vitamin Bl],
- Produces urease.
- Causes kerion, an inflammatory infection of the scalp and beard. [See T. mentagrophytes].

RINGWORM Ringw.

KEYS

- Miasm between Psora and Sycosis.
- Periods of hope - trying to do something - alternating with periods of giving up.
- Consolation <.
- Aversion to coffee.

MIASM

• "It took Hahnemann several years to understand the theory of the miasms and he wrote brilliantly on Psora but relatively very little on Syphilis and Sycosis and nothing at all on the Tubercular taint - the combination of Syphilis and Psora," writes Phyllis Speight in the introduction to *A Comparison of the Chronic Miasms.* The term miasm refers to a "disordered state of the internal economy," states J.H. Allen in *The Chronic Miasms.* This internal deranged state was originally classified into Psora, Sycosis, and Syphilis, a triad to which Allen adds Pseudo-Psora, as he calls the Tubercular state. Although Hahnemann had included many of its features under Syphilis, its basic concept is now thought to include "degenerative and slow healing processes" as well as fibrosis and an intense allergic or idiosyncratic state. Sankaran finds the idea of miasms "a most useful tool to classify disease states," representing "the different possible types of reaction, which naturally mean the different types of perception of reality." To make the process more accurate, he worked "on other miasms in between the main miasms." He writes: "As for the miasm between Psora and Sycosis, I had great difficulty in finding one that had the characteristics of Psora, i.e. the struggle with anxiety about success, and Sycosis, with its fixity and given up state with no hope of recovery [yet not life threatening], I was searching for an infection that comes up suddenly with an intense struggle that is not life threatening but at other times is quiet and fixed. After much thinking and reading, I got the idea that this infection was none other than *Ringworm. Ringworm is characterised by periods when it is just another skin lesion and times when it itches terribly like scabies, compelling scratching - thus there are both the resigned acceptance as well as the element of struggle."* [The Substance of Homoeopathy, p. 57]

PROVING

• To verify the correctness of the hypothesis of the Ringworm miasm as an intermediate state between Psora and Sycosis, Sankaran did a proving with the Ringworm nosode. The nosode was prepared from "a specimen of ringworm scraped from the skin of an infected patient" and on two occasions proved in 30c on volunteers. During the first trial, "the provers took the 30c potency every night until symptoms developed up to 8 days in some instances. None of them knew what they had taken. Seven of the provers developed symptoms." The second trial was conducted at a 1993 seminar in Bombay.

DREAMS

• To reveal the inner essence of the Ringworm proving Sankaran relied mainly on the dreams.

Prover 1 had a dream that he was the boss of a hospital, the king.

Prover 2 had a dream in which he was anxious that he had not taken enough notes from the Organon and had difficulty trying to pass an exam. Prover 2 is normally anxious. After taking the remedy his anxiety went down. This was a case of cure from the remedy. "Normally I have to rush for my bus. I get very tense trying to reach the college in time. That tension disappeared after the remedy. I thought 'Fine, I can miss my lecture. I could relax.' Anxiety usually led to irritability. "My anger has come down a lot. I used to tremble with anger." He used to tear and break things when they didn't work for him. "I had a dream that I was trying to tell my friends to give up smoking. I was trying to force the matter. 'Don't smoke' I said."

"I also had a dream I was playing cricket and doing well. Usually I am sluggish, I can't move in life. I was very strong in the field. I won the match for my team. In the morning I had a pain in my neck on the right side. It started gradually. I tried stretching but it didn't help. I was sleeping or lying with hot applications. In the evening it came back. Sometimes I had a pain in my hand as well as the neck."

Prover 3 dreamt he developed varicose veins, a calcaneal spur and pain in the left eye. He went to the hospital for treatment and was offered a homeopathic mixture. He wanted a single remedy. They told him he would have to wait 15 days in the hospital. "Cut off my leg then" he said.

Some provers developed an aversion to coffee. Three of the provers dreamt

of pain in the left eye with inflammation.

Prover 4 had a dream that all the provers had forgotten to take the first dose. At college they were all told they would dream the same thing. They all felt strange and foolish. He had a dream of having a pinch of salt in his hand. He had a biting pain in the stomach from 4 - 5.30 pm. On the second day at 2 pm he had to press his stomach to ameliorate the pain. He had a yellowish/greenish discharge from the left eye. He felt tremendous anxiety in the chest for 5-10 minutes, as if the heart had reduced in size. A fear that something was going to happen, which lasted the whole day. He also had sudden attacks of anxiety.

Prover 5 had a dream that a nephew and cousin were urinating in the bathroom together. The stream of urine was hitting the wall. It was a childish game but it was no use telling them not to do it. "They always do it. It doesn't work to tell them."

Prover 6 had a dream he was in an old school doing a fashion show. They were all dancing on the stage and the show was good. Then he walked along a corridor and saw his friends sitting in a room doing an exam. He was hiding from the lecturer who walked by. Another dream of a field of crops and a huge ship. His whole life's survival depended on cutting the crop and making a ship to take the crop. Then he has a big party and in front of him the whole ship is destroyed. This dream didn't tally with the rest of the provers. The dream was about success and failure and no struggle. In the other dreams you see no panic and no destruction. They were about inertia and struggle. The prover was asked what he felt the dream meant. "It explains my life situation," he said. He was the only prover who had received placebo and at that time I didn't know this.

Prover 7 felt tremendous anxiety. He had a dream that ten patients came at 6.30 all in an acute state and all wanting medicine straight away. He told them to come one at a time. He was told to learn patience. The solution, a doctor tells him is to learn patience and not to panic. She, the doctor, sees five of the patients and he sees the other five.

Prover 8 felt he was losing his balance in the last few days while riding a bike.

[Sankaran, The Substance of Homoeopathy]

• The second proving brought out "a lot of dreams of parties, feasts. The theme seems to be: dreams of danger; of being pursued; of being sad. Aggravation from consolation. Of somebody facing a danger and the dreamer being unable to help."

THEMES

• Aggravation from consolation, aversion to coffee and pain in the left eye with inflammation are symptoms that can be extracted from the provings. Sankaran summarizes the proving effects thus:

> The main theme of the dreams was a feeling of 'trying to do something. On one hand, there were periods of trying to do something with a feeling of hope while at other times there was resignation and acceptance of the situation, followed again by another trial. This alternation between struggle and giving up was seen in the dreams of most provers of this nosode.
>
> For e.g. one person had a dream that he was inside a little tent and was trying to come out of this tent, but outside the tent were thousands of crows that pecked him when he got out, so that he had to get back again. He would try again but the same process would recur. Similarly other provers had dreams that represented a situation in their life where they were trying to do something - sometimes with hope, sometimes giving up altogether.
>
> No doubt further provings are needed to understand this nosode better but the initial pilot testing seems to confirm my idea that the Ringworm miasm has the main feeling of "Trying." The situation is on the borderline of his capacity and, while not threatening, it is good for him to succeed. So he tries periodically but when he fails, he just gives up and accepts it. This reminds me of the Struggle of obese people trying to lose weight. There are periods of struggling, jogging, walking, dieting followed by periods of acceptance, chocolates and calories.
>
> [Sankaran, The Substance of Homoeopathy]

Ringworm Miasm: Miasm between Psora and Sycosis. Trying Periods of hope trying to do something alternating with period of giving up. Ringworm Remedy: Consolation < Aversion to coffee. Pain in left eye. Lack confidence, H/o fungal infection. Rxs: Calc-s. Mag-s. Calc-sil.

• Clinical experience with *Ringworm* has rendered the drug picture somewhat more substantial.

> I have understood the main feeling of this nosode to be that the task at hand is just beyond where the person can be sure of success. The main action of the prover or the patient is therefore trying to do something, trying to accomplish a task. He starts with a kind of lack of confidence, becomes hopeful, tries to accomplish the task and struggles at it. At some point,

however, he decides that it is not going to work, that he will not be able to accomplish the task by this method; that it is beyond his reach. So he gives it up, and accepts that he has to live with it. As a result he doesn't do anything for quite some time. After a while, however, another possibility seems to open up for him and he becomes hopeful once again. He starts trying and struggling all over again, only to give it up after realizing that it is beyond him. So there is an alternation between struggling and trying, and then giving up, between hopefulness and resignation. I have found that in the dreams of most of the provers as well as in the lives of most of the patients, one can see an alternation of this struggle with periods of inertia, whether it is trying to reach college on time, trying to give up smoking, trying to get rid of his illness or trying to build a relationship.

I have seen that these patients generally lack confidence. There can be egoistic talk like in *Sulphur* or, on the other hand, a cover up like in *Medorrhinum.* There can be anxiety attacks as well. But the pathology and symptoms all come and go in phases. There is often a history of fungal infection, either in the groins, or in between the toes, with periods of terrible, intolerable itching, alternating with periods of no itching whatsoever. The symptoms never really become acute or destructive, and the person feels that he will have to live with the problem, although it would be better to try and get rid of it. He struggles periodically but when he fails, he just accepts it.

The remedies that come closest are *Calcarea sulphurica, Magnesium sulphuricum,* and *Calcarea silicata.*

[Sankaran, The Soul of Remedies]

II B. FAMILY ONYGENACEAE

Blastomyces dermatitidis
Coccidioides immites
Geomyces pannorum [hom.: Aleurisma lugdunense]
Histoplasma capsulatum
Paracoccidioides brasiliensis

BLASTOMYCES DERMATITIDIS **Blast-d.**

Scientific name Blastomyces dermatitides Gilchrist & W.R. Stokes 1898.
Synonyms Scopulariopsis americana M. Ota 1928.
Zymonema dermatitidis (Gilchrist & W.R. Stokes) C.W. Dodge 1936 [considered nomen dubium].
Teleomorph Ajellomyces dermatitidis McDonough & A.L. Lewis 1968.
Family Onygenaceae.

KEYS

- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Moist environments.
- Dogs.
- Causative agent of blastomycosis.
- Predilection for the lungs and the skin and subcutaneous tissue.

FEATURES

- Dimorphic fungus comprising a slow growing mould form that converts to a yeast-like form in mammalian host tissue at 37° C.
- Rarely isolated in culture from soil or other natural substrates, but has been associated with beaver huts.
- According to Fisher, the fungus has also been found in moist environments in wood, tree bark, rotting vegetation, manure, and wet acid soil from the banks of rivers.

BLASTOMYCOSIS

• Blastomycosis is widely referred to as North American blastomycosis or as Gilchrist's disease because the dermatologist T.C. Gilchrist recorded in 1896 the disease in the United States as "blastomycetic dermatitis."
• "Most reported cases are from the USA, chiefly in the south-eastern states and the Mississippi River valley, and in men aged 20 to 40. A sufficient number of cases from widely scattered sites in Africa now preclude geographic limitation of the disease name. ... Disease occurs prominently in dogs and may be a harbinger of that in humans; it has been reported to follow dog bites. The disease is rare in patients with AIDS." [Merck Manual]

CLINICAL FORMS

Two clinical forms are distinguished.

- Primary pulmonary blastomycosis.
- Disseminated blastomycosis.

• A dry hacking or productive cough [with purulent and blood-streaked sputum], hoarseness, chest pain, low-grade fever, chills, drenching sweats, and dyspnoea are the initial symptoms of the *pulmonary form.* The respiratory form is similar to tuberculosis, coccidioidomycosis, paracoccidioidomycosis, and histoplasmosis.

• The *disseminated form* may spread haematogenously to the prostate, epididymis, testis, bone, and, typically, to the skin and subcutaneous tissue. The gastrointestinal tract is rarely involved.
The vertebrae, ribs, tibia, and femur are more commonly involved than other bones; swelling, heat, and tenderness are present over the lesion. Destruction of bone tissue is not uncommon.
Skin lesions frequently involve the exposed parts of the face and neck, where warty, thickened patches with small suppurating central abscesses develop, which spread widely and cause extensive scarring and destruction of tissue.

> Cutaneous blastomycosis may originate as a subcutaneous nodule or be observed first as a papule or as a pustule that ulcerates. ... The cutaneous

lesion develops within weeks or months into an ulcerated or verrucous granuloma with a serpiginous, advancing border elevated 1 to 3 mm and with an abruptly sloping outer border. The central area of the lesion may be verrucous or ulcerated and covered with crusts. In either case the base of the lesion is granulomatous and contains numerous small abscesses. The elevated border of the lesion is indurated, dusky red or violaceous and it, also, contains numerous minute abscesses. Characteristic budding cells of *B. dermatitides* can be demonstrated in pus from these abscesses.

Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
Moist environments.
Dogs.
Causative agent of blastomycosis.
Predilection for the lungs and the skin and subcutaneous tissue.

Lesions spread slowly, and the advancing margin may, in a period of months or years, extend over the face, often deforming the features and leaving a thin atrophic scar over the central area of the old lesion.

Cutaneous lesions associated with underlying bone lesions are characterized by persistent discharging sinus tracts. They may not produce the verrucous advancing margin usually seen in cutaneous blastomycosis.

[Emmons 1977]

COCCIDIOIDES IMMITES **Cocci-im.**

Scientific name Coccidioides immites G.W. Stiles 1896.
Family Onygenaceae.

KEYS

- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Dry, saline soils. Desert areas.
- Highly resistant to heat, dryness, and salinity.
- Becomes airborne in dust storms.
- Desert rheumatism: combination of arthritis, conjunctivitis, and erythema nodosum.
- Causative agent of coccidioidomycosis.
- Higher incidence in males and among dark-skinned people.
- Predilection for the lungs, musculoskeletal system, and the skin.
- Defining disease for AIDS.

FEATURES

- Dimorphic fungus living as a saprophytic mould in soil and as a pathogenic yeast-like organism in humans and animals forming large spherical structures with thick walls. These spherules contain infectious endospores.
- Mould colonies, cultured at 25° C, are initially moist and glabrous, but rapidly become suede-like to downy and greyish white in colour.
- Found in dry, saline soil where winters are mild and summers are hot; endemic in desert areas of the south-western U.S. and of Central- and South American countries.

> Egeberg has reported that the fungus disappears from the desert floor during the hot summer, that it persists in rodent burrows where it is protected from intense solar heat and radiation, and that it spreads again over the desert floor after winter and spring rains. He demonstrated that *C. immites* is able to survive higher temperatures and to grow in higher salt concentrations that some of its normal antimicrobial antagonists in soil. It is more abundant in soil after a rainy season of small showers, which produce a capillary movement of salts toward the soil surface, than after a rainy season of heavy rains which wash some of the salts out of the upper layers of soil.

• The infectious conidia become airborne in dust storms. After the major dust storm of 1977 from the San Joaquin Valley up into northern California numerous cases of coccidioidomycosis were reported in non-endemic regions of middle and northern California where the dust and soil had settled.
• Desert rodents have been shown to be vectors.
• This organism is on the U.S. Government Occupational Safety and Health Administration [OSHA] list of biological agents and toxins that have the potential to pose a severe threat to public health and safety and that can potentially be utilized by terrorists.

COCCIDIOIDOMYCOSIS

• Known as Valley Fever since the organism is prevalent in the San Joaquin Valley of Central California and in Mexico [but absent from the deserts of Africa and Asia].
• The process of infection, progress of the disease, and clinical symptoms, are very similar to those of histoplasmosis.
• Most cases are benign and self-limiting, whilst the disseminated form of Coccidioidomycosis has a four times higher incidence in males than in females [although infection is likely to be more severe during pregnancy], and among dark-skinned people [especially African Americans and Filipinos]. Primary coccidioidomycosis with erythema nodosum, on the other hand, is more common in women than in men.
• The disseminated form is a defining disease for AIDS.
• Infection is an occupational hazard for construction workers, farmers and those exposed to soil and dust.
• Determined primarily on the basis of skin tests an estimated 25,000 to 100,000 new cases occur each year in the United States.
• Coccidioidomycosis occasionally presents as *desert rheumatism,* a form with arthritis, erythema nodosum, and conjunctivitis.

> The arthroconidia of Coccidioides immites are very resistant to heat, dryness, and salinity. They reside in the soil; 10 to 14 days after breathing contaminated dust, 60% of patients with coccidioidomycosis exhibit an asymptomatic respiratory infection. The remaining 40% present symptoms of mild or, rarely, severe flu-like respiratory illness [primary pulmonary coccidioidomycosis] . The patient recovers or, if the immune response is compromised, may succumb to gradual or rapid disseminated disease. In

endemic areas, 3% of the normal population converts to a positive *Coccidioides* skin test every year.

However, over 20% of AIDS patients develop clinically apparent coccidioidal infection every year. Pulmonary complications such as cavity formation or persistent pneumonia occur in 5% of adults, especially those with pre-existing lung disease or diabetes mellitus. Organisms may spread haematogenously from the lungs to the bones, joints, skin, subcutaneous tissues, internal organs, brain, and lymph nodes. The skin, musculoskeletal system, and central nervous system are the most common sites of invasion.

[Kern 1997]

CLINICAL FORMS

• *Primary Pulmonary Coccidioidomycosis.*

Incubation period between 7 and 28 days. ... Most patients are febrile for periods varying from a few hours to months, and eventual dissemination is more probable as fever continues, particularly if it varies gready in intensity [to 40.5° C] or recurs after a remission. Fever often exhibits diurnal variation and is associated with night sweats.

Pleuritic pains are frequent and may be so sudden in onset and so severe as to simulate traumatic fracture of a rib, myocardial infarction or acute pericarditis or cholecystitis. The pain associated with respiration may be accompanied by substernal pain or pressure and when the latter is so severe as to interfere with swallowing, it is believed to be due to mediastinal lymphadenitis.

Cough is associated with moderate to severe pulmonary involvement and may be productive of white, purulent or blood-streaked sputum. In milder cases cough may be unproductive; there may be no cough even in the presence of a surprising amount of pulmonary disease.

Anorexia of brief duration is a common complaint in even mild cases. The patient may lose 20 to 30 pounds within a period of 2 to 3 weeks.

Generalized aches, backache, myalgia, malaise and fatigue may be prominent, without obvious pulmonary involvement. Lassitude may persist for weeks without dissemination. Headache may be severe.

Cutaneous lesions are present in a small percentage of cases of primary coccidioidomycosis. An early generalized, macular, erythematous rash appears in perhaps 10% of cases.

Erythema nodosum and erythema multiforme, although they also occur in tuberculosis and other diseases, are considered within endemic areas to be pathognomonic of primary coccidioidomycosis. Indeed, before the frequency and variety of mild forms of the mycosis were known, these erythematous manifestations of host reaction were regarded as essential features of San Joaquin Valley fever. Erythema and associated joint pains were, in fact, responsible for the designations given by laymen, 'desert rheumatism' and 'the bumps.' ...

The lesions of erythema nodosum are usually located on the anterior tibial areas, sometimes more numerous near the knees and occasionally extending to the thighs. They appear as crops of bright red, raised nodules a few millimetres to several centimetres in diameter. They arise deep in the skin as firm or elastic areas of induration and inflammation that are pruritic, tender or painful. They become purplish, then brown and regress, usually in 1 to 2 weeks.

Erythematous lesions seen above the thighs usually assume the aspect of erythema multiforme. The lesions may be nodules, macules, papules or vesicles with circinate or irregular and raised borders. They usually appear in one crop and regress, but successive crops sometimes occur. They are located characteristically on the exposed areas of the upper chest, shoulders and upper arms.

In the patient with erythema nodosum there may be associated conjunctivitis and pharyngitis.

[Emmons 1977]

Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
Dry, saline soils. Deser areas.
Highly resistant to hea dryness, and salinity.
Becomes airborne in d storms.
Desert rheumatism: combination of arthriti conjunctivitis, and erythema nodosum.
Causative agent of coc cidioidomycosis.
Higher incidence in males and among dark skinned people.
Predilection for the lungs, musculoskeletal system, and the skin.
Defining disease for AIDS.

• *Benign Residual Coccidioidomycosis.*

Chronic pulmonary cavitation is the most frequent complication of primary coccidioidomycosis and is estimated to occur in 2 to 8% of symptomatic infections. It may be almost symptomless ... and the cavity may persist for many years without dissemination of disease especially in Caucasians.

Coccidioidoma is a benign residual lesion usually representing an arrested or healed pneumonitis or granuloma. The term 'coccidioidoma parallels 'tuberculoma.' ... Coccidioidomas usually remain stable but may excavate [sometimes in association with secondary bacterial infection] and later refill. They usually contain some calcium. They usually are asymptomatic,

are discovered by accident, usually do not represent a hazard of probable reactivation and become medical problems because they lack pathognomonic characteristics and therefore are difficult to differentiate from carcinoma. [Emmons 1977]

• *Disseminated Coccidioidomycosis.*

Lesions generally are widespread, commonly involving the lymph nodes, spleen, skin and subcutaneous tissue, liver, kidney, bone, joints and meninges. For some unknown reason, the gastrointestinal tract, in contrast to paracoccidioidomycosis, tuberculosis and histoplasmosis, shows relative immunity.

Latin name

GEOMYCES PANNORUM

Aleur-1.

Synonyms

Geomyces pannorum (Link) Sigler & J.W. Carmich. 1976.
Sporotrichum carnis F.T Brooks & Hansf. 1923.
Sporotrichum lipsiense Benedek 1926.
Aleurisma carnis (F.T. Brooks & Hansf.) Bisby 1945.
Rhinocladium lipsiense (Benedek) Brumpt 1949.
Sporotrichum cejpii Fassat. 1953.
Chrysosporium pannorum (Link) S. Hughes 1958.
Chrysosporium verrucosum Tubaki 1961.

Family

Onygenaceae.

Homeopath

Aleurisma lugdunense [syn. Aleurisma carnis].

KEYS

- Cold-loving saprophytic mould.
- Acid environments.
- Rapid growth rate; expanding.
- Variable.
- Degrades keratin; associated with superficial skin and nail infections.

FEATURES

- Psychrophilic [cold-loving] fungus found ubiquitously in temperate to Antarctic soils throughout the world.
- Saprophytic, expanding, growing rapidly.
- Unlike its dimorphic family members - Blastomyces, Coccidioides, Histoplasma, Paracoccidioides - Geomyces pannorum cannot be converted to a yeast phase at 37° C.
- Frequently isolated from soils, airborne dust, and waste water associated with mammalian and/or avian activity.
- Predominant micro-organism associated with the degradation of soil- buried polyester polyurethane in landfill.
- Optimal growth temperatures range between 18-20° C, yet can be cultured at temperatures as low as -5° C.
- Grows optimally in acid environments [pH 3-4].
- Tolerant of both salty conditions [halotolerant] and extreme dryness [xero- tolerant].

- Notable for its extremely variable colonial morphology, frequently displaying different colours and/or textures between successive transfers or in different sectors of the same colony.
- Surface colours range between white, yellow, olive, brown, pink, or even lilac.
- Produces biochemicals now introduced as novel antifungal agents: Chryscandin and Pannorin.

[Data: www.fungalgenomics.concordia.ca/fungi]

SKIN INFECTIONS

- Thought to be a transient inhabitant of the human skin, especially the feet.
- Breaks down keratin.
- Occasionally isolated as the causal agent of superficial skin and nail infections in humans.

Cold-loving
saprophytic mould.
Acid environments.
Rapid growth rate; expanding.
Variable.
Degrades keratin;
associated with
superficial skin and nail infec
tions.

Scientific name	Histoplasma capsulatum Darling 1906.
Synonyms	Torulopsis capsulata (Darling) EP. Almeida 1933. ~~Histoplasma pyriforme (M. Moore) C.W Dodge 1935.~~
Teleomorph	Ajellomyces capsulatus (Kwon-Chung) McGinnis & Katz 1979.
Family	Onygenaceae.

HISTOPLASMA CAPSULATUM

Histo-c.

KEYS

- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Slow growth rate.
- Causative agent of histoplasmosis.
- Defining disease for AIDS.
- Histoplasmosis may coexist with sarcoidosis or tuberculosis.
- Endemic in eastern and central North America.
- Chickens, starlings, and bats.

FEATURES

- Dimorphic fungus exhibiting a mould form in soil and a yeast form in animals and humans.

The mould [mycelial or filamentous] form grows at an optimum temperature of 25° C, while the yeast form thrives at 35-37° C.

- The mould form is saprophytic, the yeast pathogenic.
- Mould colonies are slow growing, granular to cottony in appearance, white initially and buff brown with age.
- Yeast colonies are slow growing, creamy and moist.
- Worldwide distribution, but endemic in eastern and central North America, where 80% of the population show hypersensitivity to this organism.
- Occurring in soil with high nitrogen-content [e.g. around chicken coops and under starling roosts], in caves harbouring bats, in attics of older houses sheltering the common brown bat, and in decaying trees.

BATS and STARLINGS

• Unlike birds, whose body temperature of 41-42° C is too high for the fungus to survive, bats can become infected with H. capsulatum and thus may excrete the organism in their faeces. H. capsulatum has been isolated from bat guano collected from around the world, and by 1970, 25 bat species had been reported to harbour this organism.

> The associations of histoplasmosis with bats and starlings attracted much interest. In 1948, Washburn, Tuohy and Davis described a pulmonary disorder they called 'cave sickness' in persons who had visited certain bat-infested caves and from soil from the mouth of one cave, an isolation of *H. capsulatum* was made. This epidemic was accepted by Grayston & Furcolow [1953] as one of histoplasmosis and subsequently confirmed outbreaks of histoplasmosis among speleologists have been reported from Venezuela and South Africa [Transvaal].
>
> In Peru, histoplasmosis, known locally as 'fiebre de Tingo Maria', was associated with a cave inhabited by nocturnal, fruit-eating 'oil birds' *[Steotomis caripensis}*. The presence of Histoplasma in the cave soil was attributed to its enrichment by their droppings but the cave was also inhabited by bats. These cases are briefly reviewed by Emmons [1958] in a detailed report of a family outbreak of histoplasmosis in Maryland traced to bat guano produced by a colony of bats inhabiting the attic of the farmhouse. ...
>
> It is the habit of starlings *[Sturnus vulgaris}* to assemble at night in very large numbers at roosting sites in trees and on buildings under which guano accumulates. Starlings were intentionally introduced into Central Park, New York, in 1890 and 1891. Within a few years they established themselves in the New York area from which they spread south and west to become a major nuisance and the population of starlings is now high in the states from Ohio to Missouri and south to Tennessee where histoplasmosis is endemic.
>
> [Ainsworth 2002]

HISTOPLASMOSIS

• The yeast form of Histoplasma capsulatum causes histoplasmosis, outbreaks of which occur in families or groups exposed to bird or, especially, *bat* droppings. Prevalence increases from childhood to 15 years of age.

- Histoplasmosis is not contagious.
- Host range: humans and mammals such as bats, dogs, cats, sheep, horses, rats, mice, skunks, opossums, and foxes.
- Horses are most susceptible, with a sensitivity rate of 73%, followed by sheep with a rate of 33%. [Ainsworth]
- The shift from mould to yeast changes the chemicals making up the wall of the fungus and thus the antigens, so that the immune system must retool. This gives the fungus in immunocompromised or elderly patients the time to establish itself in the lungs.

CLINICAL FORMS

Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
Slow growth rate.
Causative agent of histoplasmosis.
Defining disease for AIDS.
Histoplasmosis may coexist with sarcoidosis or tuberculosis. Endemic in eastern and central North America.
Chickens, starlings, and bats.

• According to the National Institute for Occupational Safety and Health, forty million people in the United States are estimated to have been infected by H. capsulatum, with approximately 500,000 new infections occurring each year. Asymptomatic or mild infections due to H. capsulatum are the rule, whereas the serious chronic or disseminated types are fairly uncommon.
Transmission occurs through inhalation of airborne conidia [from disturbing spore-rich soils]. Symptoms appear within 3-18 days after exposure, commonly 10 days. Histoplasmosis may coexist with sarcoidosis or tuberculosis. Before the early 1950s the disease symptoms were widely mistaken for tuberculosis, resulting in antibacterial TB treatment. This aggravated the disease because the extermination of bacteria gave the competing fungus free play.
Histoplasmosis has a variety of alternative names: Darling's disease [named for the pathologist Samuel T. Darling, who described the infection and named the pathogen in 1906 in the belief it was a parasitic protozoan], reticuloendotheliosis, Ohio Valley disease, Central Mississippi Valley disease, tingo, histo, spelunker's disease, caver's disease, and Maria fever.

Five clinical forms are distinguished.

- Asymptomatic histoplasmosis.
- Acute benign respiratory histoplasmosis.

- Acute disseminated histoplasmosis.
- Chronic disseminated histoplasmosis.
- Chronic pulmonary histoplasmosis.

Chronic pulmonary histoplasmosis occurs most frequently in elderly men with pre-existing lung diseases such as emphysema. This form results in non- tubercular lung calcifications [which encapsulate the fungus].

In chronic disseminated histoplasmosis several organs may be involved, with clinical presentations such as lymphadenitis, anaemia, endocarditis, Addison's disease, chronic meningitis, solitary or multiple ulcerations of the mouth, pharynx, larynx, stomach, and small or large bowel, and papular to nodular skin lesions. The disseminated form is a defining disease for AIDS.

> As many as 53% of AIDS patients from endemic areas develop histoplasmosis. In addition, non-endemic cases are now being reported. Predominant findings are fever [69%], weight loss [50%], splenomegaly [33%], and adenopathy [24%]. Laboratory abnormalities include anaemia [96%], leukopenia [61%], and thrombocytopenia [40%]. On chest radiographs, interstitial infiltrates are seen in 51% of affected AIDS patients compared to 33% of normal hosts. Although infiltrates are a common finding on chest radiographs, respiratory symptoms are not predominant in AIDS cases.
> [Kern 1997]

SYMPTOMS

- Flu-like symptoms. Fever/ chills. Malaise.
- Headache.
- Anorexia. Weight loss.
- Abdominal cramps. Diarrhoea.
- Joint and muscle pain.
- Chest pain. Dyspnoea.
- Hoarseness.
- Dry, non-productive cough.
- Purulent or bloody sputum [chronic pulmonary form].
- Cyanosis.

- Increased perspiration. Night sweat.
- Lymphadenopathy.
- Swelling of liver and spleen.
- Ulcerative lesions in nose, mouth, larynx.

PARACOCCIDIOIDES BRASILIENSIS **Parac-br.**

Scientific name Paracoccidioides brasiliensis (Splend.) EP. Almeida 1930.
Synonyms Zymonema brasiliensis Splend. 1910.
Coccidioides histosporocellularis (Haberf.) Vuill. 1931.
Blastomyces brasiliensis (Splend.) Conant & Howell 1941.
Aleurisma brasiliensis (Splend.) J.A. Neves & Bogliolo 1951.
Family Onygenaceae [?].

Although the exact lineage of this dimorphic fungus has not been definitely established, its similarity in morphology and pathogenesis with members of the Onygenaceae seems to justify its placement in this family.

KEYS

- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Slow growth rate.
- Humid soils rich in proteins.
- Causative agent of paracoccidioidomycosis.
- Predilection for reticuloendothelial system, skin and mucous membranes.
- Higher incidence in males.

FEATURES

- Dimorphic fungus transforming from one morphological form to another based upon temperature. It is a slow-growing white [saprophytic] mould at room temperature [colonies mature in 2 to 3 weeks] and converts into a budding yeast at 35-37° C [body temperature].
- The yeast form produces multiple daughter cells [buds] attached to it by a narrow neck and surrounding it like the handles of a ship's steering wheel. [Other yeasts produce one daughter cell at a time.]
- Has been isolated from soil and the digestive tract of some animals, however its natural habitat remains obscure. Has been cultivated from fruit bats and armadillos, [www.doctorfungus.org]
- Mostly resides in soil that is humid and rich in proteins.
- Geographically confined to areas of South and Central America, predomi- nandy subtropical forest areas. "The mycosis is recognized as the most severe

mycotic disease in Brazil and it ranks high with other infectious diseases as a public health problem in that tropical country," wrote Emmons in 1977.

PARACOCCIDIOIDOMYCOSIS

• Paracoccidioides brasiliensis is the causative agent of a true systemic [endemic] mycosis called paracoccidioidomycosis. The disease, also known as 'South American blastomycosis', was first described in 1908 by Lutz from Brazil as 'pseudococcidioides granuloma'. The spectrum of the disease is wide, varying from an asymptomatic infection verified by the skin test to a sub clinical, symptomatic or chronic infection. Diagnosis of paracoccidioidomycosis is often difficult. The infection may become apparent several years after exposure to Paracoccidioides brasiliensis, suggesting the possibility of a long latent period.

The infection is presumably acquired via inhalation of the conidia, followed by primary infection of the lungs. The degree of pathogenicity may vary and appears strain-dependent. In addition to the primary pulmonary form of the disease, acute pulmonary, chronic pulmonary, and disseminated forms may also be observed. In cases of disseminated paracoccidioidomycosis, reticuloendothelial system, skin and mucous membranes are frequendy involved. Other clinical presentations include lymphadenopathy [massive enlargement of the lymph nodes of the neck is in many cases an early sign of the presence of the disease], dysphagia, and hoarseness.

Finally a clinical picture identical to pulmonary tuberculosis [fever, weight loss, night sweats, and productive cough with blood-streaked sputum] may occur. Aortitis may develop. Given the true systemic nature of paracoccidioidomycosis, otherwise healthy individuals are affected.

Paracoccidioidomycosis affects primarily men [men/ women ratio 15:1] between 30 and 50 years. ... [The high incidence in adult males - farmers and agricultural workers in particular [esp. in the coffee-growers of Brazil and Colombia, according to the Merck Manual] - is thought to be the combined effect of their hormonal makeup and their occupations.]

Treatment regimes are very long and relapse is frequent. *P. brasiliensis* has the peculiarity among the fungi of responding to treatment with sulpha drugs, although maintenance treatment of up to 5 years is required.

[www. doctorfungus. org]

Scientific name Sporothrix schenckii Hektoen & C.F. Perkins 1900.

Synonyms Sporothrix asteroides (Splend.) Davis 1913.
Sporotrichum schenckii Hektoen & C.F. Perkins.
Sporotrichum tropicale Panja, Dey & Ghosh 1947.

Family Ophiostomataceae.

III. ORDER OPHIOSTOMATALES

Contains 150 species in 15 genera. The asci autolyse early, forming slimy droplets containing the spores.

III A. FAMILY OPHIOSTOMATACEAE

Sporothrix schenckii

SPOROTHRIX SCHENCKII

Sporot.

KEYS

- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Causative agent of sporotrichosis, a generally indolent infection more frequently occurring in males.
- Wound invader through puncture wounds.
- Rose grower's disease.
- Chancre-like skin lesions with nodular lymphangitis.
- Systemic form involves the bones and joints, the lungs, and the meninges.
- Syphilitic miasm.
- Warm compresses >.

FEATURES

• The genus Sporothrix contains five active species. The most common one is S. schenckii, followed by S. cyanescens.

Paracoccidioidomycosis differs in notable respect from blastomycosis by its predilection for the mucosal tissues, by the frequency of gingival lesions with loosening and loss of teeth, by the crusted character of skin lesions without tendency to central healing and thin, smooth scar formation and by the prominence of regional and generalized lymphadenopathy. It must be differentiated also from tuberculosis, cutaneous tuberculosis, syphilis, yaws, sporotrichosis, and leishmaniasis. ...

A characteristic feature of paracoccidioidomycosis is a strong tendency to involve lymphoid tissue. This may first occur in lymph nodes that drain lesions of the skin and mucous membranes or it may be demonstrated by widespread involvement of lymphoid tissue including the spleen. The entire lymph node may be involved by necrosis, focal or diffuse. In contradistinction to blastomycosis, lesions of the intestinal tract are very common in this disease and appear to begin in the lymphoid tissue of the mucous membrane.

[Emmons 1977]

Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen. Slow growth rate. Humid soils rich in proteins. Causative agent of paracoccidioidomycosis. Predilection for reticuloendothelial system, skin and mucous membranes. Higher incidence in males.

• The ileocaecal region is the most frequent site of involvement regarding the intestinal tract.

• Following oral infection, e.g. from cleaning the teeth with twigs and pieces of vegetation as is common in rural areas of South America or from chewing contaminated vegetable matter, a severe, ulcerative and painful stomatitis develops. The slowly spreading ulcers have a granulomatous, sometimes mulberry-like base. The ulcers may spread to adjacent tonsils, tongue, palate, gums, nasal mucosa, and face. The ulcerative process loosens the teeth, which are frequently lost by spontaneous shedding or by extraction. Malnourishment and cachexia result from the inability to eat.
Cutaneous ulcers, abscesses and fistulae disfigure the face, which is the most common site of secondary infection.

• In most cases pulmonary lesions are bilateral and symmetrical. Calcification has not been observed. About 10 to 15% of the patients acquiring pulmonary paracoccidioidomycosis have also tuberculosis, carcinoma or sarcoidosis. Paracoccidioidomycosis has not been reported in patients with AIDS.

- Derives its name from R.B. Schenck, who first reported the infection in 1898.
- Dimorphic: either a mould or a yeast, depending on the temperature of growth.
- Mould at 25° C, growing as moist, leathery to velvety colonies, white initially, dark brown to black when ageing.
- Converts into the yeast form at 37° C [hence at body temperature].
- The yeast form consists of cream-coloured, moderately fast growing colonies with a dry, wrinkled surface.
- Fungus sensitive to temperature; does not survive above 39° C.
- Worldwide distribution.
- Saprophytic [mould] in soil; living and decaying plants; barks; timbers; straw; sphagnum moss.
- Plants known to harbour this fungus include roses, barberry [Berberis], sphagnum moss, salt-marsh hay, horsetails [Equisetum], carnations [Dianthus], cacti, and prairie hay.
- Wound invader.

SPOROTRICHOSIS

- Sporotrichosis may remain localized or may become generalized [systemic], involving bones and joints, lungs, and the meninges.
- In general known as rose handler's [or grower's or picker's] disease, peat moss disease, Schenck's disease, and Beurmann's disease.
- Sporotrichosis is more frequent in males [due to occupational-related risks].
- Sporotrichosis is in general an indolent infection.
- Cats are unique in the epidemiology of sporothrichosis. This is because the fungus, as it occurs in skin lesions and abscesses in cats, can infect humans through intact skin [i.e., without the need for a pre-existing wound]. As such, it poses a direct threat to cat owners and veterinarians. [U.S. Department of Veterinary Pathology]
- Several clinical manifestations are distinguished: subcutaneous; lympho-cutaneous; pulmonary; disseminated.

CUTANEOUS SPOROTRICHOSIS

- Most commonly affects the dorsum of the hands or fingers.

• The fungus, in the form of mould spores or mycelial fragments, enters through skin wounds, e.g. from rose or barberry thorns, pine needles, wood splinters, sphagnum, or infected cats. Once inside the host, it becomes yeastlike. A reddish, nodular papule develops 20-90 days after inoculation. It slowly enlarges, becomes pustular and eventually ulcerates.
• Fixed sporotrichosis evolves locally without spread and is known as non-lymphatic sporotrichosis. This appears as a scaly, acneiform, verrucous or ulcerative nodule that remains localized.
• Lesions may be granulomatous, suppurative, ulcerative, draining, or in crusted verrucous plaques.
• Primary lesions resemble chancres [sporotrichotic chancres].
• Ulcers have ragged undermined margins and serosanguineous discharge.
• Plaques and fixed type of lesions can persist for years, the longest being known to persist for 26 years. Spontaneous resolution is not common; the lesion may temporarily wane, but it regresses eventually.
• The characteristic inflammation is well circumscribed and granulomatous with central areas of acute suppuration.
• Cutaneous sporotrichosis is an occupational hazard for forest employees [accounting for 17% of cases, according to one study], gardeners and florists [10%], and other soil-related professions [16%]. Others with an increased risk include carpenters and masonry workers.
• It is the only common cutaneous mycosis in the temperate zone.

LYMPHOCUTANEOUS SPOROTRICHOSIS

• Spreading via the lymphatic system, the infection progresses up the arm in a linear array [usually stopping at the axilla] with ulceration, abscess formation resembling boils, and breakdown of the abscess with discharge of pus followed by very slow healing. It forms a chain of indolent nodular and ulcerating lesions that typifies this form. The ulcers do not heal and may remain open for years. Nodular lymphangitis may develop up to 3 months after injury. Direct application of heat may kill the fungus in early infection, especially in more distal lesions, because S. schenckii does not survive above 39° C. Homeopathically, this makes amelioration by hot applications a likely modality.
• Subcutaneous and lymphocutaneous sporotrichosis typically are apyretic and almost painless. Constitutional effects such as malaise or ill feeling are lacking.

PULMONARY SPOROTRICHOSIS

- A rare form follows inhalation of the fungus. A chronic, cavitary pneumonia, which is clinically and radiographically indistinguishable from tuberculosis and histoplasmosis, occurs in patients who usually have severe underlying chronic obstructive pulmonary disease [COPD].
- May produce pleural effusion and hilar lymphadenopathy.
- Symptoms are aspecific: cough; low-grade fever; weight loss; sputum production.
- Associated with corticosteroid use, sarcoidosis, and tuberculosis.
- The infection may remain localized to the lung or may disseminate to other body sites.
- Workers exposed to large quantities of sphagnum moss are likely to inhale large amounts of Sporothrix spores.

SPOROTRICHOSIS ARTHRITIS

- The knee is typically involved in cases of monoarthritis. In polyarthritis other joints [hands, elbows, ankles] become involved successively.
- The spine, hips and shoulders are usually not involved.
- There is usually pain on motion, but not the severe limitation characteristic of bacterial arthritis. Systemic illness usually is absent.
- Chronic sporotrichosis arthritis is often confused with rheumatoid arthritis or other chronic inflammatory arthritis.
- Multifocal tenosynovitis and arthritis may mimic gonococcal infection.
- Slowly progressing development - often 10 years or more - into arthrosis or appearance of draining fistulae.
- No involvement of subcutaneous tissues or lymphatics.

Osteoarticular which involves the bones, joints, and bursa. The majority of patients in this category present with the indolent onset of stiffness and pain in a large joint. Radiological evidence of osteomyelitis develops slowly with diffuse osteolysis. Almost all cases of arthritis involve knee, elbow, ankle or wrist. Although fever may be present early in the illness, most patients are afebrile.

Fluid accumulation in the olecranon or prepatellar bursa may occur as may Baker's cysts. In untreated patients, additional joints become involved and

a draining sinus.
[Padhye, Sporotrichosis - An Occupational Mycosis; http://www.fcnanet.org/proceedings/1995/padhye.pdf]

DISSEMINATED SPOROTRICHOSIS

• Granulomatous tenosynovitis and carpal tunnel syndrome, bursal infection, invasive sinusitis, orchitis, and mastitis have been described.
• The most common extracutaneous sites are in the bones, joints, tendon sheaths, and bursae.
• Sporotrichosis rarely may involve other organs, including the eye, the prostate, the oral mucosa, and the larynx.
• Haematogenous dissemination results in widely disseminated cutaneous and visceral infection, including meningitis.
• Erythema nodosum and vascular lesions resembling polyarteritis nodosa [Kussmaul's disease] have been reported in patients with sporotrichosis.
• Multiple crusted and ulcerating papular nodules with widespread distribution may occur. The palms of the hands and the soles of the feet, however, are never affected.
• Disseminated sporotrichosis may develop in patients with AIDS, diabetes mellitus or alcoholism.
• Central nervous system sporotrichosis or sporotrichosis meningitis is rare; clinical features are headaches, backache, and mental confusion.
[Data collated from http://www.doctorfungus.org/Mycoses/human/sporo/sporotrichosis.htm and http://www.emedicine.com/MED/topic2161.htm]

SYPHILITIC MIASM

• "Resemblance of sporotrichosis to common forms of tuberculosis, syphilis, and other infections may often lead to diagnostic errors," wrote Gray in 1959. There is plenty of evidence that sporotrichosis falls under the syphilitic miasm: the painless chancre-like lesions, the indolent development, the lymphatic involvement, the slowness or absence of healing of skin ulcers, the slow destruction, the lack of constitutional response [paucity of symptoms], immunosuppression and/ or alcoholism as predisposing factors; all major keynotes of the syphilitic miasm. [Sporotrichosis is sometimes called *alcoholic* rose gardener's disease.]

Scientific name Stachybotrys chartarum (Ehrenb.) S. Hughes 1958.
Synonyms Stilbospora chartarum Ehrenb. 1818.
Stachybotrys atra Corda 1837.
Stachybotrys alternans Bonord. 1851.

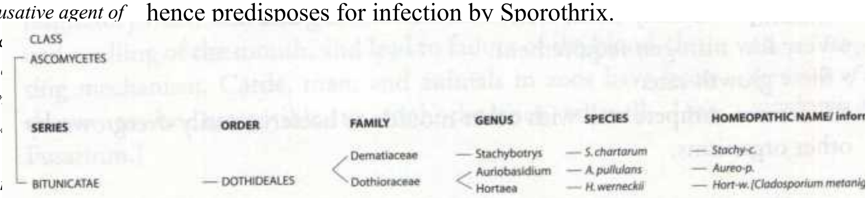
Family Dematiaceae

Series Bitunicatae

Bitunicate Asci have a double wall. At maturity the thin outer wall splits, and the thick inner wall absorbs water and expands upward, carrying the ascospores with it.

I. ORDER DOTHIDEALES

Large and diverse order containing 50 families, 650 genera, and 6300 species. Its taxonomy is confusing and controversial.



I A. FAMILY DEMATIACEAE

STACHYBOTRYS CHARTARUM

Stachy-c.

KEYS

- Black mould.
- High moisture requirement; low nitrogen requirement.

In view of the fact that the tuberculinic miasm comprises a combination ofpsoric and syphilitic elements, we can say that Sporothrix is at the syphilitic pole of the miasmatic spectrum, whilst Penicillium, Aspergillus and Botrytis, with their distinct allergic tendencies, are at the psoric pole.

The low syphilitic state finds its match in the insidious nature of Sporothrix infection. It takes the organism 20 to 90 days to react. The fungus doesn't readily reveal its presence; it is "usually quite sparse within the tissues" and thus difficult to detect. When found, the yeast often resides within microabscesses or within macrophages and giant cells.

Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen. Causative agent of sporotri… ally in… r… occu… th… wounds. Rose grower's disease. Chancre-like skin lesions with nodular lymphangitis. Systemic form involves the bones and joints, the lungs, and the meninges. Syphilitic miasm. Warm compresses >.

The absence of fever implies defectiveness of the body's defence mechanisms, because if it could produce fever, it would make short work of the intruding fungus. This inability to respond with fever, again, is a typical trait of the syphilitic miasm and hence predisposes for infection by Sporothrix.

employment of the drug "as a specific for the third stage of syphilis."

Blumgarten's *Materia Medica for Nurses,* 1923, states that the treatment with potassium iodide in syphilis "must be continued for about three years; even if the patient has no symptoms, to eradicate all the poison from the body." The drug was also thought "to increase the absorption of inflammatory swellings of the glands and other tissues, to absorb fluids in the chest, and to increase the secretions of the mucous membranes."

Aside from certain mycoses, such as sporotrichosis, the use of potassium iodide is largely abandoned due to the common occurrence of a number of adverse effects, including inflammation of lachrymal, salivary and parotid glands, gastrointestinal disturbances, acneiform skin eruptions, erythema of face and chest, coryza, and hypothyroidism.

The aetiology of puncture wounds suggests Sporothrix as a possible alternative for Ledum, another syphilitic remedy. The modalities make them easy to differentiate. Ledum is better by cold application, Sporothrix by warm compresses.

- Cellulose.
- Haemorrhages.
- Irritation of mucous membranes and skin.

FEATURES

- First described as S. atra by Corda in 1837 from wallpaper collected in a home in Prague.
- Ubiquitous [greenish] black mould common on plant debris and in soil.
- High moisture requirement; grows vigorously where moisture accumulates indoors.
- Not easily airborne due to its slimy, sticky spores.
- Favours substrates high in cellulose [leaves; hay; straw; paper; wallpaper; cotton], particularly when wet.
- Very low nitrogen requirement.
- Slow growth rate.
- Does not compete well with other moulds or bacteria; easily overgrown by other organisms.

HISTORY

- As the notorious subject of a number of building related illness investigations, Stachybotrys chartarum is now regarded in some quarters as a serious threat to human health. Its bad reputation is founded on its implication as a causative agent of pulmonary haemorrhage [coughing up blood or epistaxis] observed in ten infants in 1993 and 1994 in Cleveland, Ohio.

A 1994 report by the U.S. Centres for Disease Control entitled “Pulmonary Hemorrage/Hemosiderosis Among Infants - Cleveland, January 1993- November 1994” stated that the symptoms were associated with living in water-damaged homes infested with Stachybotrys.

The report was criticized for technical inadequacies and the CDC reversed its conclusions in 2000.

It has been argued that the fungus produces its toxins only under very specific stress conditions; that its spores, which contain the toxins, do not tend to become airborne; and that one has to inhale massive amounts of these spores over a prolonged period of time to get the required concentration of toxin to cause illness. Such dose-response related arguments are statistical in

nature and fail to take into account the key issue of individual susceptibility. The potential toxicity of S. chartarum is beyond doubt, a fact blown out of proportions, however, by the popular media portraying it as a "toxic mould killing your children" and a permanent indoor hazard by its mere presence.

STACHYBOTRYOTOXICOSIS

• Horses seem to be especially susceptible to the toxins produced by S. chartarum. In the early 1930s Stachybotrys toxins caused the death of thousands of horses in the Ukraine during the winter months, when the animals are stabled, but the cause was only established some years later as having been mouldy hay and straw. These toxins are macrocyclic trichothecenes, which cause inflammatory lesions of the respiratory tract, skin and gastrointestinal tract, fever, ulceration and swelling of the mouth, and lead to failure of the blood-clotting mechanism. Cattle, man, and animals in zoos have been shown to be susceptible to trichothecenes as well. *[See* Fusarium.]

Black mould.
High moisture requirement; low nitrogen requirement.
Cellulose.
Haemorrhages.
Irritation of mucous membranes and skin.

> Field cases [of stachybotryotoxicosis] have involved large numbers of horses, although occasional outbreaks have also been reported in cattle. The disease is seasonal in character, appearing when animals are fed hay and straw during winter months. The toxicosis may run a typical clinical course in three stages, or it can assume an atypical form. In the typical form, the first signs of toxicity are reflected in stomatitis, resulting in local response to the toxic agents. After a period of eight to twelve days, the second stage develops, in which systemic effects appear. This stage is characterized by progressive leukopenia, agranulocytosis, and thrombocytopenia, and lasts for 15 to 20 days. With continued intake of toxic straw, the toxicosis proceeds into a third stage, accompanied by fever and intensification of blood changes. Blood-clotting mechanisms are almost completely impaired.
>
> In its atypical form, stachybotryotoxicosis is characterized by sudden onset [72 hours], absence of blood dyscrasia, and signs of acute shock. Death ensues in all animals in this less common form of the syndrome. Pathologic findings in the disease are the same in both forms, consisting mainly in widespread necrosis in most tissues as well as generalized haemorrhages.
>
> [H. Riemann (ed.) - *Food-borne Infections and Intoxications;* New York, 1969]

- In people handling or being in close contact with hay or feed grain contaminated with this mould results in symptoms such as
  - Burning sensations of the mouth and nasal passages.
  - Burning and watering eyes.
  - Bloody nasal discharge.
  - Headache.
  - Tightness of the chest.
  - Cough.
  - Low-grade fever.
  - Rashes and itching at the point of contact, especially in areas of heavy perspiration, such as the armpits or the scrotum.

- Individuals with chronic exposure to the toxin produced by this fungus reported cold and flu symptoms, sore throats, diarrhoea, headaches, fatigue, dermatitis, intermittent local hair loss and generalized malaise.

I B. FAMILY DOTHIORACEAE

Aureobasidium pullulans
Hortaea werneckii

AUREOBASIDIUM PULLULANS **Aureo-p.**

Scientific name Aureobasidium pullulans var. pullulans (de Bary) G. Arnaud 1918.
Synonyms Dematium pullulans de Bary & Lowenthal 1866.
Cladosporium metanigrum de Bary 1918.
Pullularia pullulans (de Bary & Lowenthal) Berkhout 1923.
Hormonema pullulans (de Bary) Robak 1932.
Pullularia fermentans Wynne & Gott 1956.
Aureobasidium pullulans var. melanogenum Herm.- Nijh. 1977.
Family Dothioraceae.

NOTE: This species is in French homeopathy regarded as synonymous with Cladosporium metanigrum, following a description by the French mycologist Anton de Bary published in 1918. The taxonomy of Cladosporium metanigrum has been revised in the 1970s, which has resulted in a number of new synonyms. *[See* Hortaea.]

KEYS

- Black yeast-like mould.
- Saprophytic with pathogenic potential.
- Requires wet conditions.
- Sensitive to heat.
- Produces pullulans, used for the manufacturing of oxygen-impermeable films and adhesives.
- Allergenic [hay fever and asthma].
- Dermatitis. Subcutaneous cysts.

FEATURES

- Yeast-like *black* filamentous fungus. “Black yeast.”
- Ubiquitous in soil [surface layer, increasing in abundance following nitrogen fertilisation] but has its principal habitat within the aerial parts of plants.
- Isolated from a great number of habitats, e.g., fresh and salt waters/sedi- ments, the rhizosphere of grasses, wet and decomposing wood, compost, seeds, honeycombs, nests and feathers of living birds, frozen fruitcake, leather, cotton fabrics, concrete surfaces, paint, plastic, optical lenses, and human lymph nodes.
- Often the dominant fungus found on leaves.
- Spores travel in water droplets or on wet materials.
- Primary invader of all kinds of leaves, decomposing the ageing leaves in autumn.
- Causes decay of legumes, tomato, and sauerkraut.
- Sensitive to heat.
- Most common in temperate zones.
- Indoor growth widespread, where moisture accumulates, esp. bathrooms and kitchens, on shower curtains, tile grout, windowsills, textiles, liquid waste materials. Often found on silicon-based caulking.
- Primary colonizer of broadloom carpeting following water damage.
- Forms moderately rapidly growing, moist, pasty colonies, shiny and leathery in appearance. The surface is white, pale pink or yellow in the beginning and becomes brown to black with age.
- Saprophyte. Potential pathogen.
- Produces pullulan, a biodegradable, water-soluble polysaccharide that can be used to make oxygen-impermeable films and adhesives and is employed for packaging of food and drugs.

Pullulan consists of fibres with a shiny gloss like rayon and the strength of nylon.

ALLERGEN

- The U.S. Government’s Occupational Safety and Health Administration [OSHA] lists Aureobasidium pullulans as an allergen [hay fever and asthma] and irritant, and as a cause of hypersensitivity pneumonitis and dermatitis.
- Positive skin tests as well as provocation test reactions to this fungus are

commonly observed. It has been found to be a frequent sensitizing agent.

- The organism may also colonize hair, skin, and nails in humans.
- Associated with:
  - Humidifier fever or air-conditioner disease.
  - Sauna taker's disease.
  - Sequoiosis.

- Humidifier fever has been related to exposure to toxins from micro organisms found in wet or moist areas in humidifier reservoirs, air conditioners or aquaria. Symptoms are influenza-like and include fever, headache, chills, muscle ache, and malaise. Prominent pulmonary symptoms are lacking. . ,

. Sauna taker's disease or sauna taker's lung arises from exposure to mould growing in sauna bath water containers.

- Sequoiosis results from the inhalation of fungal spores contained in re wood sawdust.

- Aureobasidium pullulans is one of the causative agents of phaeohyphomy- cosis. It may cause keratomycosis, pulmonary mycosis with sepsis and other opportunistic infections, as well as cutaneous mycoses such as eumycotic dermatitis.

Phaeohyphomycosis manifests as the formation of subcutaneous cysts, which may progress to chronic or systemic infections. Systemic infections disseminate rapidly in immunocompromised patients. The disease is caused by a variety of fungi producing brown-black structures ['phaeo from Gr phaios, dusky]. The implantation of the fungus results from a trauma and develops shortly after infection into a subcutaneous encapsulated abscess with an elevated nodule. The central area becomes necrotic and fills with yellowish, viscous, purulent fluid, containing yeast-like cells and/or hyphae.

- *Homeopathic use.* .

Itching vesicles on sides of fingers, containing transparent fluid; desquamation of skin.

Flatulence with offensive flatus in afternoon and evening.

[M. Ptok, *Der Wert der Nosoden;* Allg. Hom. Zeitung, 5/99.]

HORTAEA WERNECKII **Hort-w.**

Scientific name Hortaea werneckii (Horta) Nishimura & Miyaji 1984.
Synonyms Cladosporium werneckii Horta 1921.
Pullularia werneckii (Horta) G.A. deVries 1952.
Exophiala werneckii (Horta) Arx 1970.
Phaeoannellomyces werneckii (Horta) McGinnis & Schell 1985.
Old name Cladosporium metanigrum.
Family Dothioraceae.

Data from Fungi database of Centraalbureau voor Schimmelcultures, Baarn, The Netherlands.

KEYS

- Dimorphic fungus: yeast when young, a mould when mature.
- Commensal on normal skin [feeds on decomposed lipids].
- Halophilic [salt-loving].
- Converts tyrosine to melanin.
- Causative agent of skin infections, esp. in people with profuse sweating.
- Tinea nigra, typically occurring in coastal areas.
- Higher incidence in females.

FEATURES

- Dimorphic: a yeast when young, a mould when mature.
- Inhabits soil, rotting wood pulp, decaying vegetation, and sewage.
- Commensal on normal skin.
- Halophilic [salt-loving]; has been isolated from saltwater fish and from salterns.
- Optimal growth at natrium chloride concentration of 17%.
- Decomposes casein and converts tyrosine to melanin.
- Optimum growth temperature: 30° C; does not grow at 37°C.
- Forms slow-growing yeast-like colonies, initially pale in colour, mucoid, and shiny, and with age becoming *mould* colonies, very dark olive-green to olive-black, velvety, and covered with a thin layer of mycelium.

DERMATOMYCOSIS

- Cause of human skin infections [phaeohyphomycosis], particularly in tropical and subtropical climates, often infecting people with a tendency to excessive sweating.
- Its tolerance to an environment with a high salt concentration and a low pH allows the fungus to thrive in human skin.
- Feeds on decomposed lipids.
- Causative agent of tinea [pityriasis] nigra, a superficial infection of the stratum corneum marked by brown to black, flat, non-scaling lesions giving a spattered appearance. The lesions occur most commonly on the palms of the hands, but may also appear on the palmar aspects of the wrists and fingers. While most of the patients do not have any symptoms related to these lesions, some may have itching. [The term tinea is misleading since it is not a form of ringworm.]
- Tinea nigra typically affects people who reside in coastal areas.
- Occurs three times more often in females than in males. Affects most often children and adolescents.

Dimorphic fungus: yeast when young, a mould when mature.
Commensal on normal skin [feeds on decomposed lipids],
Halophilic [salt-loving].
Converts tyrosine to melanin.
Causative agent of skin infections, esp. in people with profuse sweating.
Tinea nigra, typically occurring in coastal areas.
Higher incidence in females.

I C. FAMILY PLEOSPORACEAE

Alternaria alternata

ALTERNARIA ALTERNATA

Alter-a.

Scientific name	Alternaria alternata (Fr.) Keissl.	1912.
Synonyms	Torula alternata Fr. 1832.	
	Alternaria tenuis Nees.	
Family	Pleosporaceae.	

KEYS

- Saprophytic mould.
- Plant pathogen producing mycotoxins.
  Requires moisture, but survives dry conditions.
- Increased spore dispersal when relative humidity drops.
- Allergies. Asthma.
- Warm, humid weather <.
- Chronic sinusitis [maxillaris].

FEATURES

- Belongs to a genus of about 50 species of common saprophytic or plant pathogens causing leaf spot, stem rot and root rot diseases, e.g. early blight of potato, brown rot of apples, and tomato rot.
- Major decomposer of any organic material, including kerosene.
- As decomposers of foodstuffs, Alternaria spp. are ubiquitous post harvest pathogens and contribute to the spoilage of 20-40% of agricultural output.
- A. alternata is probably the most important mycotoxin-producing species and occurs on cereals, sunflower seeds, oilseed rape, tobacco, olives, fruits, vegetables, as well as in soil, rotting farmland manure, and indoor air environment.
- Often found growing on carpets, textiles and horizontal surfaces prone to condensation such as window frames.
- Requires moisture, yet survives dry conditions and drought.

• Disperses dry spores, outdoor levels of which peak when airspeed rises and relative humidity falls, e.g. during summer afternoons.
• Produces melanin-like pigments.
• Forms rapidly growing colonies, greyish white at the beginning to become olive brown to greenish black with a light border with age.
• Optimum growth temperature: 20-30° C.; minimum: 0-5° C.; maximum: 35° C. [Roth]
• Significant fungal growth has been noted on walls of the ruin of the Chernobyl nuclear power plant. Of the 37 species detected, Alternaria alternata and two other species were found more typically in the severely contaminated areas, suggesting that these species may be active biodestructors of extremely radioactive substrates.

TOXINS

• The various species produce a wide range of mycotoxins and phytotoxins, of which about 70 have been identified.

• Tenuazonic acid, produced by A. alternata and A. tenuis, exhibits antitumour, antiviral and antibacterial activity. Like most Alternaria mycotoxins it has considerable cytotoxic activity. The compound is lethally toxic to young birds and in administration to animals produced effects such as salivation, vomiting, anorexia, erythema, gastrointestinal haemorrhage, growth retardation, and convulsions.
Since Alternaria causes a very common rot in tomatoes and apples, contamination of tomato paste and apple juice is likely. Tenuazonic acid levels of 0.1-1 ppm have been detected in commercial tomato pastes.

PATHOGENICITY

• Of the Alternaria spp., Alternaria alternata has been positively associated with a number of infections including phaeohyphomycosis, onychomycosis [fungal infection of nail], sinusitis [allergic fungal sinusitis], keratitis, and osteomyelitis.
This organism may cause localized tissue destruction, usually in the nasal region. Its colonization of the paranasal sinuses results in chronic hypertrophic sinusitis.

It is also among the causative agents of otitis media in agricultural field workers.

ALLERGIES

• Alternaria species are one of the most prevalent fungi identified, worldwide, on aeroallergen surveys and by testing allergy patients, with Alternaria alternata usually being estimated as the most important one. Alternaria sensitization has been determined to be one of the most important factors in the onset of childhood asthma. It is regarded the main cause of allergy and asthma in children aged 6-11 years and it has been found that young atopic individuals with respiratory disorders when aged 14-19 years react in the skin test to *Alternaria* spp. more often [20% positive] than when aged over 30 years. Extracts of this species produce positive skin prick test reactions in about 15- 20% of patients with seasonal eczematous dermatitis.

Saprophytic mould. Plant pathogen producing mycotoxins. Requires moisture, but survives dry conditions. Increased spore dispersal when relative humidity drops. Allergies. Asthma. Warm humid weather < Chronic sinusitis [maxillaris].

• Has been recognized to cause type I and type III allergic responses. Implicated in bakers asthma, farmer's lung, wood pulp worker's lung, and hay fever.
Acute symptoms include oedema and bronchi spasms, chronic cases may develop pulmonary emphysema.
A European Community epidemiological respiratory health survey of 1132 asthmatic adults aged 20-44 years found that the frequency of sensitization to moulds [Alternaria alternata or Cladosporium herbarum, or both] increased significantly with increasing asthma severity, whilst there was no association between asthma severity and sensitization to pollens or cats.

A group of Italian investigators looked at the prevalence of Alternaria sensitization in nearly 3,000 patients suffering from respiratory symptoms. They found that 12% of Alternaria positive patients reacted to only this one allergen, and of the entire group of Alternaria positive patients, 79.7% had symptomatic rhinitis and 53.3% had asthma.

- Associated with increase of asthma from changes to warm, humid weather.
- Allergic cross-reactions have been observed between Alternaria sensitivity and consumption of raw mushrooms.

CLASS SACCHAROMYCETES

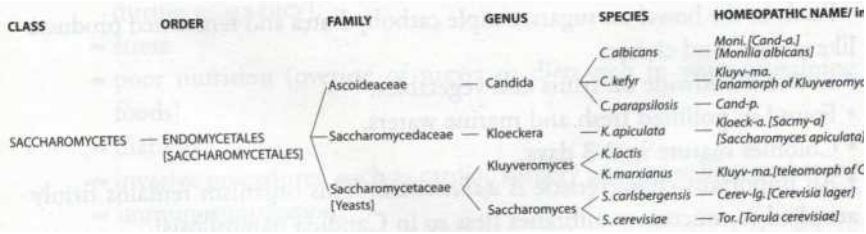
ORDER ENDOMYCETALES
[SACCHAROMYCETALES]

I A. FAMILY ASCOIDEACEAE
Candida albicans
Candida kefyr
Candida parapsilosis

CANDIDA

FEATURES OF THE GENUS CANDIDA

- The genus Candida includes around 154 species of saprophytic jrart-like fungi forming rapidly growing, moist, smooth, glabrous, and usually white to cream-coloured colonies.
- Common in soil, organic debris, and hospital environments.
- Six species are most frequently isolated in human infections: Candida albicans [70-90% of cases]; C. tropicalis; C. glabrata; C. parapsilosis; C. krusei;
and C. lusitaniae.



CANDIDA ALBICANS **Moni. [Cand-a.]**

Scientific name	Candida albicans (C.P. Robin) Berkhout	1923.
Synonyms	Oidium albicans C.P. Robin 1853.	
	Monilia albicans (C.P. Robin) Zopf 1890.	
Family	Ascoideaceae.	

KEYS

- Rapidly growing dimorphic fungus, changing from yeast-like to filamentous.
- Part of the normal flora in the throat, vulvovaginal area, lower intestinal tract, and skin.
- Feeds on sugars and other simple carbohydrates.
- Causative agent of candidiasis.
- Brain fog. Spaciness.
- Mood swings.
- Anger and aggression.
- Sugar craving. Hypoglycaemia.
- Digestive problems.

FEATURES

- Candida albicans is commonly found as an endogenous inhabitant of the alimentary tract and the mucocutaneous regions of the body, “where it lives in a delicate competitive balance with bacteria and other microflora of the digestive tract” [Hudler].

It particularly exists as normal flora in the throat, vulvovaginal area, lower intestinal tract, and skin.

- Endogenous organism in humans, animals, and birds; has been isolated from the faeces of animals [especially swine].
- Feeds in the bowel on sugars, simple carbohydrates and fermented products like alcohol and cheese.
- Found worldwide on fruits and vegetables.
- Found in polluted fresh and marine waters.
- Colonies mature in 2-3 days.
- An important characteristic is *adhesiveness.* This organism remains firmly attached to mucous membranes [less so in Candida parapsilosis].

NOMENCLATURE

This species is included in the repertory under the abbreviation *Moni.*
The genus Monilia formerly included plant pathogens as well as species affecting humans and animals. For that reason the genus has now been divided into two distinct genera. The generic name Monilia is reserved for species pathogenic to plants/ fruits [causing brown rot of stone fruits] and the genus is placed in the family Sclerotiniaceae [fungi forming sclerotia], along with, for example, Botrytis cinerea *[see].* Monilia has its teleomorphs in *Monilinia.*
The generic name Candida, on the other hand, is preferred for "human" species, species that have their reservoir in humans and animals. Some members of the genus Candida are normal components of the intestinal microbiota. Disturbance of the gut flora can trigger them to overgrow and become pathogenic, either locally or systemic.
For Candida albicans, the accurate homeopathic abbreviation would consequently be *Cand-a.,* combining the generic name Candida with the specific name albicans to enable differentiation with other Candida species.

CANDIDIASIS

- The vast majority of Candida infections, commonly referred to as yeast infections, are caused by Candida albicans.
- Problems occur when the numbers of Candida in the body get out of control. This is due to disturbance of the microflora and may result from:

  » abuse of antibiotics.
  = hormonal imbalance [use of oral contraceptives is a major factor, as is pregnancy since vaginal secretions have higher glycogen levels during pregnancy].
  = stress.
  <= poor nutrition [overuse of sugars or diets rich in yeast-containing foods].
  <= diabetes.
  » invasive procedures, such as cardiac surgery and indwelling catheters. = immunosuppression.
- Proliferating in the intestines, Candida changes its anatomy and physiology

from the yeast-like form to the mycelial fungal form. [Dimorphism.]

- While the yeast-like state is non-invasive and sugar-fermenting, the fungal state produces invasive, very long root-like structures that penetrate the mucosa.
- The establishment of infection with Candida species appears to be a property of the host - not the organism. *The more debilitated the host, the more invasive the disease.*
- In the past two decades Candida spp. have become the fifth most common cause of hospital-acquired bloodstream infections.

- Candida proliferation has as one of its characteristic symptoms a "greed for Pane [bread], Potatoes, Pizza, or Pasta."

MANIFESTATIONS

- "The expression of candidiasis is remarkable for its diversity," declares Ainsworth. "With the exception of the hair, virtually no part of the human body is immune from infection which may occur at any time from the prenatal and neonatal periods to terminal illness in old age. The classical location for candidiasis is the mouth [thrush], especially of infants, although denture stomatitis associated with Candida in the elderly has a higher incidence."

- In general, two major clinical types can be distinguished: Candidiasis of skin and mucosa, and Invasive [or Systemic] Candidiasis.

Types of Candidiasis of skin and mucosa

- Cutaneous candidiasis.

  Intertriginous infections [intertrigo] appear as well-demarcated, erythematous, sometimes itchy, exudative patches of varying size and shape. The lesions are usually rimmed with small, red-based pustules and occur in the axillae, inframammary areas, umbilicus, groin, and gluteal folds [e.g., diaper or nappy rash], between the toes, and on the finger webs. [Merck Manual]

  Interdigital infection involves the finger webs and extends a short distance onto the sides of the fingers. Infected areas consist of rounded patches of white, macerated epidermis, with red fissures in the centres of the lesions. Sometimes the entire area flakes off, exposing a moist red base.

- Chronic mucocutaneous candidiasis.

  Affects the skin, scalp, nails, and mucous membranes; often associated with endocrinopathy, e.g. hypothyroidism, hypoparathyroidism, hypo- adrenalism, ovary deficiency, diabetes mellitus, or growth hormone insufficiency. Also associated with herpes simplex, herpes zoster, pernicious anaemia, and iron deficiency. Skin lesions characterized by red, pustular, crusted, and thickened lesions, especially on the nose and forehead. Mucosal involvement includes chronic oral candidiasis [thrush], which may be related to inhaled corticosteroid use.

- Candida oesophagitis.

  Mainly seen in HIV-infected patients, in which the incidence may be as high as 15 to 20%. Symptoms: swallowing painful and/or difficult; burning pain in the substernal area independent of swallowing; feeling of obstruction in the chest; fever [occasionally].

- Candidal paronychia.

  Infection of the skin at the base of the nail, commonly referred to as a “whitlow” or “felon,” which has the following characteristics: a cushion like thickening of the paronychial tissue, and occasional discharge of thin pus; the lateral borders of the nails become slowly eroded, and there is a gradual thickening and discolouration of the nail plates. [Gray]

  May develop in persons whose hands are subject to continuous wetting, especially with sugar solutions or contact with flour.

- Oropharyngeal candidiasis [thrush].

  General term for oral infection caused by Candida spp. Appears as creamy white, thick, elevated patches of exudate on buccal mucosa, tongue, palate, and/or uvula. Patches leave an erythematous bleeding surface when scraped off. Symptoms: soreness, burning tongue, taste changes, dryness. Incidence higher in neonates, elderly people, and patients with debilitating diseases. Predisposing factors: inhaled steroids; trauma [dentures]; broad-spectrum antibiotics; corticosteroids; immunosuppressive therapy; diabetes mellitus; adrenal dysfunction; hypothyroidism.

- Vulvovaginitis.

  Relatively common during pregnancy [notably in the third trimester] or in diabetes mellitus. Predisposing factors: broad-spectrum antibiotics; oral

contraceptives with high oestrogen content. Appears as a yellow or creamy white, curd like [occasionally thin or watery] vaginal discharge with burning, itching, oedema and erythema between the labia minora, and inflammation of the vaginal wall and vulva. Other possible symptoms are vulvar pain and pain during sexual intercourse.

- Peri-anal candidiasis.
  White macerative pruritus ani.

Types of Invasive Candidiasis

Almost any organ may be involved.

- Candida peritonitis.
  Related to either peritoneal dialysis or to injury to the gut.

- Bone and joint candidiasis: osteomyelitis and/or arthritis.
  Relatively rare. Due either to haematogenous dissemination or direct inoculation due to trauma, surgery, or intra-articular injections. The haematogenous form is more common in infants with invasive candidiasis, due to the more extensive blood supply in growing bones and joints. About one third of babies with Neonatal Candidiasis have joint and/or bone involvement.
  Usually affects large joints, most often the knees [< weight bearing or full extension] and next the hips, ankles, and shoulders. Involved joints are painful or tender; fever is often absent. Infants often also have concomitant metaphyseal osteomyelitis.
  An additional risk group are intravenous drug addicts of brown heroin. Here the costal cartilages are particularly involved.
  Candida albicans is responsible for about three-quarters of cases, whereas Candida parapsilosis is especially linked to arthritis in the setting of a prosthetic joint.

- CNS candidiasis.
  The most frequent clinical manifestation - *meningitis* - has a much higher incidence in neonates than in adults. Symptoms in adults consist of the classic signs of meningitis: fever, headache, stiffness of nape of neck, altered mental status, confusion, and disorientation. Has a similar indolent course as meningeal tuberculosis. Neonates present with sepsis, bulging fontanel, and splitting sutures.

- Urinary candidiasis [including candida cystitis and urethritis].

  Candida spp. present in the urine. More frequent in females due to vaginal colonization. Associated with antibiotic treatment, old age, pregnancy, and the use of urinary catheters. Usually asymptomatic; symptoms such as dysuria and increased frequency and urgency are rare.

- Biliary candidiasis.

  Majority of cases presents as cholecystitis [without presence of calculi] with classic symptoms as right quadrant tenderness, intolerance of oral feeding, nausea, vomiting, and fever.

  Biliary tract obstruction [fungus ball] or candida cholangitis form a small percentage of cases.

- Cardiac candidiasis.

  Endocarditis, myocarditis, and/or pericarditis.

  Predisposing factors for candida endocarditis include open-heart surgery [1% rate], prosthetic valves [4-9%], and intravenous heroin abuse [50-60%]. Candida albicans is the causative agent in the majority of cases in nonaddicts; C. parapsilosis predominates in the group of intravenous drug addicts.

  Symptoms identical to those of bacterial endocarditis: fever; changing murmur; swelling of spleen; congestive heart failure; retinochoroiditis [especially among drug abusers]; petechiae, papules, pustules, nodules, or ulcers.

- Candida pneumonia.

  Symptoms: fever; rapid breathing; dyspnoea; chest pain. Patient “usually severely ill, with multiple organ failure, and some degree of altered mental status.”

- Hepatosplenic candidiasis.

  Affects almost exclusively patients undergoing remission induction chemotherapy or bone marrow transplantation for acute leukemia. Symptoms: persistent fever; right upper quadrant tenderness; enlargement of liver; abdominal distension; nausea, vomiting; diarrhoea.

- Pancreatic candidiasis.

  Symptoms are non-specific: abdominal pain and persistent fever.

- Candida septicaemia [candidaemia].

  Clinical manifestations range from fever to life-threatening sepsis. Candida albicans is the prevalent cause in adults, Candida parapsilosis in infants and especially neonates.

  Predisposing factors include intravenous catheters, use of antibacterial drugs, urinary catheters, surgical procedures, corticosteroid therapy, neutropenia, severe burns, parental nutrition, and chemotherapy induced impairment of oropharyngeal or gastrointestinal mucosa. A characteristic presentation is antibiotic resistant fevers in the neutropenic patient with tachycardia and dyspnoea. Hypotension is also common and skin lesions may also occur.

[Data: website DoctorFungus].

THRUSH

- Candida spp., most frequently Candida albicans, are part of the normal mouth flora in 25-50% of healthy individuals, influenced by such factors as salivary flow, salivary pH, and glucose concentration.

The notion that thrush, and other mycoses, are affected or even caused by constitutional factors is one of long standing. The French physician Trousseau [1801-1867], for example, thought it "equally a matter of certainty that for the development of the mycelium, special conditions are requisite: there must be pre-existing inflammation of the mucous membrane on which it is seated." Trousseau treated thrush with borax or potassium chlorate and honey. In Sweden, thrush lichen or lichen moss *[Peltigera aphthosa}* boiled in milk was a folk cure for thrush. [Ainsworth]

- Thrush is observed in patients with diabetes mellitus and debilitating diseases such as cancer or tuberculosis. Oral contraceptives and a deficiency of riboflavin [vitamin B2] also predispose to this overwhelming growth of *C. albicans.* [Kern]

- Raue, writing in 1896, gives an excellent description of thrush and some factors that favour its appearance:

Parasitic Stomatitis; Thrush.

This affection is produced by a parasitic fungus, the *oidium albicans,* and is characterized by the formation of numerous, milk-white patches or

elevations which are difficult to remove. They are not the result of an exudative inflammation, but due to the extensive development of the above named fungus within the mucous membrane.

We may frequently foretell its coming, when we observe that the mouth of the infant is getting dry, hot, red and sticky and its secretion gives an *acid reaction.* Then after a few hours white points of the size of a pin's head appear mostly at first on the inner surface of the cheeks, quickly spreading over various other places and soon covering in some cases the entire buccal cavity, and even the pharynx and oesophagus with a white membrane. After a while its white colour turns yellowish or brown if bleeding occurs from rough handling. The first few days this membrane adheres firmly to the mucous membrane; later, on about the third or fourth day, it becomes loose and can easily be wiped away. [Candida colonies mature in three days.]

During the continuance of this fungous growth the mouth of the nursling is hot, has an acid reaction and is sensitive to touch in a degree that even nursing sometimes is painful to the child. But as long as the affection is not complicated with intestinal catarrh, its course is quite mild and short, and passes away in a few days if proper attention is paid to cleanliness.

It is different with artificially fed children when an intestinal catarrh is superadded to the trouble. Under it the child may sink with signs of follicular enteritis.

Causes.

The formation of this fungus is favoured by acid fermentation. The secretion of the mouth is a mixture of saliva and mucus. The saliva is of alkaline reaction, more so after a meal, less so on an empty stomach. The buccal mucus, however, has an acid reaction, which is visibly increased on contact with atmospheric air, when acid fermentation at once begins. In young infants the secretion of mucus is in preponderance over the secretion of saliva; there is therefore a physiological tendency to acidity in a young child, and if, in addition to it, the child is nourished artificially and improperly by substances which easily undergo acid fermentation [suckingbags, poor milk from badly cleansed bottles, etc.] an outbreak of thrush is sure to follow.

We find, therefore, that thrush attacks more frequently children artificially fed than those who suck their mothers' breast, and for this additional reason that the latter in sucking draw the saliva out of their salivary glands, while the easy flow from the bottle requires nothing but swallowing. I would rather have the baby fed by the spoon, as in this way chewing motions are

induced and a more thorough mixture of the food with saliva is ensured. We find thrush also in *adults,* but it is of rare occurrence, and then always in consequence of protracted and exhausting diseases, such as phthisis, diabetes, cancer, etc. - setting in shortly before death.

[Raue, Special Pathology and Diagnostics with Therapeutic Hints; 1896]

CANDIDA HYPERSENSITIVITY SYNDROME

• After the American paediatrician William Crook published in 1986 his book *The Yeast Connection,* in which he postulated that the overgrowth of Candida causes a host of symptoms which he coined the "Candida Hypersensitivity Syndrome," the American Academy of Allergy and Immunology was quick to condemn Crook's concept as "speculative and unproven." Medical establishment denounced the whole idea as being based on historical controls and lacking in rigorous data to support it.

> Since the mid-1980s, several physicians have reported that while treating female patients for candidiasis, they seem to have inadvertently - at first - relieved symptoms of other problems. These include premenstrual syndrome, sexual dysfunction - ranging from nymphomania to loss of libido - and depression. They hypothesize that the cause and effect are not just coincidental but that, in fact, some traditionally psychological disorders may be the consequences of above normal populations of *C. albicans.*
>
> Dr. WG. Crook, author of *The Yeast Connection* and one of the pioneers in this area of medical investigation, suggests several possible mechanisms for the unexpected effects of the yeast. They include toxin production by *C. albicans,* yeast-induced nutrient imbalance, and ethyl alcohol fermentation. Critics of Crook's work argue that evidence to support his contentions is wanting. In fact, clinical trials comparing reactions of patients treated with or without the antifungal drug nystatin showed no differences in the test populations. Nonetheless, the debate continues with a small but vocal cadre of medical professionals convinced that *C. albicans* is responsible for much more disease than it gets credit for.
>
> [Hudler 1998]

• With the public media, health writers and health magazines jumping on the bandwagon, the syndrome, however, soon grew into a "Candida-Related Complex" of truly miasmatic proportions. Some authors even speak of a

"hidden epidemic" that, fuelled "by everything from diet to medication to environmental factors," affects "as many as 90% of Americans and Canadians." Candidiasis has become a fashionable diagnosis, culturally defined and anything but individual, consistent with Dr. Crook's conclusion that "your health problems are probably yeast [Candida] connected if you crave sweets, feel sick all over, have taken many antibiotics, and have seen many physicians and have not found help."

• Many complaints and chronic health problems are, according to Crook, related to Candida albicans, ranging from "fatigue, headache and depression in adults to ear problems, hyperactivity, attention deficits and autism in children," and include, in addition, "PMS, sexual dysfunction, asthma, psoriasis, digestive and urinary problems, multiple sclerosis, and muscle pain." In 1985 Dr. Crook founded the International Health Foundation devoted to helping people with yeast related problems.

SYMPTOMS

Symptoms of Candida proliferation are vast and broad ranging, some of the most common are:

- Brain fog [memory deficits and/or concentration problems].
- Anxiety; depression; irritability.
- Frequent mood swings.
- Obsessive compulsive disorder.
- Fatigue. Feeling of being drained.
- Environmental sensitivities; food sensitivities.
- Sugar craving. Hypoglycaemia [trembling or irritability when hungry],
- Digestive problems including heartburn, bloating, gas, diarrhoea or constipation.
- Menstrual problems; severe premenstrual tension and/or menstrual irregularities.
- Chronic vaginal yeast infections, with burning, itching and curd like discharge.
- Oral or vaginal thrush.
- Cystitis.
- Frequent colds; cold sores; herpes.
- Swollen lips/ face.

- Respiratory allergies; rhinitis, sneezing and/or wheezing.
- Muscle weakness or paralysis.
- Pain and/or swelling in joints.
- Restless legs.
- Cold hands and feet; low body temperature.
- Fungal skin problems; athlete's foot; fungus nails.
- Chronic urticaria.
- Foot, hair, or body odour not relieved by washing.
- Symptoms worse after waking.

ALLERGIES

"Candida, albicans can evoke allergic reactions in a human organism, which otherwise is in a normal condition," according to the Israeli physician A. Liebeskind. He treated successfully 25 patients with various allergic disorders - migraine, vulvitis, chronic blepharoconjunctivitis, bronchial asthma, rhinitis, and gastrointestinal problems - with hyposensitization injections of an extract of *C. albicans.*

Related to its principal action as a histamine-releasing agent, the hypersensitivity response to Candida toxins takes place in the form of allergies. The allergic reactions mainly occur in the eyes, the upper respiratory tract, the gastrointestinal tract, and on the skin.

The dermatologic symptoms are as follows:

- Hives; urticaria.
- Atopic dermatitis; eczema.
- Erythema multiforme.
- Pallor.
- Contact dermatitis/ eczema.
- Dermatophytid. [ID-reaction; *see* Trichophyton.]
- Allergic eczema.
- Seborrhoeic dermatitis [dandruff].
- Infectious eczematous dermatitis [skin infection].
- Nummular dermatitis.
- Neurodermatitis.
- Psoriasis.

[J.P. Trowbridge & M. Walker, *The Yeast Syndrome;* New York, 1986]

PSYCHOLOGICAL PROFILE

Luc De Schepper, M.D., presents in his book *Candida* a "psychological profile of the Candida patient." It is not based on clinical cases treated homeopathi- cally, but on general observations concerning patients with candidiasis, in a similar vein to the way in which currently, 'miasms' such as Malaria, Ringworm, or Cancer are built up. The following is a summarized outline.

> Feelings of frustration, being misunderstood and rejected seem part of our life experience. To a Candida patient, these feelings are often magnified; life seldom seems to treat the Candida patient fairly.
>
> In the early childhood experience of the Candida patient, abuse often has been present. The experience of sexual, emotional, or physical abuse are indications of a traumatic childhood, in which emotional nourishment, encouragement in goal-setting, or simply the coherence of a healthily functioning family are absent.
>
> This fear-inducing environment influences one's immune system in a weakening manner, leaving one susceptible for invasion of diseases. Ancient medical practices, such as Acupuncture and Homeopathy, have indicated the relationship between physical illness and emotions. According to the philosophy of Acupuncture, each emotion is linked to a certain organ. Fear, for instance, will decrease the energy in the Kidney organ; worry and pensiveness will do the same in the Spleen. ... What makes it even worse, deficiency of energy in the Kidney organ leads to more fear and anxiety, pulling the patient in a vicious circle.
>
> ... What follows next is the common nightmare of the Candida patient. As a child, most of these patients are subjected to an increased antibiotic intake and our modern diet with preservatives and sugars. Most of the symptoms will appear a couple of years later, but sometimes immediate yeast-related signs surface: mood swings, depression or suicidal tendencies. The sudden mood swings are the most startling symptoms. Patients look and act joyful at 10 a.m. and are threatening to kill themselves by 2 p.m. We can understand the scepticism and disbelief of professionals and family; nobody, not even the patient, expects these sudden variations. In the end, the patient is convinced that s/he has become crazy: it is the only possible answer to this yo-yo behaviour.
>
> You know where the real problem of the Candida patient starts? Most of these victims, especially in the beginning stages, look too healthy, too

handsome ... In fact, they look too good to have any kind of disease! This is the Catch-22: outwardly, it does not look like a disease. And, for the textbook physician, looking for objective signs, he hardly finds them. How can you see “fogginess” in the brain, burning urination, severe PMS symptoms, decreased attention span ... At most, the patient looks depressed. The emotion though, that predominates this disease, is ANGER! All Candida patients have a reservoir of anger, mostly deeply hidden. There is a need to understand the origin of anger and to seek means of dealing with the factors involved. Do not believe that this anger will always show in violent behaviour. There are other levels of manifestation of anger: ulcerative colitis, hypertension, eczema, migraine attacks, depressions, and suicidal tendencies can be expressions of this emotion. Most patients will not even admit that they are angry. However, a lot of expressions imply underlying anger. “I am bitter the way my doctor treats me” or “I am fed up the way my husband denies this problem,” “It irritates me, I cannot get any explanation from anyone” are only anger in disguise.

... Patients who find no place to put their anger, are ridden by guilt, which offers no relief.

... Another manifestation of hidden anger in almost every Candida patient is in the bodily reactions. An almost constant symptom in these patients is the pain in the neck and shoulder region. We know the expression, “You are a pain in the neck,” these patients actually have pain in the neck because they ARE angry and they refuse to accept it or are not allowed to bring the anger outward.

Of course, this chronic disease solicits anger as well from the patient as from the rest of the family, especially the partner. The patient may build up the anger for all kinds of reasons. They feel constantly rejected, are always questioned and doubted about the existence of this disease, and simply because they are outside the mainstream and do not get their share of the world’s excitement and rewards. The partner resents this disease immensely because it makes him a prisoner in his own house, without having the disease. They are inconvenienced by their partner’s illness, leading to feelings of frustration and resentment.

[Luc De Schepper, *Candida,* revised edition; Santa Fe: Full of Life Publishing, 1990]

DIE-OFF REACTIONS

• It will require careful and accurate homeopathic prescribing of Candida albicans to establish a made-to-measure drug picture that goes beyond the universal character of candidiasis. The symptoms associated with the latter might apply to almost all individuals at some time. We can draw parallels with a remedy like Carcinosin.

• To narrow down the abundant symptomatology to its possible essence it might help to consider a phenomenon that occurs during the first days or, rarely, weeks of the treatment of candidiasis with antifungal antibiotics. The phenomenon is termed “die-off” or Herxheimers reaction and is mainly observed with the use of nystatin and, to a lesser degree, with other antifun- gals or with natural treatment. [Herxheimers reaction is not uncommon in the treatment of spirochete infections - syphilis, Lyme disease - and with antibiotics in general.]
Nystatin was isolated in 1950 from bacteria of the genus Streptomyces, which, like other soil bacteria, are the natural adversaries of microscopic fungi. Nystatin destroys the cell wall of Candida, with the result that the contents leak out and the cell “bleeds to death.” With the leaking of protoplasm and electrolytes, a number of toxins also escape, the sudden release of which produces a temporary toxic or allergy-like reaction in the host. This is not an adverse reaction to the nystatin itself since it clears up as the nystatin is continued.
The die-off reaction resembles the initial aggravation induced by homeopathic remedies. Both are, in fact, temporary intoxications, energy-wise or physically, and both evoke body responses to turn the economy into order. Kent compares the initial aggravation with “a process of house cleaning,” a process of elimination, “probably from the bowels, or stomach, by vomiting, by expectoration, or by the kidneys, in those cases where everything has been suppressed.” Die-off reaction includes elimination processes as well as symptoms caused by the release of Candida toxins. If Candida treatment requires reducing or avoiding coffee, alcohol, chocolate, dairy products, sugar, wheat, and yeast-fermented foodstuffs, part of the die-off reaction may be due to withdrawal symptoms.
The following is an overview of common die-off reactions, accompanied by some of the comments by the authors of the listing.

Allergy reactions.

"These often may increase during Candida treatment or if you never had allergies or food sensitivities before, they may temporarily crop up during this time."

Anger and aggression.

"Anger and aggression can be common during treatment. Tolerance levels seem lower. One reason may be that *the yeast is agitated;* it in turn agitates you, and you pass it on. During treatment, quick anger is generally a body response - not a real emotion." [My italics]

Bloating.

"This is common during Candida treatment and cleansing."

Blood sugar problems.

"If you already have low blood sugar or diabetes, these may become more problematic during Candida treatment. If you don't, you may still experience more dramatic blood sugar swings due to the extra stress of treatment."

Bruise easily.

"Usually only very sensitive people have problems with this."

Colds. Sore throat.

"When body defences are lower [as during Candida treatment], you may be more susceptible to colds."

Cold extremities.

Crying.

"This may occur more frequently because of the stress of treatment. It's okay! Realize you will be more sensitive during this time and allow yourself a little harmless release, provided it is not excessive. Many toxins are released in tears, so this may assist cleansing. Get sufficient rest and get support from family and friends."

Constipation.

Depression.

"Ease up on self-demands and reduce workload or, if not busy enough, get busy with work, arts and crafts, a garden, or better yet - cook!"

Diarrhoea.

Energy lows.

Emotional experiences.

"It is natural to revive or relive emotional experiences during treatment, especially experiences that reflect the same energy levels that you have during cleansing. Do not be surprised if old loves, old hurts, and old feelings resurface. Spend time releasing, forgiving, and letting go. Do not wallow in the past or get depressed about it. See this cleansing time as a time of renewal and recharging, a 'cocoon time' in preparation for your emergence as a 'healthy butterfly'."

Headaches.

Hyperactivity.

"During treatment, this may occur when overworking or overplaying is done. ... Not enough food or too high a Candida treatment dosage can lead to hyperactivity, too. ... Parasites can contribute to this, as they are greatly agitated during treatment."

Indigestion.

Lack of coordination.

"May occur more often during treatment."

Mental confusion, spacey.

Mucus.

"The body expels mucus as parasites die."

Paranoia.

"Temporary mental problems and confusion can be caused by parasite treatment. The poisons being eliminated can flood the body and brain and may contribute to creating delusional thoughts and emotions."

Skin problems.

Skin irritations or rash. “Temporary food intolerances may become evident during Candida treatment. One could become agitated by dairy foods, tomatoes, meats, nuts, or many other foods you are not normally allergic to.”

Sleeplessness.

[Jeanne Marie Martin & Zokan P. Rona, *Complete Candida Yeast Guidebook,* revised 2nd ed.; Roseville, 2000]

MATERIA MEDICA

Proving

[1] Marco Riefer, Germany, 1994; 30c and 200c; 19 provers [12 females, 7 males], of which 2 provers produced no symptoms whatsoever.

KEY COMPONENTS

<== Anger, expressed or suppressed.

The phenomenon of suppression is very evident in Candida albicans, first of all in the form of suppressed anger. During the provings, rage was experienced directly and immediately. However, in practice I usually saw conditions of suppressed anger, of anger that was not allowed. In many cases the anger could not be kept down and was therefore permanendy looking for an outlet.

‘Wut im Bauch haben is a common idiom in the German language, which could be translated as ‘having anger in my belly. This expression fits very well with the central physical symptoms concerning the digestive system [flatulence, fullness, diarrhoea and cramping pains]. It has been confirmed in this proving, as well as in others, that mental and physical symptoms form a corresponding unit and the disease is reflected on different levels. The aggression itself can be completely hidden, but can also be very violent, almost driving the patient mad. There may be an impulse to destroy everything, simply smash everything to pieces. A typical expression of one of the provers is: T feel such tremendous aggression in me that I can hardly handle it. I have to muster all my strength not to destroy something.’

=» Fatigue.

Another striking symptom is the tremendous lack of energy in this remedy. [Is this a result of the suppressed anger?] Tiredness up to severe exhaustion widely occurred in the whole proving and in many of the treated cases.

= Craving for sweets.

We could understand the gready increased desire for sweets, certainly a high degree symptom, as an attempt to make up for the lack of energy. [This craving is also common to the mycosis-patient.]

= Overwhelmed.

To me the Candida albicans patient seems to be a typical 'product' of modern western society, which is characterized by the following features: Too many demands made upon a person by a tough, efficiency-oriented society which is too complex for the individual to grasp and which he experiences as threatening.

A multitude of daily impressions to which he is exposed, almost overwhelming the individual.

A hectic state, tension, stress and a daily feeling of'too much.'

Ignored emotions and an outward presentation of a smooth and clean surface.

~ Too many ...

Too many requirements, expectations, impressions [odours, noises, ...]. Too much to do and no way out ...

The basic sensation of 'too much' is a feeling of inability to cope, of being overburdened, a feeling of not being able to fulfil the demands of everyday life and sometimes even of the whole life. [A typical phrase from the proving is: 'Even the little demands of everyday life are too much for me.'] Candida albicans patients feel overwhelmed by daily routines, requirements and duties. A feeling of restriction develops and takes over, and they cannot get rid of it.

= Restless and hectic.

The reaction [to the inability to cope] is that they feel restless and hectic. Candida albicans is a particularly restless remedy, ceaselessly in action [or more precisely, the feeling of being ceaselessly in action], always having something to do, no time to relax. They quickly get into a state of stress

and tension. Examples in the provings are: 'I cannot get anything done. This is the most stressful week. Dates, driving. Everything is too much.' And: 'Towards the evening everything is too much; a feeling of being hurried and rushed. A strong desire for rest and being alone.'

= Chaos.

Forgetfulness, lack of concentration and in some cases real confusion are very striking, in combination with the other symptoms. Chaotic conditions are a central manifestation of Candida albicans. We see these symptoms in many remedies, but in Candida albicans they are the prominent and significant symptoms of the remedy. Characteristically one prover wrote: 'I was very confused and had to think about normal procedures before carrying them out. I had forgotten what I had planned to buy in the supermarket and once in the car park I had to think where I was, where I wanted to go and how to get there.'

~ Background.

In order to answer the question of 'what is the cause of this kind of manifestations, why is this anger not allowed to be expressed, why are these people so confused,' etc., we should look at a number of cured Candida albicans cases. These people have been inhibited, often hindered and suppressed in expressing their free will and this suppression had become the central theme of their lives. [DD: Carcinosin]

We talk about dominated people who were not allowed to develop their own personality. In some way we could say we are dealing with parasitic relationships.

We observe exploitative relationships, with the Candida albicans patient being the victim, being used or abused, in which the equilibrium of giving and taking has been shifted.

The tendency towards exploitative relationships often continues and is repeated again and again according to a fixed pattern.

Candida patients usually react helplessly and defencelessly in this kind of situation, showing vagueness and indirect and ineffectual aggression.

They are unable to be clear and precise and cannot set limits. In some cases the patient repeatedly became the involuntary supporter of a partner or a parent; the used, abused or energetically sucked out 'victim.'

= Dreams.

The most important themes in the dreams: Blood. Brutality, murder. Bombs. Explosion. Hell. Rape.

[All quotes from Marco Riefer, Candida albicans: A proving report and a case; Homoeopathic Links 2/98.]

Appetite & Digestion

= Constant hunger. Cant stop eating; fasting impossible. Overeating; stuffing oneself.
= Craving for sweets 12 proves].
= Constant sensation of fullness and satiation.
— Desire for high-calorie foods, < in evening; i.e. chocolate, cold milk, remoulade [see recipe section p. 760!], crisps, pizza.
= Weight gain. [Prover gained 4.5 kg in 11 days.]
» Gnawing pain in stomach, as from an ulcer, > eating.
= Lump sensation in stomach, pressing upwards.
“ Watery diarrhoea, smelling like rotten eggs.
» Constipation with sensation of fullness in rectum and flatulence.
= Pressing frontal headache > stool.

Peculiars

= Painful swelling of axillary lymph glands.
= Offensive axillary perspiration.
«■ Sensation of emptiness in chest and abdomen.
= Tickling in chest > swallowing.
~ Palpitations before falling asleep, > hand on chest.
= Painful stiffness in hollow of feet in morning on rising.
= Buzzing sensation in arms, legs, and down the back.

CLINICAL SYMPTOMS

In the booklet with the proving results, Riefer describes seventeen cured cases, both constitutional and acute, of which the following symptoms are included in the Repertory section.

[The number behind the symptom indicates the degree. First degree (1): observed only once. Second degree (2): observed two to four times. Third degree (3): observed more than four times.]

Delusion/ sensation
<·> Alone in the world [i],
« About to sink into annihilation [1],
« Defenceless [i],
= Despised [1].
« Eaten up; consumed [1].
«· Internal emptiness [1],
= Surrounded by enemies [1],
~ Floating in air [i].
= Forsaken [1].
= Helpless [1].
= Persecuted [i],
<= Powerless [i],
<=> Prisoner; caught; imprisoned [2].
= Separated from the world [i].
= Stupid [i],
= Thin [i].
= Time passes too quickly [i].
= Unloved by parents, partner, friends [i],
= Has done wrong [2].

Anxiety/ Fear
= Business failure; bankruptcy [1],
— Impending disease [i].
= Something will happen [i],
« Health: own health [i]; health of relatives [i].
■> Money matters; poverty [i],
= Punishment [i],
■» Robbers; thieves [1].

Concomitants
« Headache & empty sensation in head [i].
= Headache & sensitivity to strong odours [i].
= Coryza & itching of eyes and lachrymation [i].
<» Throat pain & nausea [i],
= Stomach pain & vertigo [i].

Food

<■ Apples < [i].
= Farinaceous < [ij.
= Fish < [i].
= Milk < [i].
■» Sweets < [2],

Desires chocolate [i]; cold drinks [1]; cold milk [i]; salt [2]; sweets [3J.

Modalities

» Headache < coughing [ij; exertion [1]; light [2]; before menses [1]; noise [1]; stooping [ij; change of weather [i],
= Clenching teeth firmly together at night [1].
■» Burning pain in oesophagus < concentration [mind] [1].
= Itching external throat < scratching [i],
=» Heartburn after eating or drinking [ij.
= Abdominal cramps, & heat, at night [ij.
== Sensation of rectal constriction after stool [1].
<· Difficult respiration < lying; > sitting [ij.
= Constriction chest > weeping [1].
«· Profuse perspiration at night [ij.
<=> Itching at night [2]; < scratching [2].

[Marco Riefer, Das Arzneimittelbild von Candida albicans, 2. Aufl.; Freiburg, 1996]

Rapidly growing dimorphic fungus, changing from yeast-like to filamentous.
Part of the normal flora in the throat, vulvovaginal area, lower intestinal tract, and skin.
Feeds on sugars and other simple carbohydrates.
Causative agent of candidiasis.

Brain fog.
Spaciness.
Mood swings.
Anger and aggression.
Victim, persecuted, despised.
Alone, helpless, unloved
Restless, hectic, chaotic.
Depressed.
Fatigued, tired, exhausted.

Sugar craving.
Hypoglycaemia.
Digestive problems.
Carbohydrate binges

Allergies.
Palpitations.
Headaches
Perspiration.
Swollen glands.
Fullness/Emptiness

CANDIDA KEFYR

Scientific name Candida kefyr (Beijerinck) van Uden & Buckley 1983.
Synonyms Saccharomyces kefyr Beijerinck 1889.
Candida pseudotropicalis (Castell.) Basgal 1931.
Candida pseudotropicalis var. lactosa (EC. Harrison) Diddens & Lodder.
Teleomorph Kluyveromyces marxianus (E.C. Hansen) van der Walt.
Family Ascoideaceae.

See Kluyveromyces marxianus.

CANDIDA PARAPSILOSIS **Cand-p.**

Scientific name Candida parapsilosis (Ashford) Langeron &Talice 1932.
Synonym Monilia parapsilosis Ashford 1928.
Family Ascoideaceae.

NOTE: Included in the repertory under the abbreviation *Cand.*

KEYS

- Spider-like with satellite fingers extending outward.
- Abuse of azole antifungal agents.
- Scatter-brained. Spaciness.
- Explosive anger.
- Craving for salt.
- Burning pains/ sensations.
- Itching.

FEATURES

- Forms creamy colonies; sometimes with lacy appearance.
- Periphery of colony turns brown in 3 to 4 weeks.
- Characteristic “shaggy star” appearance or “spider-like with satellite ‘fingers’ extending outward.”

CLINICAL FEATURES

• Heavy and prolonged treatment with azole antifungal agents selectively shifts the balance between the various Candida species in favour of such species as C. parapsilosis, which are resistant to these antifungals. Hence, Candida parapsilosis is isolated with *increasing frequency.*
• Relatively frequent cause of candida endocarditis, in particular among intravenous drug addicts [heroin].
• In joint candidiasis linked to arthritis in the setting of a prosthetic joint.
• Most prevalent cause of neonatal candidiasis.

The classic clinical picture of systemic candidiasis in neonates is indistinguishable from bacterial sepsis and may include all of the following symptoms: temperature instability; hypotension; respiratory dysfunction and apnoea; abdominal distension; carbohydrate intolerance.

> Candida parapsilosis is a common yeast-like organism that has been implicated in human infection. It has been recovered from respiratory secretions, urine, gastric washings, blood, vagina, oropharynx, skin, transtracheal aspiration, stool, pleural fluid, ear, and nails. It is implicated in the following human infections: Endophthalmitis, endocarditis, vaginitis, mycotic keratitis, external otomycosis, paronychia, and fungemia. In the vagina, it is found less frequently than Candida albicans and Torulopsis [Candida] glabrata and is only rarely associated with vulvovaginal candidiasis as it is a less adherent organism.
> [Donald Brown & Andrew Lange; Homoeopathic Links 1/92]

MATERIA MEDICA

Proving

[1] Donald Brown and Andrew Lange, 1989; 12x and 30x; 16 provers [9 females, 7 males].

SYMPTOMS

Mind

= Very tired and scatter-brained.
~ Total “loss of mind”: seeing red lights and thinking they were green, [cf.

Borrelia, Ozone.]
= Mind races and words come out in wrong order or mispronounced.
= Spacey and poor concentration. Concentration difficult [several provers].
= Extremely anxious.
« More easily aggravated and frustrated.
= Explosive anger at minor incidents - as though their rights were being infringed upon.
= Forgetful.
= Unusually irritable.

Appetite & Thirst
= Appetite increased [3] or decreased [1].
<·> Great thirst.
=> Craving for salt [2].
=» Craving for pickles and garlic.

Modalities
= Dizziness and hot flushes > open air.
= Itching in pubic hair > bathing.
= Itching all over > scratching [temporary relief].
= Painful sensation of constriction in forehead < direct sunlight.

Pains
= Aching in forehead.
«· "Banging" sensation in head - wakes with a headache.
<=> Lower left quadrant abdominal pain - cramps.

Sensations
= Swollen feeling around face - sensation of fine vibration.
= Sensation of arrhythmias with light-headed feeling.

Burning
= Burning pain in eyes - wakes at 1 a.m. with burning eyes.
« Burning and tingling of lower lip.
= Burning and tingling of mouth and lower lip with a hot feeling down the oesophagus into the stomach.
= Wakes at 1 a.m. with burning throat [and thirst].

« Recurring, burning spot on medial border of left scapula - feels as if stung by a scorpion.

Gastrointestinal
= Abdominal cramps four to five hours after lunch.
= Gas and bloating, & heartburn, after eating.
«= Fullness in stomach two hours after eating - persistent [duration of 7 days].
= Constipation [2] or stools green and acidic.

Female
«· Fertile mucus for the entire active proving [7 days] when 1-2 days is normal.
=> Menses eight days late.
« Egg-white leucorrhoea - dripping discharge.
« Decreased sexual desire.
— Worst premenstrual breast-tenderness ever.

Skin & Itching
= Itching of outer edges of scalp.
« Eczema-like patches on hairline - red, scaly and itching.
— Tiny white pimples with dry skin [face].
= Forearms very itchy and slightly red on volar surface - worse with a wool shirt on.
= Two, small vesicles on right arm under watch - very red and itchy.
= Itching in pubic hair - red and sore - > bathing.
>» Vaginal itching.
«· Pimple-like sore on buttocks - pink and raised and sore to touch.
=■ Itchy heel - pruritus.
= Itching all over as if a bug or other irritant were on skin; scratching skin > temporarily.

Locals
= Obstructed nose [3 provers].
— Intense smelling urine. Colour very dark yellow.
·» Prominent, quick heartbeat that reverberates through the chest.
— Violent heart flutter for five seconds which caused immobilizing fear - occurred while lying on left side.

I B. FAMILY SACCHAROMYCEDACEAE

KLOECKERA APICULATA **Kloeck-a. [Sacmy-a.]**

Scientific name	Kloeckera apiculata (Reess) Janke 1923.
Synonyms	Saccharomyces apiculatus Reess 1870. Kloeckera brevis Lodder 1934.
Teleomorph	Hanseniaspora uvarum (Niehaus) Shehata, Mark & Phaff1984.
Family	Saccharomycodaceae.

NOTE: Listed in the repertory as Saccharomyces apiculata, abbreviation: *Sacmy-a.*

KEYS

- Yeast. Wild yeast.
- Fermentation starter.
- Dies at ethanol levels of 4% to 5%.
- Fruity flavour.
- Destroyed by sulphur dioxide.
- Can break down proteins.

FEATURES

- Yeast species occurring naturally in the soil, on fruits, and on fruit-flies of the genus Drosophila [which breed in fermenting fruit juices].
- *Wild* non-Saccharomyces yeast while Saccharomyces cerevisiae is known as "one of the oldest *domesticated* organisms."
- One of the species that starts fermentation in beer and wine making ["spontaneous fermentation"], setting the stage for Saccharomyces cerevisiae.
- Predominant until ethanol levels reach around 4% to 5%. At these ethanol levels this species dies leaving only Saccharomyces cerevisiae to continue and

Scientific name	Kluyveromyces marxianus (E.C. Hansen) van der Walt.
Synonyms	Kluyveromyces fragilis (A. Jorg.) Van der Walt 1965.
	Kluyveromyces bulgaricus (Santa Maria) Van der Walt 1971.
Anamorph	Candida kefyr.
Family	Saccharomycetaceae.

I.C. FAMILY SACCHAROMYCETACEAE

Kluyveromyces marxianus

Saccharomyces carlsbergensis [Cerevisia lager]

Saccharomyces cerevisiae [Torula]

Alcoholus

Yeast. Wild yeast. Fermentation starter. Dies at ethanol levels of 4% to 5%.

Kluyv-ma.

Fruity flavour. Destroyed by sulphur dioxide. Can break down proteins.

KLUYVERO MYCES MARXIANU S

KEYS

- Yeast.
- Dairy products.
- Produces lactase. Lactose intolerance.
- Kefir.

FEATURES

- Yeast usually encountered in cheese and other dairy products.
- Causes spoilage of cheese.
- May be found on souring figs and rotting grapes.
- Produces ethanol.
- Occasionally implicated in human infections such as oesophagitis and vaginitis.
- Polymorphism within the species is very high, and numerous synonyms thus exist.

completethe fermentation.
• Beneficial to the fruity flavour of certain wines and ciders, the so-called 'Apiculatus-tone,' but may also be very damaging, that is, producing much acetic acid.
• If sulphur dioxide is added to the initial juice [cider], must [wine] or wort [beer], non-Saccharomyces yeasts and most bacteria are suppressed or killed.
• Can break down proteins, in contrast with Saccharomyces cerevisiae.
• Mainly assimilates glucose.

• Candida kefyr, the asexual state of K. marxianus, is one of the four most frequently isolated species of Candida. Urinary tract infections, endocarditis, mycotic keratitis, and onychomycosis caused by *C. kefyr* have occasionally been reported in debilitated or immunocompromised hosts. [Fisher]

LACTOSE - LACTASE

• Until the 1930s it was the general belief that only certain bacteria, particularly those of the genus *Lactobacillus,* are capable of converting certain carbohydrates, especially lactose, into lactic acid. Later research, however, has demonstrated that several microscopic fungi produce lactase, an enzyme that acts on lactose. Some of these fungi are yeasts belonging to the genus Kluyveromyces.
Kluyveromyces [formerly Saccharomyces] lactis is isolated from cheese and dairy products. It ferments lactose and is used to convert dairy products to lactose-free forms. In addition, genetically modified strains [by introduction of the bovine prochymosin B gene into the yeast] are employed to produce chymosin [rennet or rennin] for the coagulation of milk in the manufacture of regular as well as vegetarian cheeses.
Kluyveromyces marxianus is used in the ethanol and yeast biomass [fodder yeast] production of whey. [Whey, a by-product of cheese manufacture, is the watery part of milk and contains 5% to 15% concentrations of lactose].

• Milk treated with lactase [produced by Kluyveromyces] is used for the production of sweet yoghurts with a prolonged shelf life and fewer calories than normal yoghurts.

LACTOSE INTOLERANCE

• Lactose intolerance, or lactase deficiency, refers to the inability to assimilate milk sugar. A clear history of milk intolerance may be obtained in such cases. For people who don't want to go on a lactose-free diet or avoid milk products, a commercially prepared lactase ["yeast enzyme preparation"] is available. The lactase is isolated from Kluyveromyces lactis or K. marxianus var. lactis. Added to milk at 4° C [15 drops per litre], the enzyme splits up to 99% of the lactose into glucose and galactose in 24 hours. Without addition to the milk, the pepsin in the stomach would destroy the enzyme.

> Unsplit disaccharides [e.g. lactose] remain in the lumen and osmotically retain fluid, causing diarrhoea. Bacterial fermentation of sugar in the colon leads to gaseous, acidic stools. ... *Lactase deficiency* occurs *normally* in about 75% of adults in all ethnic groups except those of northwest European origin, in whom the incidence is lower than 20%. Although statistics are unreliable, most nonwhites of North America gradually become lactase-deficient between ages 10 and 20 yr. It affects 90% of Orientals and 75% of American blacks and Indians, with a high incidence among peoples from the Mediterranean area. ...
>
> Symptoms in children include diarrhoea and failure to gain weight. Adults may have borborygmi, bloating, flatus, nausea, diarrhoea, and abdominal cramp. Even when only lactose absorption is directly impaired by deficiency of the enzyme lactase, the resulting diarrhoea may be severe enough to purge other nutrients before they can be absorbed. ...
>
> The diagnosis may be suspected if acidic stools [pH below 6] are passed. The *lactose tolerance test* is specific for the clinical disorder of lactose intolerance. An oral dose of 50 gram of lactose cause diarrhoea with abdominal bloating and discomfort within 20 to 30 min., and there is a low or flat blood glucose curve.
>
> [The Merck Manual. 16th ed.]

• The connection between sugars and Candida is well established. Candida spp. are notorious for their inherent variability and dissociative potentialities. But one way to differentiate them is according to their abilities to ferment [assimilate] a range of sugars. Kluyveromyces marxianus, specialised in the digestion of lactose, has interestingly its anamorph, Candida kefyr, in a closely related family comprising the genus Candida. Candida albicans is best known in connection with oral candidiasis [thrush], commonly occurring in newborns and young children when the normal flora of lactobacilli doesn't develop sufficiently.

KEFIR

• A variety of yeasts are found in kefir including Kluyveromyces lactis, K. marxianus, K. marxianus var. bulgaricus, and their teleomorph Candida kefyr [syn. C. pseudotropicalis]. The yeasts convert the lactose to ethanol and carbon dioxide during the cooler ripening process.
Some of the B group vitamins, particularly folic acid, will increase as the

kefir is left to ripen for a few days. “Ripened kefir is extra good for pregnant women.”

• Kefir is a fermented milk drink with a plethora of reputed health benefits, ranging from improved well-being to increased longevity. The word kefir is thought to have originated from *keif,* Turkish for “feeling good” due to the sense of well-being experienced after ingesting kefir or marijuana.

• There are two types of kefir: water kefir - small transparent grains that ferment sweetened water; and milk kefir - white or cream coloured grains that look rather like cauliflower florets that ferment milk.
The soft, white, gelatinous grains [mother-culture] or cauliflower-like structures [called “yoghurt plants” in Holland] are formed by a symbiosis of lactic acid bacteria and yeasts while fermenting the milk or sweetened water in an endlessly self-propagating process.

• Alternate English names for milk-based kefir grains include Tibetan Mushrooms, Yoghurt Mushroom, Yoghurt Fungus, Snow Lotus, Kin-oko or Tane-oko [Japanese], Tibetanischer Pilz [German].

Yeast.
Dairy products.
Produces lactase.
Lactose intolerance.
Kefir.

Kefir enjoys a rich tradition of health claims. In the former Soviet Union, it is used in hospitals and sanatoria for a variety of conditions, including metabolic disorders, atherosclerosis, and allergic disease. It has even been used for the treatment of tuberculosis, cancer, and gastrointestinal disorders when no modern medical treatment was available. Its consumption has also been associated with longevity in the Caucasus. Various scientists have observed digestive benefits of kefir, but controlled studies have yet to confirm their empirical findings.
Several studies have investigated the antitumour activity of kefir and of kefir grains. Specific cultures isolated from kefir were also shown to bind to mutagenic substances such as indole and imidazole. Immune system stimulation with kefir and with sphingomyelin isolated from the lipids of kefir has been demonstrated in both in vitro and in vivo studies.
Kefir possesses antimicrobial activity in vitro against a wide variety of gram-positive and gram-negative bacteria, and against some fungi.
[http://coproweb.free.fr/kefiranglais.htm]

SACCHAROMYCES

FEATURES OF THE GENUS

- Saccharomyces = sugar-fungus, in allusion to its ability to digest a range of sugars.
- Ferment sugars into ethanol and carbon dioxide. [The alcohol in bread evaporates during kneading and baking.]
- Produce heat during fermentation.
- Can grow in either the absence or the presence of free oxygen.
- Contain 40%-50% dry weight of protein.
- Lack external proteases [protein-splitting enzymes] and thus cannot assimilate proteins. [Yingling mentions as a symptom of Saccharomyces cerevisi- ae: "Anaphylactic (read: induced hypersensitivity - allergic) states produced by proteins and enzymes from lower order of life."]
- Appear mainly as separate cells widely distributed in or on the substrate, and only exceptionally uniting to form a mycelium. Yeast cells only live a few hours, so that fermentation is a constant process of birth, growth, and death. Division takes place by budding, a process graphically depicted by Money:

> They reproduce without sex, by dividing the nucleus and moving one of the resulting daughter nuclei into a bud or daughter cell that swells from one or other end of the mother. In this way, a family of daughters cracks from the mother's surface to join the ever-multiplying fray, each daughter her parent with a circular bud scar in the cell wall. The surface of the daughter is also scarred by the fungal counterpart of a navel [called the birth star], which marks the point of separation from the mother cell. Daughters become mothers, and with no need for a mate they thrive in a manner that would gladden the most militant feminist.

SACCHAROMYCES CARLSBERGENSIS **Cerev-lg.**

Scientific name	Saccharomyces carlsbergensis E.C. Hansen 1908.
Synonym	Saccharomyces uvarum Beij. 1898.
Homeopathy	Cerevisia lager. Lager beer.
Family	Saccharomycetaceae.

KEYS

- Yeast. Bottom-fermenting yeast.
- Lager beer.
- Reproduction rate is greater than that of Saccharomyces cerevisiae at lower temperatures.
- Burning flame-like sensation.

FEATURES

• Lager is produced by Saccharomyces carlsbergensis; ale or beer by S. cerevisiae. The latter species is a top-fermenting yeast, the former does its fermenting at the bottom. Lager brewing was introduced in the 1840s and is now the predominant brewing method worldwide except in Britain where top fermentation is dominant. The exact yeast species involved were not known then, but first isolated in 1888 by Hansen at the Carlsberg Brewery in Copenhagen and named after the brewery. The species is now commonly named Saccharomyces uvarum. True lagers are matured [lagered] in cold storage rooms for one to three months, although modern methods complete ageing much more rapidly. [Lager is the German word for ‘storage’.] The reproduction rate of Saccharomyces carlsbergensis is greater than that of S. cerevisiae at low temperatures and the opposite holds at high temperatures.

> There are hundreds of brands of beer, although only a few types, which divide roughly into top fermented beers, such as the traditional mild, bitter, pale ale and stout, and the bottom fermented beers, such as pilsner and lager. Ale is made by fermenting malted barley wort with a top-floating yeast which cannot ferment all the malt sugars and which works best above 10° C. Real ale is then allowed to setde and mature in the cask with the yeast still alive. Extra hops may be added. Real ale does not travel well and has a short life-span. Keg ale is filtered, pasteurised to kill the yeast, and

pressurised with carbon dioxide. It stores well and travels well. Stout is a very dark, bitter, top-fermented beer made from concentrated boiled wort. Porter is a sweet stout, popular with earlier generations but now out of favour and rarely brewed.

Lager is made from less strongly malted barley and is fermented with a yeast *[Saccharomyces carlsbergensis]* which works at the bottom of the wort, and which can ferment all the malt sugars. This yeast will continue to ferment down to 0° C. Lagers also store well. Fewer hops are added so it is less bitter than beer.

[John Emsley, *The Consumer's Good Chemical Guide·,* London, 1996]

MATERIA MEDICA

■> "A distinguished physician in a neighbouring city requested me to send him a high potency of'Lager,' if I thought that with it he could cure a lady of an undue fondness for that beverage."

With these words Samuel Swan introduced Lager Beer into homeopathy as an Antabuse-like aversion therapy to lager.

One dose of the MM [Fincke !] potency had a flaming result:

"Her symptoms after taking the drug were like a raging furnace flame in the entire urinary apparatus, with a fierce burning desire to urinate constantly, but it passed from her only in drops."

The effect prompted the physician to think of the remedy in yet another case:

"October 27th. - Mr. - -, aged over sixty-five, complained of a burning, fiery heat in the renal region, which passed upward to the neck, head, and mouth, causing a burning, parched tongue, compelling him to keep his mouth closed, and thus breathe only through his nostrils. This heat produced a sense of constriction around his neck, and made him feel as if he could not breathe, and as if everything about his neck and chest was too tight. The burning, fiery flame also passed down from kidneys, through both ureters to bladder and urethra. He was compelled to urinate from three to six times every night, and very often during the day. The stream was hot, small, direct, and no signs of any urethral stricture, but the suffering

during die passage of water was awful, and at the close of each micturition, day or night, the urine dribbled annoyingly.

Great lameness or soreness in his back in the renal region; the suffering was aggravated when he arose to walk, or a few minutes after being seated. Now all this had been coming on gradually for about fifteen years, but the madness of the flame came within the past few weeks, and he had thus far failed to obtain any relief from treatment.

I asked him to sit down, to rise up, and to walk up and down the hall. Each motion horribly aggravated the suffering. I then gave him on his tongue about fifty pellets No. 6 of Lager MM and waited about ten minutes for results, and then directed him to again try to rise and walk; to his astonishment he found he could do it with less suffering than before. I then detained him thirty minutes longer, and when he left remarked that his back did not trouble him near as much as it did when he came.

October 31st. - Patient again appears with a more cheerful countenance, and very thankful he was better. He now only rose once in the night, urinated with very little burning, and no dribbling; during the day he urinated two or three times in eight hours; the dribbling was slight and hardly noticed. There was no suffering in the back, except a little soreness and tenderness at times; still had some 'flames' rising up the back to the neck, but slight, and he cannot detect any of his former cruel sufferings. November 8th. - Patient called this morning to show me how well he is. He voted on Tuesday, and was full of joy; no symptoms.

Swan then reports that the lady's burning desire for lager had been extinguished:

> "The lady patient to whom Lager was first given reports that she is entirely well, and her friends say 'She now does not drink lager at all'."

The flame-like sensation turned out to have keynote value for Swan:

> "I have given it in the case of intense heat in the hypogastric region, extending like a flame up the left side to the region of the heart with frequent urinations in small quantities; water very high coloured, staining the vessel with a reddish deposit. Patient reports 'very much better in every respect, but not quite well'."

Yeast. Bottom-fermenting yeast. Lager beer. Reproduction rate is greater than that of Saccharomyces cerevisiae at lower temperatures. Burning flame-like sensation.

"N.B. I have since learned that the male patient, never used alcoholic drinks, nor lager more than three times in his life, and many years since left off tobacco.
N.B. 2. Provers should know that the best results cannot be obtained by taking the remedy by the 'schooner.'
With the IM potency they will get the characteristics."
["Proving of Lager Beer, with Cases Illustrative of Its Action," in The Homeopathic Physician, April, 1884],

LAGER IN THE MATERIA MEDICA

== *Germanium:*

Nausea after drinking lager, lasting until bedtime. Eructations taste of lager. [Proving Sherr]

= *Falcon peregrinus:*

"Have two lagers which give me a lift and I feel great again. Desiring lagers to give me a lift." [Proving Norland]

= *Kali bichromicum:*

Diarrhoea-like stool, consisting of brown, frothy, water; bloody; jelly- like; from lager beer. [Douglass]

Secondary bad effects from malt liquors; especially from lager beer. [Hering]

Of value from abuse of lager beer by waiters, brewers, etc., or by habitual drinkers. [Lippe]

Chronic diarrhoea off and on; > lager beer. [Lilienthal]

Bad effects from malt liquors, especially lager beer; nausea and vomiting of drunkards. [Nash]

= *Lappa arctium:*

Soon I felt the aching in both temples, but severer in the right. It increased while eating and subsequently, and got worse after drinking some lager in the evening. [Proving Jones]

= *LSD:*

Woke at 3 a.m. with terrible hangover headache, [very unusual] One pint of lager last night. [Proving Norland]

~ *Muriaticum acidum:*

Diarrhoea with much wind; stools profuse, dark green, brown, gelati-

nous; < morning and evening, after a meal, fruit, lager beer. [Lilienthal]

= *Tungsten:*

Irritable from noise in the morning after just one bottle of lager the night before.
Could not drink as much lager as usual. Felt full after half a pint.
Still relaxed and serene; like I had drunk half a pint of lager.
[Proving Annette Bond]

SACCHAROMYCES CEREVISIAE **Tor.**

Scientific name	Saccharomyces cerevisiae Meyen: E.C. Hansen 1883.
Synonym	Torula cerevisiae Turpin 1838.
Common names	Brewer's yeast. Baker's yeast.
Family	Saccharomycetaceae.

KEYS

- Rich in B vitamins and minerals.
- One of the oldest domesticated organisms.
- Workaholic.
- Regeneration versus conservation of tradition.
- Effervescence versus daily bread.
- Digestive problems. Food allergies.
- Boils, carbuncles, suppuration.

FEATURES

- The most important of the yeasts, and "one of the oldest of domesticated organisms."
- Also known as 'working yeast."
- Survives but is inactive in freezing conditions.
- The presence of plenty of oxygen and some food makes yeast grow fast and produce a lot of carbon dioxide, a process that suits bread-making.
- The presence of plenty of food [sugars] and almost no oxygen makes yeast breathe little and concentrate on turning sugar into alcohol, a process that suits beer-brewing.
- Many useful strains have been developed and given "the ease of manipulating the genetics of yeasts, the techniques of genetic engineering are now being used to improve them further through the addition of useful genes from other organisms." [Raven, Biology of Plants]
- Different strains of S. cerevisiae are used in the production of the various types of beer. Still other strains are used in the fermentation of dough to produce bread.
- Occasionally found as part of the normal endogenous flora of the human throat and alimentary tract. [Fisher]

• Isolated with increasing frequency from infections in debilitated and immunocompromised patients. It has been isolated from pulmonary, gas-trointestinal, and genitourinary infections, as well as from cases of fiin- gaemia, endocarditis, paronychia, and oral thrush. [Fisher]
• Yeast-forming colonies at 25° and 37° C. Colonies flat, moist, shiny or dull, white to cream to tan.
• The reproduction rate of S. cerevisiae is greater than that of S. carlsbergensis [S. uvarum] at high temperatures and the opposite occurs at lower temperatures.
• The specific name *cerevisiae* comes from Ceres, the Roman counterpart of the Greek Demeter, goddess of agriculture and cereals.
• *Ale* comes from the Indo-European root *alu-,* relating to magic, sorcery, possession, and visions, and is cognate with the word *hallucinogen.* [Pendell]

THERAPEUTICS

• Commercially available yeast extract is not, strictly speaking, an extract, but a product concentrated from yeast that, in a process of enzymatic selfdigestion, has broken down its own proteins. The product is sometimes flavoured, e.g., to remove the unduly bitter taste if brewer's yeast has been the starting point.
It is used as a food supplement due to high levels of B vitamins; also rich in iron, copper, selenium, chromium and glucose tolerance factor.
High-selenium brewer's yeast may have anti-carcinogenic activity. High-chromium brewer's yeast has putative anti diabetic activity.
The importance of yeast as a dietary source of B vitamins has been demonstrated clinically.

> Experimental subjects have been kept on diets deficient in B vitamins, with the object of determining the earliest clinical features of deprivation. The findings are in broad agreement from one study to another, particularly in emphasising the prominence of mental symptoms. Jolliffe *et al.* [1939] observed anorexia, lassitude, precordial pain, palpitations, dyspnoea and muscle cramps, but were unable to induce the neuritic symptoms of beriberi. Elsom *et al.* [1940] observed a marked psychological disturbance in one subject who became depressed and irritable, wept frequendy without cause and withdrew from social contacts.

Defective memory and difficulty with concentration were prominent complaints. This was considered to represent more than a simple reaction to physical malaise, and to reflect a true change in cerebral functioning. Riboflavin was without effect on the symptoms, thiamine caused partial improvement, but hill relief was only obtained on giving yeast containing all components of the B complex. O'Shea *et al.* [1942] in a similar experiment found measurable cognitive impairment on Porteus Maze scores which was relieved by thiamine and by yeast.

Kreisler *et al's* [1948] study appears to be unique in attempting to evaluate the effects of induced vitamin B deficiency in patients already mentally ill. This was a prolonged experiment with chronically hospitalised schizophrenic and demented patients. The observations were largely impressionistic, but indicated both aggravation of pre-existing psychotic disorder and the development of new mental changes. Moderate restriction over 1-2 years was associated with gradual diminution of activity, dulling of affect and loss of interests.

Severe restriction sometimes led to the explosive onset of serious emotional disturbances with loss of inhibitory control, exaggeration of pre-existing hypomanic or depressive features, and the emergence of paranoid trends. Recovery on giving yeast extract containing the full range of B vitamins was said to be often dramatic and sudden.

[Lishman 1987]

• Contains relatively high amounts of nucleic acids, which can be toxic if eaten in excess. On hydrolysis they yield purines [= pure uric acid] and phosphoric acid. Purines are associated with gout.

• "In olden times brewer's yeast was considered a tonic and antiseptic, and often prescribed in enteric fevers. [S.L. has a tablespoonful of fresh brewer's yeast in a pint of water as a beverage, often in alternation with phosphoric acid lemonade, and no other treatment necessary] The English physicians consider it a mild purgative. Mettenheimer gives it with success in obstinate constipation, and others found it of equal benefit in catarrhal and diarrhoea, among the disturbing contents, and thus restoring normal digestion. In many cases of phthisis tuberculosis it checked the exhausting diarrhoea after the failure of other remedies. In fact, in the catarrhal affection of the apices of the lungs, that first stage of threatening consumption, it relieved the cough and the short breathing, and in some cases restored health, especially

where the vital force had to fight against a tubercular disposition. Strict individualization is necessary, says Mettenheimer, as some patients can hardly bear a teaspoonful. Lay people often use brewer's yeast in hot milk for chronic constipation, and for ages its external use has been with them a favourable application in burns, and internally and externally in scrofulous skin diseases. — Allg. Med. Centre. Zeit. 36, 1889."
[S.L., "Brewer's Yeast as a Remedy"; The Homeopathic Physician, Aug., 1889]

• Yeast has been given internally in cases of debility, boils, carbuncles, and suppuration, "and there is some clinical evidence of its value. In cases of general debility, with weak, imperfect digestion, coated tongue, and unhealthy, fetid stools, it is said to act well as a tonic and aseptic. In continued formation of boils and carbuncles, whether primary or dependent upon diabetes, yeast is often of service. In flatulent distension of the lower bowel, enemata containing yeast have been given."
[Charles D.F. Phillips, Materia Medica and Therapeutics Vegetable Kingdom, 1886]

TUMOURS

• Various macroscopic fungi have a history as folk remedies for cancer and some of them are currently under investigation for their anti-tumour properties, which are believed to be mainly due to polysaccharide-protein complexes and polysaccharides such as beta-glucans. *[See* Agaricus blazei and Family Polyporaceae.]
With the steep rise in the incidence of cancer the use of yeast at one time has been attempted in cancer treatment.

> In addition to the use of yeast as source of certain vitamins, several reports suggest the use of yeast for other therapeutic purposes. For example, Sugiura and Rhoads [1941] have stated that the inclusion of yeast in the diet may be used for the prevention of certain types of experimental cancer. There are a number of known carcinogenic compounds that are often used to produce cancer in experimental animals.
> One such substance is dimethyl-amino-azobenzene, formerly used to colour butter substances and hence is commonly called "butter yellow." Several investigators have reported that when rats are fed a rice diet containing butter yellow, liver cancers commonly develop, but Sugiura and Rhoads found that when brewer's yeast was included in the rat diet an

inhibitory effect upon the development of liver cancer could be noticed; furthermore, the inhibitory effect diminished when the quantity of yeast in the diet was decreased.

When the basal diet contained as much as 15% yeast, liver cancer occurred in only 5.8% of the rats; with 6% yeast in the diet 40% of the livers were normal, 30% were cirrhotic, and 30% had a few small tumour nodules; of the rats fed with rations containing only 3% yeast, 30% had normal livers and 70% had livers with many cancer nodules. Use of a diet containing 0.6 g of butter yellow per 1000 g of ground, unpolished rice resulted in cancerous livers in 100% of the rats fed. Kensler and others [1941] presented evidence that seemed to indicate the lack of at least two factors in a basal diet of brown rice and carrots, which render rats susceptible to the carcinogenic effect of butter yellow. One of these factors they found to be riboflavin, the other to be present in vitamin-free" alcohol-extracted casein. From the work of Sugiura and Rhoads it is evident that both protective factors are present in brewers yeast.

McLeod and Ravenel [1938] injected extracts of *Saccharomyces cerevisiae* and *Aspergillus niger* into about 150 cases of advanced malignancy regarded as hopeless. Nearly all patients showed decided improvement, and in many instances there was marked shrinkage of tumour masses. Size reductions took place very rapidly, and pain was greatly relieved. Degeneration and necrosis of tumour cells accompanied other changes. Cures were not obtained and relief from pain was not permanent, since the patients failed to respond further after a number of injections were administered.

[Gray 1959]

Interest in yeast as a possible anti-carcinogenic has been renewed recently due to the high content of immune-modulating beta-glucans in the cell walls of yeast and, in certain strains, the selenium content. Selenium-enriched brewer's yeast given to deliver a daily dose of 200 micrograms of selenium was found to reduce the incidences of lung, prostate and colorectal cancer in one study.

SYMBOLISM

• Among the early settlers in North America, yeast served as a metaphor for the starting of married, mature life while retaining family traditions. It was the custom to give a daughter a bit of a yeast starter as a wedding gift,

symbolically representing sustenance despite the separation from the mother. The daughter, then, would try to keep the starter going until she would have a daughter of her own. In this way, good starters have been perpetuated for generations on end, much in the same fashion as with kefir cultures [yoghurt plants].
Keeping the right balance is a tricky task. Umbilical cords are there to be severed, but not to be denied. Too strict conservation of tradition constipates the flow and is like trying to preserve bread: it soon becomes old and mouldy. Retaining the essence, the leaven or gist [Dutch word for yeast], on the other hand, ensures perpetual regeneration. One can make one's own bread, fresh each day and yet respecting the family's recipe.

- The use of starters by prospectors and trappers in Northwest America was based on the identical principle. While tracking through the wilderness, they carried with them a piece of dough, termed "sourdough," for making bread and to leaven a new batch, so that they did not need to live on hardtack. Hence ferment [yeast] stands for anything that makes a general change.

- Although Saccharomyces requires oxygen it manages fairly well in a relatively anaerobic environment, for a while. Aeration or oxygenation has to be supplied on a continuous, or at least on an intermittent base. When it is closed up in a restricted environment, it will die in its own excrement.

- Fermented drinks are "images of an effervescence of knowledge which enables the spirit to surmount its normal limitations and to attain through intuition or in dreams a knowledge of the deepest secrets of nature and of the universe."
[Chevalier & Gheerbrant]

- On the other hand, fermentation represents the conversion of crystallized matter [sugars] into buoyant bubbles [carbon dioxide] and inebriety [alcohol], fermenting the passions. As such it leads away from the spiritual and results in decomposition and decay. This is exemplified by a custom in ancient Palestine to throw all leaven out of a home, including all the leaven of three neighbouring houses, when someone died. The belief was that the angel of death had thrust his sword into the leaven.

• In the constant cycle of birth, growth, and death, fermentation may be regarded as an essential manifestation of life triumphant, of the passage from death to life. Throughout Jewish history and tradition, unleavened, or unfermented, bread has implied an element of mourning or penance, since unleavened bread is to leavened bread what ashes are to fire.
In Alchemy, metals and jewels were thought to 'ripen in the soil, a process symbolic of cyclic ideas and eternal return. It is connected with the work of transformation and transmutation as the preludes to regeneration.

WORKAHOLISM

• The word 'workaholism' appropriately depicts the ceaseless diligence of Saccharomyces, the 'working yeast.' This yeast both works and produces alcohol. When the alcohol concentration reaches a certain level it dies; it has worked itself to death, drowned in its own produce. Taking up the fruits of its sacrificial labour to drown one's sorrows yields no relief, since sorrows "just become better swimmers," as Steve Sanfield has it.
With the exception of unleavened bread, there is no bread without yeast. Bread is generally associated with one's living or livelihood, exemplified in various expressions: daily bread; bread [money]; bread-and-butter [routine work undertaken to ensure an income]; breadhead [someone motivated by money alone]; bread study [a study taken up as a means of gaining a living]; breadwinner [person earning a living for a family]; on the breadline [living at subsistence level, with just enough to make ends meet]; take the bread out of someone's mouth [to deprive someone of the means of living]; know which side one's bread is buttered on [to know how to act for one's own best interests]; cast one's bread upon the waters [to be generous without expecting earthly reward]. [Chambers Dictionary]

• According to superstition, to dream of yeast is a sign that one's next undertaking will be successful, although it may also mean that another sort of undertaking has been successful, namely that the most important woman in one's life is pregnant, whether wanted or unwanted.

• An old belief has it that anyone who pricks a loaf of self-made bread with a fork or a knife will never be 'a happy maid or wife' since this should be done with a skewer. The belief is a commentarv on rhe facr rhar anvone who

cannot bake something as basic as bread correctly can be hardly be expected to manage the harder tasks of housekeeping.

• Yeast has been linked with bees; both are industrious workers. In the glass jar in which bee wine is made, the lump of yeast will grow and bubble, floating up and down like a bee.

> We may here refer to "Bee Wine," a curious concoction, which is brewed in country households. The active principles in the brew are known variously as Balm of Gilead, Wine Bees, Water Bees, Californian Bees, Macedonian or Salonika Bees, Mesopotamian Bees, Jerusalem and Palestine Bees; and, in fact, as bees of almost any locality sufficiently remote to render verification difficult. The brew is produced by the fermentation of sugar by means of yeast, *Saccharomyces piriformis.*
> A curious effect is obtained in the jars of sugary solution being fermented, by reason of the yeasty lumps being constantly carried up to the top of the brew by the rising of bubbles of gas, and then sinking to the bottom again as soon as the bubbles have been liberated. The lumps are composed of the yeast in question, in combination with a bacterium, *Bacterium vermiforme,* and are the "bees" of popular estimation. A dear old lady of our acquaintance solemnly asseverates that they are "alive" in every meaning of the term, and says that if she does not give them their spoonful of sugar every morning, they will surely die. [Rolfe & Rolfe 1925]

• In Norway it was believed that magic prerequisites had to be fulfilled to allow the yeast to do its work. It had to be completely quiet, brewers were obliged to stay awake over the beer during the night, and children had to take off their shoes and keep quiet when beer was brewed in the house.

• Wine drinkers and beer drinkers are both apt to fall, Aristotle noted, with the difference that the former fall on their faces when drunk and the latter on their backs.

DIONYSUS

• The great god Osiris of the Egyptians observed that man was heavily burdened with troubles on his long hard journey from this earth to the land of the dead. So Osiris presented fermentation as a gift to lighten the weary

load. The Greeks gave the credit to Dionysus, the Romans to Bacchus, gods around whom sprang up cults characterized by frenzied outpourings of joy. [Kavaler]

• Bread and wine, as well as beer for that matter, are borne from the same mother: the tiny organism Saccharomyces. Happiness, sang the oft-quoted poet Omar Khayyam, is he who has a "book of verses underneath the bough, a loaf of bread, a jug of wine and thou ..."

It is often said "man does not live by bread alone." Aside from this basic nourishment, the hope for a well-fed future, man also requires a fair share of vital force and spiritual blessing to warm his heart and blood. Wine, first and foremost a symbol of joy, stands traditionally for the warming blood. "Only with wine does the true self emerge, when the mind, like a cave, is empty of doubts," wrote the Chinese sage Su Tung-Po.

Omar Khayyam linked bread with wine, whilst bakers until the 20th century considered bread and beer an even more natural alliance. It was standard procedure for bakers to use leftover brewer's yeast as the leaven for bread.

In Ancient Greece, wine replaced the blood of Dionysus and represented the beverage of immortality. The wine of Dionysus should not be confused too easily with the unleashing of dissipative energies.

> In a more deeply religious sense, despite its perversities and even through their medium, the cult of Dionysus bears witness to the tremendous effort made by human beings to break the barriers which separate them from the divine and to set their souls free from the trammels of Earth. Sexual excess and giving full rein to the irrational were rather clumsy efforts to grasp the superhuman. As paradoxical as this may seem, if we consider his myth in its entirety, Dionysus symbolizes the attempt to spiritualize life forms, from the plant to the ecstatic, since he is the tree- and goat-god, the god of religious enthusiasm and the mystic marriage. In his myth he synthesizes a whole cycle of evolution.
> [Chevalier & Gheerbrant, Dictionary of Symbols]

> Sobriety diminishes, discriminates, and says no; drunkenness expands, unites, and says yes. It is in fact the great exciter of the YES function in man. It brings its votary from the chill periphery of things to the radiant core. It makes him for the moment one with truth.
> [William James, The Varieties of Religious Experience]

• Between the down-to-earth 'daily bread' and the dignity of 'noble wine' lies a full bouquet of opposites: the dualistic tendencies of the Dionysian archetype, which can make one "rapidly cross the borderline between these opposites."

> Dionysus's mother died while he was still a foetus. In his mythology and worship, foster mothers and nursemaids, who were inconsistent and unstable in their nurturing, surrounded him. Later Dionysus descended into Hades to find his mother. Often men who are identified with this archetype also seem to be seeking an idealised woman who is both mother and lover, seeking unsuccessfully to find "her" in a series of relationships. This is especially true when there has been a physical or emotional separation between mother and son.
>
> The archetype may also predispose a man to have an inner psychological relationship with the Great Mother. Then he feels himself associated with the maternal world, possibly drawn toward expression of "maternal instinct" via caretaking occupations and domestic interests that are more traditionally feminine. Or the connection with the Great Mother may be a spiritual one [especially now with the return of the Goddess as a spiritual principle into the culture], perhaps expressed through becoming a follower of a charismatic woman religious leader.
>
> The result may also be a man who feels intimately related to women, who much prefers the company of women, who is a lover of women, merging with them in the ecstasy of lovemaking, and who intuitively understands women's experience.
>
> Women often are drawn to take care of the Dionysus man, just as he seeks to be mothered by them. In his need, he seems a "motherless boy," which evokes maternal feelings.
>
> ... Of all the masculine archetypes, Dionysus is the archetype of intense opposites. ... Major emotional shifts are precipitated by minimal events. To be in a relationship with a man [or woman] who is crossing back and forth thus is to be treated like an exquisitely precious and valued person one moment, and like a terrible monster the next. At the same time, he may fluctuate between being a passionate lover and a cold stranger.
>
> ... Women, too, can become possessed by this archetype. The Maenads - the women worshipers who sought the god on mountain tops - could change from loving maternal women to raging Maenads without mercy. Beauty and fatal danger were hallmarks of this dualism.
>
> [Jean Shinoda Bolen, Gods in Everyman]

YEAST ALLERGIES AND CROHN'S DISEASE

Yeast is among the seven foods that most commonly are associated with food allergy reactions. These seven include: corn, eggs, milk, soy, sugar, wheat, and yeast.

This places many dietary sources of yeast under suspicion as being potentially allergenic. Yeast is used in the manufacture of milk fortified with vitamins, buttermilk, sour cream, baked goods leavened with bakers yeast [breads, croissants, coffee cakes, pumpernickel, pastries, yeast breads, hamburger and frankfurter buns and rolls, pretzels, etc.], meat coated with cracker crumbs and fried, mushrooms, truffles, cheeses of all kinds, fermented brews, vinegar-containing foods [pickles, olives, mayonnaise, ketchup, salad dressing, steak sauce], soy sauce, and molasses. Wild yeasts, present everywhere, may end up in fruit juices [unless freshly squeezed], dried fruits, and homemade pickles. In sourdough bread the yeast, often of the genus *Candida* or wild yeast, is the partner of lactic acid-producing bacteria. Yeasts, moulds, and bacteria all co-operate in the fermentation of cocoa beans, to develop the flavour of chocolate.

Saccharomyces spp. and Candida spp. are commonly lumped together and simply called yeast' despite the fact that the latter is dimorphic [either yeastlike or filamentous in behaviour] and the former is not. Although strictly speaking incorrect, the terms 'yeast' and 'mould' are also often used interchangeably. Candidiasis patients generally will get the advice to eliminate all yeast-containing foodstuffs from their diet and to avoid 'moulds' and mould-derived antibiotics such as penicillin.

Yeast allergy is not uncommon in patients with irritable bowel syndrome and/or Crohn's disease. Studies have found an array of antibodies against food antigens, such as milk proteins and bakers' yeast, in Crohn's disease patients. Crohn's disease patients proved to have a higher incidence of allergic reaction to baker's yeast than non-Crohn's sufferers. This has led some researchers to the conclusion that baker's' yeast may cause or contribute to symptoms of Crohn's disease. The elimination of baker's yeast may be helpful to Crohn's patients. [Gastroenterology, April 1993]

An interesting link has been found to exist between Saccharomyces cerevisiae and Candida albicans on one side and mercury toxicity on the other side. Both yeasts, as well as certain bacteria, mediate three transformations of

mercury: they reduce Hg(II) to volatile elemental HgO, they break down methyl mercury [and other organomercury compounds], and they methylate Hg(II). This seems to indicate that S. cerevisiae and Candida albicans might be differentials in the clinical conditions for which Mercurius is so often prescribed, irritable bowel syndrome and Crohn's disease, and yet equally often fails to produce a lasting effect.

MATERIA MEDICA

Sources

[1] Introduced by Lehman and Yingling. Not proved, hence clinical symptoms only but many have been verified.
[2] Based on a number of cured cases, Yingling drew up the schema below. The italics indicate "salient features as probably highly characteristic of Torula Cerevisia."
[3] Proving British School of Homeopathy [Lisa Mansfield & Deborah Schofield], 11 provers [9 females, 2 males], 6c, 30c, 200c, IM; 2005.
Symptoms marked LD.

Mind

= Irritable. Restless. Hysterical. Extremely nervous, goes almost crazy.
=» Worries and is worn out.
Nervous tension at night, can't sleep.
= [Will go around the square to miss seeing a good friend. Don't care to talk to any one.]

Theme: Survival

Issues around survival were prominent. There was increased anxiety about health, a sense of being under threat and a desire for safety and protection - for themselves or others. This theme was so strong that some provers felt protected by the substance from the very moment they chose their bottle. Dreams were of situations associated with the need for survival, either personal or involving the rescue/protection of others. They demonstrate a vulnerability/ anxiety about survival. In contrast to the sense of protection from the substance, others experienced the polarity. This was expressed as an increased anxiety about health or their general state.
A key period of vulnerability is childhood when dependency upon others

ensures our survival. It is interesting therefore, that many provers found themselves acting or speaking in a childlike way, using childish vocabulary or making up words.
A positive element was the feeling of being and/or looking younger [as distinct from the childlike vulnerability], [LD]

Theme: Hibernation
Want to sleep, hibernate. Cosy and comfortable in bed. ... I feel like an animal that wants to find a warm dark quiet corner to sleep. ... Finding it increasingly hard to get up and out there. It's too dark. I need to rustle down in the warm and not be disturbed until it's my time to get up. [LD]

Theme: Colours
For such a bland, beige substance it was striking how this proving affected provers' sensitivity to colour. This manifested in many ways from a desire to draw using lots of different colours, being drawn to colours in nature, desires for brighdy coloured food, wearing particular colours, dreaming in techni- colour, and even analysing television programmes according to their artistic use of colour. [LD]

Head
<·> Aching in back of head and neck.
= Headache & sharp pains all over body.
= Severe pain in left temple, extending to left occiput; pain in temple < by pressure on occiput; & gas, stomach deranged; & nausea.
=» Aching in left or right temple, extending all over side of head; it began on and to the occiput; and down shoulders at times.
=4 Dull, heavy feeling in vertex.
« Head hot and feverish.
=■ Headache, < from constipation.
= Headaches were prominent. Sensations included sharp, shooting, pushing, pressure, heaviness, bruised and pulsating. Like a basin on the head pushing down,a band around the head. Sensations: trying to lift the skin off head, like a skullcap, stalk pushing into the head, a wide wooden peg, plug, stone pushing down on head. The words pushing and pressing are prominent here, reminiscent of the kneading and knocking-back stages of dough-making, to which yeast is susceptible. [LD]

Eyes
= Red and watery. Itch and burn. Lids stick in the morning.
9= Neuralgia around eyes and teeth.

Nose
= Catarrhal discharge from posterior nares into fauces.
« Sneezing and wheezing constantly while baking bread.
Sneezing and wheezing < from dust of any kind.

Face
= Acne, pimples.

Mouth
= Awful bad taste.
=» Tongue coated brown on posterior part.
= Tongue feels swollen and sore. Coated in patches.

Throat
= Clutching feeling at the throat.
= Lump in throat pit that felt like it wanted to come up, but would not; > chewing gum.
<= Dryness/rawness/dirtiness and prickliness > very hot drinks. [LD]

Stomach
= Thirst. Appetite much impaired. *Digestion poor.*
= Very thirsty; for water; need moisture. [LD]
» Strong desire for sweets, chocolate, gummy sweets. [LD]
<= Sour stomach.
Pain in stomach and abdomen one to two hours after eating.
= Belching gas; food. Gas in stomach and abdomen after eating.
*= Soreness like a lump.
» Uncomfortable feeling as though the food did not digest.

Abdomen
= Great soreness all over abdomen, especially in region of right ovary.
4= Severe neuralgia of the organs of the abdomen, pain shifts to different parts of the abdomen during the twenty-four hours.

Rich in B vitamins and minerals.
One of the oldest domesticated organisms.
Workaholic.
Regeneration versu conservation of tradition.
Effervescence versu daily bread.
Digestive problems
Food allergies.
Boils, carbuncles, suppuration.

" Uncomfortable feeling of largeness around abdomen.
“ Much gas. Sense of follness. Rumbling.

Rectum
= *Constipation.*

Urinary
“ Urine scanty.

Female genitalia
” Pam in left ovary. Conscious of ovary; disappears suddenly.
"* Terrific pain in region of right ovary.
=> Leucorrhoea yellow, fetid.
» Continuous discharge from vagina; acrid; before menses.
“ Severe burning in vagina.
“ Menses scanty, greenish, very offensive.
“* Lochia suppressed by vaccines.
“ Suppressed sycotic discharges.
~ Gonorrhoea of three months, yellow; bad, offensive odour like mould.
” In general female provers found their pre-menstrual and menstrual symptoms greatly improved. Breast tenderness, dysmenorrhoea were improved and flow was lighter. [LD]

Respiratory
“ Asthma for some years with gluey expectoration. Generally < expiration, may be the reverse.
= *Worse baking bread* [Lye.]
= Cough: Every morning.
“ Expectoration yellow.

Back
“ Drawing sensation in muscles of back, especially the neck, head and down the back.
[Pain under scapulae; especially if sits long in one position.]

Extremities
“ Hands cold like ice.
= Hands go to sleep easily.

= Arms tired and weak from elbows down.
» Brownish spots on left arm.
<== Limbs feel like a burden.
= Tired and weak from knees down.
<= Flesh sore on thighs and back of limbs.
= Itching, especially on ankles, white spots come after rubbing.
= Eczema from knees down on legs, and much itching.
=> Eczema, especially around the ankles.

Sleep

» Very poor, disturbed by great restlessness. [Is drowsy, but the moment she goes to bed her back begins to crawl and it seems impossible to keep legs still, they move in spite of her, lasting from two to six hours; rising to sit in chair does not >.]
» Restless, could not lie in one position but a few moments, preventing sleep.
= Poor rest if goes to bed with empty stomach.

Skin

» Tinea versicolor, covering whole chest.
— Eczema. Eruptions.
» Boils. Carbuncles. Recurrent boils in most places.

[A substance isolated from brewer's yeast called skin respiratory factor or SRF has found application in some cosmetic and wound-healing products, as well as in some haemor- rhoidal preparations.]

Generals

= General coldness, needs warm wraps in warm weather.
= Sycosis and its results. Sycotic discharges. Sycotic remedy in all stages, acute, subacute and chronic.
= Sour, acrid, yeasty, mouldy odour from discharges.
■» Burning sensations.
= Increased hair growth - body, beard. [LD]
= Does not feel clean after a bath.
= Anaphylactic states produced by protein and enzymes from lower order of life, especially from sycotic conditions.

Food issues

As yeast is generally ingested on a daily basis, the food/appetite symptoms are relevant. Unsurprisingly, desire for carbohydrates increased, particularly bread, toast, croissants, brioches, teacakes and bagels. These were better tolerated by those normally bloated after carbohydrates. Yeast's connection with vitamin B was evident with some craving marmite [yeast extract] and others feeling the need to stop their daily B6 supplement. Aversion to pork/milk/eggs changed to cravings. Ravenous/insatiable or reduced appetite. Weight fluctuations incommensurate with amount eaten. [LD]

[Unmarked symptoms: W.A. Yingling, Torula Cerevisia; Proceedings of the International Hahnemannian Association, 1919-1921, no. 20]

CASES

The following are some of the cases on which Yingling based his schema.

1) Miss H., aged 38, came to the office with a very severe headache, pain in the left temple involving the eye, across the left side of the head to the occiput. When she pressed on the occiput the pain in the temple was much worse. She also had a very profuse yellow vaginal flow before the periods. Belching and deranged stomach. *Torula* very soon relieved all this. In about two years she came back with a similar headache, but not near so bad. *Torula* again gave relief.

2) Mrs. O., aged 29. Headaches all her life. The past two or three years has had sick headaches. Pain on one side at temple, usually right side, or may be the left side; passes backward to the side of the occiput and nape of neck on the side of beginning. Now goes down further into the shoulders. Aching, strong pain, some throbbing, never shooting. Usually starts in the morning, growing worse during the day and lasting 24 hours or more. Head hot and feverish. Pain mosdy behind ears and down nape [more severe, I suppose]. Wears glasses, but sees no change from them. Comes at no particular time; four times the past month. Great weakness all over and soreness of the whole body. Menses irregular the past few years. Headaches seem to check the flow which is scant and of short duration; very dark and sometimes clotty. Was operated on for invisible goitre, which ameliorated the choking feeling, but the heart trouble was the same as before the operation. Constipation since a child; has used physic since childhood. Worry, overwork, nervousness and the like brings it on, yet may come

without apparent cause. Worse from constipation also. During the past three years has nausea and vomiting of bile, yellow, slimy, sometimes white mucus, very bitter; bad taste. Feels irritable, cross and nervous. Eyes feel heavy and burn. Dizzy with the headache, worse rising up. Has fainted several times, worse noise, walking, and rising up. Sometimes better from pressure. Worse from any jar, touch of bed; wants to be real quiet. June 14, 1919, she received *Torula* 500 [YJ. July 16, reports a headache just before menses on right side, but not so severe as usual, and lasting only seven or eight hours. Not so constipated as before. Repeat Torula.

October 13, writes me: In August had a breaking out on head and the local doctor said it was from the stomach, prescribed locally and gave Soda for the stomach. Following this more headaches and more severe. The last two began on the side of the head and went to the vertex, not as before to the occiput. *Torula* 900 [Y],

October 29. "No headache since starting to take the last medicine though had the period in twenty-five days, but no headache." *Torula* 900, one dose.

November 12. On October 31 and November 1 had a dull feeling on top of head, but never had to stop for it as formerly. Sometimes has an itching; if she rubs it, white spots will come; mostly on ankles, a few on hips and arms. Gaining in flesh and feels fine.

November 25. Menses in twenty-four days; three days after got up with headache starting in right eye and going to top of head, got worse during the day and by night it was so bad she took the extra powder [Torula 900] with quite prompt relief. *Torula* 900 [YJ.

December 11. No headaches. Menses in 30 days. Evening of third day pain started in right eye, went to back of head and down neck. Gaining flesh. Less costive. No late report.

3) Mrs. S.W.G., aged about 30. Has been a patient of mine for the past fourteen or fifteen years, and has a chequered career, now much better, then down again, very nervous and stomach easily upset. Such remedies as Sulph., Nux vom., Lyc., Bry. would control matters for a month or two. As she lived in a neighbouring city I could not get full particulars as needed.

October 30, 1919, she wrote me that she was suffering from her old dizziness or swimming of the head. Pain under ribs of left side in the evening, none in the morning. Urine scant. Such an uncomfortable feeling in the stomach as if food did not digest. *Torula* 500 [Y].

December 2. Soreness in bowels. Dizzy spells, especially on the streets. Sore spot on left side of back from waist down. Such uncomfortable feeling about the

heart, with difficult breathing, worse from exertion. *Torula* 500 [Y],
June 9. Has been unusually well, but lately stomach troubles some. Dizzy spells, sudden attacks lasting four or five minutes, followed by a suffocating feeling. Belching gas. Heart beats fast going up and down stairs. *Torula* 900 [Y], June 17, 1920. Weak, exhausted, depressed. Pressing down of uterus. Limbs feel so heavy, worse on feet. Pain across back, wakens her early in the morning, worse while in bed, better when she gets up. The great exhaustion and weakness being the main features this time, and from past experience, I gave her *Echinacea* 200 [G].
July 3. Exhausted feeling much better. Dizziness worse, spells more frequent and after effects worse. Such soreness in stomach, like a lump. Pain over left eye. Menses just over, had very bad odour. Can hardly wait till bedtime. *Torula* 900 [Y],
I have had no word since. From her past faithful reporting I feel sure she is doing well.

4) Mr. WW, aged 70. Eczema on legs from knees down, much worse about the ankles, for more than 25 years. Has often been suppressed. Has been on the elbows and end of spine. Itching, oozing water when bad. Lumps under the skin. Rubbing inflames and causes itching. Has been suppressed lately and is now much worse about the ankles. Has used Radium water as a wash, which seemed to dry it up, but it promptly returned on the ankles. In consequence of the seeming relief from Radium water I decided to try Radium in potency and gave him the 200 [EK]. Being no better I gave him *Natrumphos., Chelidonium, Rhus rad., Sulphur* at various times, but failed to get good results. *Natrum phos.* and *Rhus rad.* especially are called for in this eruptive trouble about the ankles, but failed in this case.
November 6, 1920. *Torula* 12 [Y] one pellet, three times a day.
November 16. Legs very much better. No itching. Eruption almost gone. The only application allowed to satisfy his mind was hot water and olive oil.
December 26. Was about cured up, but is coming back again, but not nearly so bad, just showing a little. *Torula* 12 in pellets.
January 4, 1921. Gradual change for the better. Condition was better with slight changes at times for the worse, though never as bad as before. In March reported “improving right along in every way.” I have not seen this case since March 22, but as he was improving right along I feel sure he would come back if worse again. The action of the remedy was good considering the age of the patient and that he had no experience in Homeopathy, would not follow directions and kept doing what he ought not to do. If he returns I shall put him on the higher

potencies.

5) Mrs. F.L.M., aged 50. Had something like the 'flu last fall, slow recovery, settled in lungs. Heart very weak. Sleep poor. Digestion poor. Bilious dysentery till a few weeks ago and not all right yet. Twice the last month laid up with bilious attacks, cramps in stomach, tongue coated in patches and after an attack tongue feels swollen and sore. Menopause; period in September and February, rather light brown. Extremely nervous, goes almost crazy. Some nights sleep very poor, and nights frightful, could lie in no one position five minutes. Eighteen years ago had a similar sickness which "ran into ulceration of the stomach and bowels." Was very ill for a year. Blood pressure 110. Owing to excessive crude drugging she was given *Nux vom.* 20M [EC.].

March 27, 1919. Dysentery, blood and mucus; piles. Much gas in bowels, rumbling. Pain under scapulae. Sort of hot drawings on left side of body - "these seem the most trying." Will go around the square to miss seeing a good friend. Don't care to talk to anyone. Has lost fifteen pounds in the last year. Repeat *Nux vom.* 20M.

April 11. First few days after medicine felt almost well, but on the fourth day got up with bad taste and a stiff neck and diarrhoea. Neck trouble next day went to small of back; if she got down it was hard to get up. Hunger, but nothing tastes good. Can't sit in one position long. Pain through bowels which is usually the forerunner of gas, followed by dysentery. *Torula* 5 00 [Y].

June 21. Medicine helped very much. Digestion is better. Pain through lower back and bowels almost gone. A little gas occasionally, but it is not to be compared to what it was. Pain under shoulder blade about gone; feels it sometimes if sits long in one position. Only complaint is poor sleep. Is drowsy, but the minute she goes to bed her back begins to crawl and it seems impossible to keep legs still, they move in spite of her, lasts from two to six hours. Getting up and sitting in chair does not relieve. "Dysentery much better." Disposition and colour improving. Repeat *Torula.*

August 21. Bowel trouble seem all right. "If I am worse again will write for sure." No word since above.

6) G.W.E., aged 62. In 1905 he had a severe cough and marked decline which was entirely relieved by *Bacillinum* 6M [G], November 15, 1919, he writes: For a year on awaking in the morning feels very queer and dizzy, with nausea. Lump in throat pit that wants to come up but will not. Better chewing gum. Belches food, sour at times, or watery and not so sour. Some bloating and rumbling in abdomen. Passes flatus both ways, up and down. Breathing hard. Gets hot with nausea and sweat and chills; after vomiting two or three times gets some relief.

May be several hours before he can walk about from the dizziness. Bowels nearly normal, may be two or three stools a day. Ringing in the ears, < right, from the blood pressure as he thinks; heart beats hard and fast from the spells. Eats well and nearly always ravenous appetite; sometimes cannot get enough to eat. Gradually worse, spells coming more often. *Torula* 200 [Y],

November 26. Stomach better. Not bothered with lump in throat. Sour stomach better, only a touch every two or three days. No bad sick spells since medicine. Has been a little dizzy three or four times. Bowels regular. Ear rings nearly all the time. *Torula* 200 [Y].

December 25. Only has a dizzy spell about once a week, lasting only a few minutes. Lump in throat remains better. *Torula* 200 [Y].

January 2, 1920. Had a little dizzy spell, and one next day, but feels well since. *Torula* relieved him of all his complaints except the dizzy spells and as they kept coming back I gave him *Merc. dulc.* 9M [Y], repeated as needed, which wound up the case.

7) Mrs. S.H., aged 42. Had the 'flu in October. In following February began to feel very nervous, which affected throat, filling up for a while and then better. Gas in stomach and abdomen, passing down and up. No distress. No bloating. Dull pain above left groin in flexure of colon. Constipated and has taken much physic. Has lost 30 pounds. To start the case *Nux vom.* 9M [F].

September 1, 1919. Less gas, but left side of abdomen pains. Some rumbling. No pain. Menses six weeks past due. Cramps in calves of legs. Constipated. *Torula* 500 [Y).

September 18. Pain in left side of abdomen by spells, not so continuously as formerly. Gas in abdomen rumbles about. Bowels sluggish only at times. Menses came in six weeks at the last period. No cramping in calves now. *Torula* repeated.

October 1. Doing well. No bad spells. Feels better generally. Side bothers less. Sometimes a kind of pain in stomach [abdomen?], but less. Less gas than before. Bowels move better also. *Torula* 900 [YJ.

October 14. Doing well. No bad spells. Bowels gradually better. *Torula.*

October 27. Menses in three weeks, very profuse. Doing well otherwise. Side better. Some gas, but less. *Torula* 900 [Y].

November 21. Doing well. Menses in three weeks, much less flow, no pain. No bad spells. Bowels sluggish. *Torula* 900 [Y]. These repetitions are usually one dose in the potentised form. I begin the treatment with four doses, one night and morning. If worse after beginning treatment I give four doses.

December 17. Left side bothers a little after breakfast only at times. No bad spells.

Menses in three weeks as before. Very little gas or belching. *Torula* 2M [Y], January 27. Getting along well. Side better. Stomach better. She reports about the same with an occasional single dose of *Torula.*
July 7. Doing well. Some more pain in left groin. Bowels regular. *Torula* 4M [Y]. Continues doing well with an occasional single dose.

3) Mrs. C., aged about 80, a great-grandmother, came to the office the afternoon of May 5, 1921, short of breath, panting and said she feared she had heart trouble as she was so short of breath, could hardly walk to the office. She had great misery and distress in the left side about the short ribs, fullness and pushing up from accumulation of gas which affected the heart. Some belching and rumbling of gas. I gave her *Torula* 500 [Y], The next morning she phoned me that she "just had to let me know that she was entirely relieved of her distress and was feeling all right." She said the first dose relieved her very promptly and was now "feeling just fine." This very prompt action of the 500th potency shows that the remedy is active and reliable and should be further proven and tested.

4) Mrs. F.S.H., aged 69. April 21, 1921, asks for relief from severe bloating of stomach and abdomen, causing shortness of breath and such a tight feeling. Bloat always present, but < some days. Rush of blood to head so often. *Torula* 200. On May 11 writes that she is greatly improved.

5) Mrs. R., aged 77. May 6, 1921. Great shortness of breath on rising in the morning. Seems to be mucus in the lungs, with whistling. Dyspnoea, < walking, < exertion. Swelling about the ankles and above, < left one. Stomach much out of order. Much gas in bowels with rumbling. *Torula* 30 [Y], six powders twelve hours apart. On May 13 reports ankles better, stomach much better, gas better. Bowels move better. Cough remains, but she can now expectorate much easier, "the medicine loosened it up." Cough now only in the evening; does not prevent sleep. Breath very short on exertion and on arising in the morning, but wears away sooner. Made the trip to the office, six blocks, with less difficulty and breathing not badly affected.

ALCOHOLUS **Alco.**

Scientific name Ethyl alcohol. Ethanol.
Common names Grain alcohol. Beverage alcohol. Spirits of wine.

Fungi obtain nutriment from solutions of carbohydrates and the yeasts also obtain energy by breaking up these substances without the intervention of free oxygen [anaerobic respiration]. Many organisms are capable of producing ethyl alcohol, but in yeast it has become the normal routine, and may be regarded as the adaptation of a group of simple forms to a mode of life with a minimum of competition.
[Gwynne-Vaughan]

KEYS

- Sociability leading to self-glorification.
- Impairment of judgement; overstepping borders, crossing limits, breaking taboos.
- Social alienation.
- Self-castigation; self-reproach; punishment.
- The creeps.
- Neurological degeneration.

FEATURES

- Alcohols are characterised by a hydroxyl group [OH] bound to a carbon atom.

The familiar grain alcohol [ethanol] is a stimulant when taken in small amounts; toxic in larger amounts due to the formation of ethanol in the liver. When liquids containing sugar ferment, the sugars are converted to carbonic acid and ethanol; the ethanol can be separated by means of distillation.
Most of the lower-molecular-weight alcohols have commercial importance. They are used as solvents in the preparation of dyes, pharmaceuticals, antifreeze, esters, and other compounds; and mixed with gasoline and used as motor fuels.
Alcohol as a beverage has been and is closely associated with ritual use, social conventions and curative methods.

PHARMACOKINETICS

• Almost all of the alcohol ingested is metabolized, only a small fraction being excreted, through the skin, lungs and kidneys. The first stage in the digestion of alcohol takes place in the liver.

At each step of the metabolizing process, an enzyme breaks down the chemical. Ethanol is broken down by alcohol dehydrogenase to acetaldehyde and hydrogen. The hydrogen molecule causes the liver to bypass normal energy sources, that is, the hydrogen from glucose metabolism, and to use the hydrogen from ethanol. This excess of hydrogen production erroneously signals the liver that the body is in a "fed" state, causing the liver to cease producing glucose. This can lead to profound, life-threatening hypoglycaemia. Aldehyde dehydrogenase breaks down acetaldehyde to acetic acid, which is an innocuous substance.

When enzymatic action on acetaldehyde is blocked by the aldehyde dehydrogenase blocker disulfiram [Antabuse] or by loss of normal hepatic function, acetaldehyde can accumulate, causing an unpleasant illness consisting of malaise, nausea, and flushing. Large concentrations of acetaldehyde in the liver can cause hepatocyte [liver cell] necrosis, leading to cirrhosis and ultimately death. Acetaldehyde also interferes with vitamin activation. The alcohol dehydrogenase in the gastrointestinal tissue of non-alcoholic men oxidizes a significant amount of the alcohol in the gut before it enters the bloodstream.

However, Frezza et al [1990] have discovered that the gastrointestinal tissue of women and of alcoholic men contains litde alcohol dehydrogenase. The inability of women's bodies to make this "first-pass metabolism" accounts for their enhanced vulnerability to the effects of alcohol and confirms an age-old suspicion that women become intoxicated more easily than men, even when studies are controlled for size differences.

Some researchers postulate that some of the excess acetaldehyde travels to the brain and reacts chemically with neurotransmitters to make tetrahydroisoquinolines [TIQs] and beta-carbolines. Tetrahydroisoquinolines are similar to the addictive substance found in heroin and morphine. When TIQs are infused into the brains of monkeys, the monkeys develop an irreversible preference for alcohol over water. Beta-carbolines have been shown to cause severe anxiety, and it is hypothesized that people with alcoholism use alcohol to reduce the anxiety caused by previous

ingestion of alcohol.

Alcohol is absorbed partially from the stomach but mostly from the small intestine. If a person with an empty stomach ingests alcohol, it is in the bloodstream within *20 minutes.* The type of alcohol consumed affects the rate of absorption. Beer contains 4% to 6% ethanol; wine, 12% ethanol; and whiskey, 40% to 50% ethanol. Alcohol in beer and wine is absorbed more slowly than that in liquor, but the alcohol content does not account completely for its absorption rate. Food also slows alcohol absorption. Ethanol is distributed equally in all body tissue according to water content. Large persons or persons with great amounts of body water can ingest more alcohol than small persons or persons with less body water. Alcohol affects the cerebrum and cerebellum before it affects the spinal cord and the vital centres because the former areas contain more water.

The rate of absorption largely determines how quickly a person will become intoxicated, but the metabolic rate largely determines how long alcohol will affect the body. The metabolic rate is constant. The body can metabolize 10 ml of alcohol [1 ounce of whiskey or 1 glass of beer] every 60 minutes. In persons who drink alcohol frequently for years, hepatic drug-metabolizing levels are increased to hasten alcohol metabolism. Hot coffee, "sweating it out," and other home remedies do not increase alcohol metabolism nor do they speed the "sobering-up" process. Tolerance to alcohol occurs and is probably related to elevated hepatic enzyme levels and to cellular adaptations.

[N.L. Keltner & D.G. Folks, *Psychotropic Drugs;* St. Louis, 1997]

INEBRIATION

• "All inebriants are solvents and general anaesthetics," says Dale Pendell. "They all lead to unconsciousness. But each inebriant has its own agenda as to who goes to bed first. With alcohol the superego is the first to go." With the rise of the blood alcohol level the intensity of the clinical signs and symptoms of ethanol intoxication increases. After the initial excitatory phase four phases of increasing and eventually fatal CNS depression follow with continued alcohol intake.

[1] *Excitatory phase.* Euphoria; happy excitement; loquacity; loud talk; boastful; labile mood. Impairment of judgement, fine motor coordination, and reaction time. Decreased concentration. Loss of sexual inhibitions.

General disinhibition; “social lubricant relaxing self-imposed barriers that tether sociability.”

Personal factors and environmental factors are important: lively company usually leads to boisterous cheerfulness, whereas alcohol taken alone may intensify feelings of loneliness and depression.

[2] *Narcotic phase.* Slurred speech. Staggering gait; impaired motor co-ordination. Impaired reflexes. Diplopia. Drowsiness. Labile mood with wild outbursts. Thinking slowed and superficial; poverty of associations. Increased distractibility. Vertigo.

[3] *Anaesthetic phase.* Stupor; impaired voluntary responses to stimulation. Progressive loss of restraint; self-control undermined. Hostility; irregular or aggressive behaviour; or emotions of hilarity, sadness or self-pity gain the upper hand. Incoherent speech. Breathing slow and stertorous. Hypothermia or hyperthermia. Nausea, vomiting. Pupils contracted or widely dilated.

[4] *Paralytic phase.* Impairment of sensation, movement, and self-protective reflexes. Coma.

[5] *Final phase.* Severe respiratory depression; impaired heart function. Death.

JEKYLL AND HIDE

• The ambiguity inherent in alcohol use has been aptly expressed by Daniel Perrine, who, in *The Chemistry of Mind-Altering Drugs,* looks upon alcohol as “perhaps paradigmatic of all the controversy that has ever arisen about the good and bad features of any drug.” Labelling the opposite aspects “Dr. Alco-Jeckyll” and “Mr. Alco-Hyde,” he presents an excellent and well-documented review of the splitting controversy, of which the following is a brief excerpt:

> *Dr. Alco-Jeckyll*
> Alcohol in small quantities is a natural and innocuous ingredient of many foods, especially fruits and fruit juices. ... Wine is used sacramentally in the Jewish feast of Passover, and an ancient ruling in the Mishnah says that Jews are to drink wine while celebrating Purim until they are unable to distinguish between “Blessed is Mordecai” and “Cursed is Haman” - although with most Jews, this custom is now best honoured in the breach.

In the Christian communion service the exhilarating and consoling effects of alcohol are meant to symbolize the sacramentally effected union with God. A prayer from the period of the *devotion moderna* in the late Middle Ages has the fervent communicant recite "sanguis Christi inebria me [blood of Christ, inebriate me]."

[About the link between alcohol consumption and risk of coronary artery disease:] The most careful study to date ... indicates that alcohol consumed *in moderation* functions as a powerfully effective life-prolonging drug, probably by raising beneficial high-density lipoprotein cholesterol. ... A recent careful review of more than 20 studies concludes that it is the alcohol itself, and not other beverage components, which has a cardio protective effect.

Another benefit of drinking alcohol may be a diminished likelihood of suffering from the common cold. ...

Alcohol consumption can also make one less liable to develop non-insulin-dependent diabetes mellitus. ... In a British study, it was found that, if total mortality from all factors was examined, rather than correlation with any specific disease, then there exists a U-shaped relationship to alcohol consumption: men who drank 8 to 14 drinks per week had the lowest mortality, 30% lower than non-drinkers; the mortality rate then rose as the drinking increased, and those in the highest category, more than 43 drinks per week, had the same mortality as non-drinkers.

Mr. Alco-Hyde

The picture is of course not all rosy; what has been for many a beneficial pleasure has proved for some an enslaving and destructive addiction. In a letter of Paul written much earlier than that of Timothy, he complains that for some of the Christians of Corinth their Eucharist celebrations had degenerated into occasions for drunkenness. ...

Of course, alcoholism is not a disease like measles, with a known infective agent: it is partly genetic, pardy societal, and - like every addiction - pardy psychological. The debate over terminology reflects society's slowly learned realisation that it is counterproductive and inhumane to imprison alcohol abusers as criminals. ... Closely related to the disease concept of alcoholism is the issue whether an alcoholic can ever reassert control and become a moderate drinker. The majority opinion for some time has been no, and this is the position strongly endorsed by AA and other 12-step programs derived from it. ... Like all accepted beliefs in a revisionist world, this ... prevailing dogma has been challenged by therapists who

claim that controlled drinking is possible for some problem drinkers - usually those who are younger, have less severe problems, and do not manifest a withdrawal syndrome when they stop drinking. ...

Recently, Blum claimed to have found evidence that the gene for the D_2 dopamine receptor was associated with an Al allelic gene that was found in 69% of 35 brain samples of alcoholics and was absent in 80% of 35 non-alcoholics. Because the dopamine receptor has been linked strongly with the neural mechanisms for "reward" and behaviour reinforcement, this may indicate a hereditary disposition to alcoholism. Some later studies seem to indicate that in addition to alcoholism, this particular allele of the dopamine gene is associated with a number of other behaviour disorders, such as Tourettes syndrome, attention deficit hyperactivity disorder, and autism.

Other studies have long shown that close relatives of alcoholics have about four times the risk of themselves becoming alcoholic; and the risk is unchanged for children adopted away at birth and raised without knowledge of their biological parents' alcoholism.

[D. M. Perrine, *The Chemistry of Mind-Altering Drugs;* Washington, DC, 1996]

ALCOHOLISM

• Alcoholism is a dependency on alcohol that indicates a spiritual deficiency or a disturbance of physical and mental/ emotional health. Interaction with others is difficult and social behaviour is influenced negatively.

Four phases [after Jelinek]:

1. Pre-alcoholic phase: Urge to conform to habit and usage in own social environment. Feeling of relaxation. In the course of time, an increasing amount is needed to obtain the same feeling of relaxation.
2. Prodromal phase: Intoxication. Entire or partial loss of memory. Surreptitious drinking. Guilt and repentance. Blackouts.
3. Critical phase: Excessive drinking. Loss of control of amount drunk and of oneself. Rationalising and excusing drinking behaviour. Withdrawal, boasting, aggressive behaviour, social isolation. Complaints from lack of proper nutrition and lack of vitamins. Reduced sexual appetite. Regular drinking in the mornings.
4. Chronic phase: Lengthy and frequent drunkenness. Moral degradation,

spiritual decline. Occurrence of alcoholic psychoses such as delirium tremens [oversensitivity to sensory perceptions, distorted images, anguish, restricted awareness], alcoholic delusions [pathological jealousy, delusion of unfaithfulness], psychosis of Korsakoff [incapacity to assimilate new events, disorientation of time and place, memory gaps filled with fabrications],

• Chronic abuse of alcohol can cause serious physical damage to the liver [cirrhosis], kidneys, heart and blood vessels. Resistance to infectious diseases is reduced. Chronic alcoholism in one or both parents often results in inferior offspring. More than ten million Americans are estimated to be alcoholic. An estimated 75% of alcoholics are male, 25% female. Alcoholism is a worldwide phenomenon, but it is most widespread in Ireland, France, Poland, Scandinavia, the United States, and the former Soviet Republics.

> The ally's secret face is terror. The alcohol ally is like slime, slow-moving, growing on you, at first only a fine veneer, like a slug trail. But later more layers collect, until you feel unclean. Feel your steps weighted. Feel every hour of the day a tedious distraction and ordeal.
> The ally likes darkness. It doesn't like to move around a lot. A little feeding. Mostly it likes you, your body, your brain, and your dreams.
> ... Once it's fed and watered, it tells you that you can leave your place among the rocks; that you can arise from your mossy boulders and enter the world of humankind, but you seldom do. At such times the growing weight of the layers of film that the ally has coated over you seems to lighten and soften. The mass becomes gelatinous and pliable, and you feel free.
> Pain is banished or forgotten.
> The world is light. You feel spontaneous. Problems are solvable or ignorable. ... [But] maybe the mass of stuff that the alcohol plant [yeast] has deposited on you begins to harden. Maybe you haven't been able to feed it enough and the veneer has begun to crack. It's like the way the wine itself kills the yeast, its own mother, when the poison is fully formed.
> ... In truth, you are totally alone, and frighteningly alone. ... Oh, it's got you now. By the balls, by the short hairs, got your tit in a wringer, it does. It's got the hold on you. ... It's saying it is time to start paying your dues. It's saying that it is time to start feeling all that pain that has built up on you like a crust. It's saying that it is time to get back to work. To free your

words. To face your children, your spouse, your divorce, the ruin of your life, or perhaps its success. That it is time to deal with the devil you have created. For they are all your creations, all of them. It is your own children that call to you.

... It's a sneaky kind of plant, a patient kind of plant. It is glad to wait, to let you control it. It is always ready to talk or parley and negotiate. But note, the plant is a shrewd negotiator. ... It's a nightmare. It's a slimy well. Every direction is uphill and it's all ice.

The ally says that it is time to deal with the devil you have created. It is your own creation, it is your art. ... It is your genius, only your genius could have created such an elaborate prison for your own self. The ally is telling you you have built enough. Enough locks, enough doors, enough curtains and shades, bars and obstacles. They are all yours to burn.

Look upon it as the devil's firewood, and now you have a shed-full. Call it your "material" in the alchemical sense. So there is still cause for hope, for now you have a practice, you have a discipline, a path - a true path and an everyday path - probably what you were after from the beginning.

[Dale Pendell, *Pharmako/poeia·,* San Francisco, 1995]

EIGHT KINDS OF DRUNKARDS

• Thomas Nashe, in 1592, thought that drunkards could not be limited to one or two kinds only, but instead should be differentiated into eight subtypes.

The first is ape drunk, and he leaps and sings and hollers and danceth for the heavens.

The second is lion drunk, and he flings the pots about the house, calls his hostess whore, breaks the glass windows with his dagger, and is apt to quarrel with any man that speaks to him.

The third is swine drunk - heavy, lumpish, and sleepy, and cries for a little more drink and a few more clothes.

The fourth is sheep drunk, wise in his own conceit when he cannot bring forth a right word.

The fifth is maudlin drunk, when a fellow will weep for kindness in the midst of his ale and kiss you, saying "By God, Captain, I love thee; go thy ways, thou dost not think so often of me as I do of thee. I would, if it pleased God, I could not love thee so well as I do" - and then he puts his finger in his eye and cries.

The sixth is martin drunk, when a man is drunk and drinks himself sober ere he stir.

The seventh is goat drunk, when in his drunkenness he hath no mind but on lechery.

The eighth is fox drunk, when he is crafty drunk as many of the Dutchmen be ...

[cited in Pendell]

DEFICIENCIES DUE TO ALCOHOLISM

• In *Organic Psychiatry,* chapters 12 and 13, Lishman reviews the remarkable range of nervous system disorders that alcohol can produce as well as the multiple hazards, faced by alcoholics, of inadequate intake, poor absorption and special demands made on vitamin reserves for the metabolism of alcohol. A synopsis:

Alcoholism is an important but not an exclusive cause of Wernickes encephalopathy, which represents the acute neuropsychiatric reaction to severe thiamine deficiency. It may be defined as a disorder of acute onset characterised by nystagmus, abducens and conjugate gaze palsies, ataxia of gait, and a global confusional state, occurring together or in various combinations. Wernicke first described the condition in 1881 under the tide of 'polio encephalitis haemorrhagica superior', reporting two cases in chronic alcoholics and one in a patient with persistent vomiting after sulphuric acid poisoning.

... Wernicke's encephalopathy typically declares itself abruptly, though sometimes it may be several days before the full picture is manifest. The commonest presenting features are mental confusion or staggering gait, the latter being observed in 87% of patients, ... varying from inability to stand without support to minor difficulties with heel-toe walking. By contrast intention tremor in the legs or arms was relatively rare. ... The patient may also be aware of ocular abnormalities with complaints of wavering vision or diplopia on looking to the side. This well-known triad of confusion, ataxia and ophthalmoplegia confers a highly characteristic stamp to the syndrome when it appears in full, but all parts are not always seen together.

Other common features include prodromal anorexia, nausea and vomiting. A marked disorder of memory is frequendy in evidence. Special attention

has also been called to lethargy and hypotension. ... The pattern that leads to Wernicke's encephalopathy appears to be steady drinking extending over months or years and coupled with inadequate intake of food. ... Mental abnormalities were observed in 90% of patients, the rest presenting with ataxia and ophthalmoplegia but remaining lucid throughout.

The commonest mental disturbance was a state of *quiet global confusion* with disorientation, apathy and derangement of memory. Many were drowsy, sometimes falling asleep in mid-sentence, and others showed marked indifference and inattention to their surroundings. Against the prevailing view, however, almost all were readily arousable and impairment of consciousness was rarely profound or persistent. In the typical case spontaneous activity and speech were minimal, and remarks irrational and inconsistent. Grasp, awareness and responsiveness were markedly impaired. Misidentifications were extremely common and made without hesitation. Physical and mental fatigability was pronounced, and concentration was difficult for the simplest task.

[Lishman 1987]

Korsakoff's psychosis was first described by the Russian psychiatrist Korsakoff in 1887. The disorder is observed in about 80% of patients with Wernickes encephalopathy. The condition is characterised by defect in recent memory [less so for memory of distant events], inability to learn new information and to form new memories, disorientation in time, confabulation to conceal the memory loss, and emotional changes such as apathy, indifference, and blandness.

• Other nutritional disorders associated with alcoholism include [after Lishman]:

Peripheral neuropathy.

Sometimes symptomless and manifested only by loss of the ankle jerks. In most cases prominent complaints of sensory disturbance occur, usually beginning in the feet with numbness, pins and needles, burning sensations and pain.

Weakness may progress ultimately to foot drop and a high stepping gait, with wasting of the leg muscles and absent knee and ankle reflexes.

Cutaneous sensory loss is most marked peripherally in the hands and feet; on stroking the skin intense hyperaesthesia may be elicited. The calf muscles

are often very tender.

Cerebellar degeneration has ataxia of stance and gait as the principal abnormalities.

Amblyopia may develop in rare cases in alcoholics. More common is dimness of vision, especially for red and green. Acute blindness is more commonly the result of methyl alcohol consumption.

In advanced cases there may be restriction of the visual field, diplopia, hemianopsia, and nystagmus.

TOXIC DISORDERS DUE TO ALCOHOLISM

• Alcohol acts as a depressant of central nervous functioning in a manner similar to that of anaesthetic agents, while seizures, hallucinations and delirium tremens are largely due to alcohol withdrawal.

Pathological intoxication involves abrupt development of irrational combative behaviour, with outbursts of uncontrollable rage and excitement resulting in seriously destructive actions against other persons and property. This condition is in literature referred to as 'mania a potu' or 'acute alcoholic paranoid state'. The outburst is usually of short duration and there is subsequent amnesia for the entire episode.

Alcoholic 'blackout' consists of a "dense amnesia for significant events which have occurred during a drinking episode, and when at the time outward behaviour seemed little disordered. ... The subject may have carried on a conversation and gone through quite elaborate activities, for all of which there is no trace of memory next day. ... [Of 64 alcoholic subjects] some tended to travel long distances as in fugue states. [A quarter of them] had found themselves in strange places with no recollection of how they got there. The wives of two patients claimed that they could tell when a blackout was in progress on account of a glassy stare, belligerent behaviour, or the repetition of questions which showed that experiences were failing to register."

The *abstinence or alcohol withdrawal syndrome* depends on a fall in the level of alcohol circulating within the body. It includes tremors, irritability,

alertness, startling, insomnia, weakness, nausea, vomiting, perspiration, hyper-reflexia, fever, seizures, auditory and visual hallucinations, and delirium tremens.

The *hyperthyroid state* common among chronic alcoholics is thought to be a result rather than a cause of the alcoholism.

Susceptibility to *liver damage* seems to be affected by gender [higher in women], genetically determined tissue types, and general quality of nutrition as well as the quantity of alcohol imbibed. In the case of cirrhosis damaged liver cells are replaced with scar tissue, so that the whole organ eventually contracts to a fraction of its normal size.

The *pancreas,* too, is more likely to be damaged by alcohol in women. Women are also more likely than men to develop *high blood pressure* due to alcohol drinking.

With signs of beginning liver failure, other bodily signs of alcoholism may include skin blemishes [‘spider naevi’], red palms [B vitamins deficiency], swelling of the parotid salivary gland, excessive bruising [capillary fragility], and tightening of tendons in the palms [Dupuytren’s contracture].

DELIRIUM TREMENS

• The term “delirium tremens” was first introduced into pathological literature by the English physician Sutton in 1813. Sutton lays no stress on alcohol as the pathogenic agent or prime factor in the disease. This was first specially insisted upon by Rayer in 1819, who proposed the name “oino-mania” for it, a name derived from *oinos,* Greek for wine. The original name, however, held its ground and is now generally accepted.
Regarding the aetiology of delirium tremens two theories have been proposed. According to the so-called toxaemic theory, long held in France and Germany, the alcohol itself, taken in a single great excess or debauch, is the cause, whilst the other theory has it that the delirium is actually a delirium of inanition, first breaking out when the habitual sot is deprived of his alcohol. Withdrawal of the accustomed stimulus, or poison, results in a tumultuous disturbance of the nervous system’s equilibrium, manifesting

itself as delirium tremens, also known as delirium potatorum [from L. *potare,* to drink] or mania a potu.

• Whereas increasing levels of alcohol suppress REM sleep and the dreaming associated with it, an abrupt rebound is seen on withdrawal with a great excess of REM sleep which may occupy the whole of the sleeping time. Lishman suggests that the vivid hallucinations of delirium tremens may represent a 'spilling over' of the active dream material into waking life.

• The main symptoms of delirium tremens are implied in the name: delirium and tremor ["the shakes"]. These are associated with sleeplessness, sensory hallucinations, increased psychomotor activity, and a state of anxiety or fearfulness ["the jitters"] that keeps up the restlessness.

The presence of autonomic hyperactivity [tachycardia, sweating, flushing or pallor, mild fever] can be of considerable diagnostic importance in pointing towards the condition when the cause of a delirious state is not immediately obvious. The dry lips, coated tongue, and scanty urine are evidence of dehydration.

> Delirium tremens begins with anxiety attacks, increasing confusion, poor sleep [accompanied by frightening dreams], marked sweating, and a profound depression. Autonomic lability, evidenced by diaphoresis and increased pulse rate and temperature, accompanies the delirium and parallels its progress. Mild delirium is usually accompanied by marked diaphoresis, a pulse rate of 100 to 120/min, and a temperature of 37.2 to 37.8° C [99 to 100° F]. Marked delirium with gross disorientation and cognitive disruption, is associated with significant restlessness, a pulse > 120/min, and temperature over 37.8° C.
>
> Initially, fleeting hallucinations and nocturnal illusions that arouse fear and restlessness may occur. Typical of these delirious, confused, and disoriented states is a return to a habitual activity - e.g., the patient frequently imagines that he is back at work and attempts to perform some related activity. Visual hallucinations are frequent and often incite terror. The patient is suggestible to all sensory stimuli and particularly to objects seen in dim light. Vestibular disturbances may cause him to believe that the floor is moving, the walls are falling, or the room is rotating.
>
> As the delirium progresses, a persistent coarse tremor of the hand at rest develops, sometimes extending to the head and trunk. Marked ataxia is present; care must be taken to prevent self-injury.
>
> [Merck Manual]

The onset is usually at night, with restlessness, insomnia and fear. The patient startles at the least sound, has vivid nightmares and wakes repeatedly in panic. ...
Illusions and hallucinations occur in great profusion, principally in the visual modality but also auditory and haptic. Spots on the counterpane may be mistaken for insects, and cracks on the ceiling for snakes. Visual hallucinations typically consist of fleeting, recurrent and changeable images which compulsively hold the patients attention. Rats, snakes and other small animals are said to be typical, and can appear in colourful and vivid forms. They are frequently Lilliputian in size, and invested with rapid ceaseless activity. ... Other hallucinations may be normal in size, such as threatening faces or fantastic scenes depicting terrifying situations. Other hallucinations may be amusing or playful in nature, and recapture some of the bonhomie of the patient and his companions during drinking spells. ...
A marked feature is the intense reality with which the hallucinatory experiences are imbued, and the strong emotional reactions that they produce. Apprehension and fear are typical, but amusement and even jocularity may be seen. Sometimes apprehension and amusement are mixed together in a highly characteristic and paradoxical manner. ...
Speech is usually slurred and with paraphasic errors [form of aphasia in which one word is substituted for another]. In severe examples it may be incoherent and fragmented.
[Lishman 1987]

Well-characterised prodromal or premonitory symptoms are not known. Occasionally it is preceded by a similar prodromal stage of melancholy, though a shorter one, to that which preceded true attacks of insanity. As a rule, the scene opens with the well-known specific hallucinations of vision common to topers. For the most part they see little dark animals [beetles, rats, serpents, and the like] wherever they turn their eyes. But they are also very often troubled in addition by other horrid images, which sometimes assume the form of the devil, sometimes of a policeman, or of great black beasts, and the like.
Magnan considers that the hallucinations of topers are especially characterised by their mobility, as well as by their horrid nature. Delirium tremens is never filled with stiff, fixed visions.
In the hallucinations of the sense of hearing, dreadful sounds predominate, although the patients sometimes hear music, and songs, or other

pleasant things. Besides all this there are a variety of abnormal sensations, apparently due to anomalies of the sense of touch and of cutaneous sensibility. The patients will believe that they are enclosed in a fine net of spun glass, or of some textile fabric. All sorts of little insects are crawling under their skin - these sting and torment them - or they have other delusions of similar kind. At a little later period a peculiar restlessness attacks the voluntary muscles.

The patients are continually making little objecdess movements with their fingers. Lying in bed, they drum continuously with their fingers on the counterpane, reach out all round them with their hands, as if they would move away some small objects. They have always a very unsteady look - a sort of wild appearance. Sometimes they have even nystagmus. But they seldom entirely lose consciousness, or only for a very brief interval. The patients know where they are and who is with them, and for the most part they answer questions correctly. Very often the last scene in the recent debauch, such as a quarrel, etc., is repeated, sometimes half aloud, sometimes in a noisy delirium; and sooner or later, along with increased restlessness, there is more or less fierce mania and fury.

Delirium tremens differs from mere intoxication in this, amongst other things, that the general deportment and aspect of the patient almost always assumes a character of depression. The delirious patient is worried by his hallucinations, and most of his violent acts are done with the object of freeing himself from his tormentors. It is very rare to find the cheerful, hilarious deportment which is characteristic of some forms of mania, and of the earlier stages of intoxication. Cheerful delirium is more commonly met with in patients who suffer from pneumonia or some other febrile affection.

Occasionally we find well-marked delusions as to persecution, in which the devil, the police, or similar objects of terror to common men, play the chief part. It is not uncommon to find the patients inclined to fight those about them, and they are often very mischievous and destructive. These symptoms are usually exacerbated at night, and there is much more dread then than at other times. Complete inability to sleep is also a symptom that is never absent. Another somatic symptom is the tremor, which varies both in extent and intensity, and may even be absent altogether. The face is generally flushed, the conjunctiva injected, and the patient usually perspires very freely. The patient looks very feverish.

The duration of delirium tremens is limited to a few days in the great majority of cases - at the most it extends to a fortnight, whilst the disease

is at its height. There is delirium even in the daytime, it grows worse when twilight begins, and is most severe at night.
[Boehm, in: von Ziemssen 1878]

HALLUCINATIONS

• Hallucinations are commonly of both the visual and auditory varieties, are generally short-lived and become manifest during clear consciousness. Disorientation, confusion and psychomotor over activity are absent, contrary to delirium tremens. Tinnitus is common before, during and after auditory hallucinations. Visual hallucinations are accompanied by visual disturbances such as blurring, flashes, sparks, flames, and spots.
Visual hallucinations are mostly of small animals [rodents and insects] moving rapidly on walls, floor or ceiling. Larger animals or human beings may also be seen, or fleeting half-formed images of faces.

The term *'alcoholic hallucinosis* is sometimes used in a more restricted sense to refer to the relatively rare condition in which verbal auditory hallucinations occur alone, again in a setting of clear consciousness. ... The auditory hallucinations often commence as simple sounds such as buzzing, roaring, or the ringing of bells. Gradually they take on vocal form, usually the voices of friends or enemies who malign, threaten or reproach the patient. The hallucinations may consist of a simple derogatory remark repeated with relentless persistence, or the patient may be assailed by a combination of accusations and admonitions.
He may be discovered arguing angrily with his voices, or he may complain to the police about them. Sometimes the voices command the patient to do things against his will, and their compelling quality may be such that he is driven to a suicide attempt or to some episode of bizarre behaviour. Usually the patient is addressed directly by the voices, but sometimes they may converse with one another about him, referring to him in the third person as in schizophrenia. Secondary delusional interpretations follow upon the hallucinatory experiences, and the patient comes to believe firmly that he is watched, hounded or in danger.
[Lishman 1987]

The main symptoms of *acute alcoholic hallucinosis* are auditory hallucinations. At first the individual usually hears a voice making certain simple

statements. With time, however, the hallucinations usually extend to the voices of several people, all of them critical and reproachful. The individual's innermost private weaknesses, particularly sexual ones, are itemized and discussed, and various horrible punishments are then proposed.

The clanking of chains, the sharpening of knives, the sound of pistol shots, or footsteps approaching in a threatening manner may be heard. Terror- stricken, the individual may scream for help or attempt suicide.

[Coleman 1980]

ALCOHOL AND SEX

• Oral contraceptives slow down the rate at which alcohol is eliminated from the body. Due to its effects upon sex hormones, alcoholism is associated with impaired libido and sexual function, and infertility in both sexes. Women sometimes stop having periods.

Raue [1896] relates the commonly occurring delusion in alcoholics, namely "the false belief in the unfaithfulness of wife," to sexual functioning. "At the beginning of alcoholism," he writes, "the sexual desire is heightened and coitus very often exacted; but later *delayed ejaculation,* as the necessary result of over-indulgence, which makes sexual intercourse a source of annoyance to the wife. Having lost the power of actual reasoning, the degraded man seeks the cause of this in his wife, and jealousy, another insane passion, takes hold of him and destroys all family ties."

Anyone who has ever watched a commercial for beer can tell you that your sex life will improve considerably with drinking. The truth of the matter is that most of the effects of alcohol on sexual functioning are bad. Of course, a person *may feel* more suave and sexy after drinking, and he may more easily convince himself that his sexual prowess is unparalleled. But all too often the mind makes a promise that the body can't keep after a night of heavy drinking. Men, in particular, should consider the meaning of the term "brewer's droop."

As many as 40 to 90% of chronic male drinkers [depending on the study] report reduced sex drive. Chronic drinkers show reduced capacity for penile erection, decreased semen production, and lower sperm counts. In fact, in alcoholic men the testes may actually shrink [a fact generally not presented in beer commercials]. In extreme cases of chronic heavy alcohol abuse among men, a *feminization syndrome* can develop, which involves a

loss of body hair and the development of breast tissue. Although these effects are most often seen in men who drink heavily over a prolonged period, some sexual and reproductive functions are impaired even by lesser intake. For example, evidence is accumulating that consuming two or three drinks per day may decrease sperm counts.
[Kuhn 1998]

SOCIAL INTERACTION

• In Western society, alcohol has the unique distinction of being the only potent pharmacological agent with which self-induced intoxication is socially acceptable. Ergo, alcohol has a social value, either enforced - not going along with social pressure may result in being denied entry into certain circles - or sought after. Alcohol is often portrayed in the context of friendship, sociability, fraternisation, and group spirit. Alcohol commercials capitalise on such sentiments.
Mainstream religious denominations revere the power of wine to build human community, to foster what has been called experiences of "social jollification" which contribute to the communal affirmation basic to all religious communities.
Taking whisky as the prototype of spirits, Judge Sweat in his classic *if-by- whisky* sp eech spoke of whisky as "the oil of conversation, the philosophic wine and ale that is consumed when good fellows get together, that puts a song in their hearts, laughter on their lips and the warm glow of contentment in their eyes."
The Dutch expression "de keel olien" ["to oil the throat"] refers to alcohol facilitating expressing oneself [or to continue babbling]. Being well oiled - Dutch: "in de olie zijn" - amounts to being drunk. Interestingly, the related Swedish word *ol* means 'beer'.
The slight inebriation induced by alcohol used in moderation, writes Fuller, "opens up novel and quite egalitarian modes of social interaction," in addition favouring "variation in ideas" and lively discussions. Alcohol loosens the tongue as much as it "loosens the hold of our normal patterns of waking thought." Private drinking clubs, springing up in every American city in the 1920-30s, were interestingly known as "speakeasies."

Wine promotes the formation of religious groups by providing individuals with a sense of emotional expansiveness. Recent study suggests that Jesus'

ministry promoted just such emotional expansiveness through the commensal sharing of food and wine. This, in turn, became part of Christian worship, just as Judaism and other Mediterranean religions had long recognized wine's symbolic association with spiritual ecstasy. Alcoholic beverages help create the sensation that we have momentarily transcended our ordinary mental and emotional powers.

Whether pronounced or mild, the ecstasy occasioned by wine thus reinforces the conviction that one has suddenly been granted superior intellect and enhanced spiritual well-being. This enthusiasm tends to lessen the inhibitions that might otherwise counter any inclination to go against prevailing community opinion and embrace a novel religious path. The Mormons, for example, passed around cake and wine until it "was the season to speak in tongues." Members of the Brotherhood of the New Life consumed wine for the purpose of achieving "an organic openness to the pure Breath of God," and Summum initiates drink wine, meditate, and expect the Summum Bonum to permeate their very being.

[R.C. Fuller, *Stairways to Heaven: Drugs in American Religious History;* Boulder, 2000]

• Chronic immoderate consumption of alcohol, however, may lead to social annihilation. It violates individual and group boundaries, ferments violence, causes accidents, undermines moral behaviour, and wrecks families. The impact of alcoholic parent[s] upon children is potentially devastating with an increased likelihood of physical and emotional abuse, and a greater prevalence of hyperactivity, truanting, and delinquency.

Aside from interfering with the individual's ability to perform more "socially useful" pursuits, social life narrows to the dimensions of the pub or to the confines of solitary drinking bouts, and relations with non-drinking friends degenerate. With the bottle as sole friend, social jollification is soon replaced by social nullification. Alcohol in excess dissolves individual boundaries, impairs judgement and lessens the accurate interpretation of threatening behaviour of others. Impaired judgement makes it more difficult to resist unwanted sexual advances, with the result that the more alcohol a woman consumes, the higher her chances of being sexually victimised, as one study of more than 3,000 college women found.

• What individuals would never dream of countenancing when alone or cold sober, like taking part in antics, brawls, or even orgies, they might do at social affairs where there is good deal to drink. Individual identity is erased by group identification, since the elements of personality common to all the members of the group [drinking buddies] are the ones that emerge when conscious control is relaxed. Usually negative, these elements have been repressed because of moral and social requirements, and they represent the unadapted and negative factors that everyone harbours in the background of the psyche. A group always represents what is common to its members and never what is individual. As Jung has repeatedly pointed out, each individual must come to terms with the negative side of his own personality; otherwise this is inevitably projected onto the group. [M. Esther Harding, *The T and the 'Not-T,* Princeton, 1973]

ALCOHOL DRUG PICTURE

• An initial mind picture can be deduced from the above data, completed with Schenk's description of the psychological effects of alcohol [Schenk 1955] and with Boehm's characterisation of drunkenness [von Ziemssen 1878]. The picture is arranged in themes.

Expansion
Emotional and social expansion. Bonhomie.

> Body and mind relax; everyday worries are partially forgotten; the drinker becomes cheerful, sociable and expansive, and better disposed both toward himself and others. [S]
> His thinking seems more rapid and accurate than usual; he is carried away by his ideas and the scope of his imagination seems to be enhanced; increased self-assurance is accompanied by a feeling of complacency. [S] He has a more trusting attitude towards strangers and would like to make friends with everyone around him. [S]
> ... In social drinking, the disappearance of self-criticism and self-control are felt as an immense relief. It is this feeling of relief which alone induces light heartedness and relaxation. [S]
> The man expresses his opinions more loudly and more freely, the tendency to put all his feelings into words becomes more and more uncontrollable,

and the cerebral centre, which should control his actions and his words - that "prudent, cautious self-control" which is "wisdoms root," and gives to the sober the stamp of rationality, becomes weaker and weaker. [B]

Repertory:
Affability [pleasant or friendly] to an enemy. Blind intentions towards others.
Cheerful.
Childish behaviour.
Exhilaration.
Vivid, lively fancies.
Smiling.
Sociability.
Sympathetic.

Outpourings
Emotional expansion to the extent of outpourings.

All weaknesses are exposed, and all secrets divulged, without reserve *[in vino veritas];* all hypocrisy ceases. [Allen]
The hidden "I" - the whole man, willingly or unwillingly, comes to light, and the sober spectator and listener often gets unexpected glimpses of those depths of the soul's inner life which the man at another time would most anxiously screen from the gaze of the world around him. [B]

Repertory:
Sweet outpourings of friendship and tender confessions. Sentimental.
Loquacity. Witty.
Revealing secrets.

Disproportionate magnification
Exaltation and glorification of self.

He attributes non-existent gifts to himself and his acquaintances; he over-estimates real facts, believes he can do things with less effort than usual and is ready to put long-contemplated resolves into execution at last. [S] With the very first effects of alcohol, a strictly critical outlook upon objective reality is lost, together with a sense of proportion. [S]

... There is an increased flow of ideas, which are quite worthless, though to the intoxicated person they appear to be of immense significance. The feeling of warmth grows, the face becomes flushed, the eyes bright, the voice loud and the movements unsteady. Boasting, high spirits and unmotivated gaiety are interrupted by transient outbreaks of groundless indignation, anger or exasperation. [S]

... The most burdensome problems and decisions are effortlessly cast aside. No sober, calculating, evaluating inhibition remains to hinder the solution of difficulties. [S]

All the passions press to the front, without any concealment and with exaggerated intensity; love, hatred, revenge, fear, and anger lend their changing colours to the uncontrolled impulses that urge him on. [B]

Repertory:

Boaster, braggart. Pompous, important.

Courageous. Heedless.

Delusion: of wealth. "Very talkative and hilarious, so much so that my friend was altogether a king." [Allen]

Egotism, self-esteem.

Jesting, licentious. Lewdness, obscene songs.

Full of uncontrollable desires and inclinations [even the coarsest].

Laughing, immoderately.

Liar; never speaks the truth, does not know what she is saying. Untruthful. Shameless.

Speech inconsiderate.

Undignified.

Temporary transformation

The weak one grows strong, and the despondent bold. [A]

He is courteous to an enemy, and forgets insults; or he sneers at his friend, and broods revenge. [A]

Rapid changes of mood, exhibiting gaiety, mirthfulness, petulance, anger, moroseness, and melancholy by turns. [A]

At first a feeling of increased strength, and then of debility and weight. [A] Old age descends to the exuberance of youth. [A]

A sulky man becomes social and sympathetic; even the serious philosopher grows merry, lays aside his severity, and enjoys jest and song. [A]

The excitation of the motor centres - the exaggerated tendency to action - urges on the drunken man to purposeless exhibitions of strength, often impelling him to seize hold of the living or lifeless objects which surround him.
... But the overstrained bow is easily broken - often with a sudden snap. [B]

Collapse
Beginning loss of self.

But all the time the drinkers thoughts are not really more profound; his mental capacity is unstable, his judgement unreliable. ... Attacks of melancholy or deep dejection alternate with explosions of drunken joy. The speech becomes slurred, the sense of equilibrium disturbed, the gait unsteady, and all control over the body is lost. ... [S]
Loss of self-criticism and loss of self-control over thought, speech, feelings and actions are the deepest causes [or results] of alcohol addiction. [S]

Repertory:
Cowardice.
Delusion: fear of falling into an abyss [when walking on firm ground in broad daylight].
Fear of misfortune.

Brewer's droop. “The dreaminess is a condition in which neither thought nor imagination acquires power.” [Allen]

Spontaneous combustion
Sudden violent outbursts.

Sudden utterances and unpremeditated actions that burst out without warning. ... Sense of touch dulled, reaction to pain much lower than normal. ... State of total absent-mindedness like that of a sleepwalker. In this condition, he is liable to behave in the most bizarre manner, committing acts of violence as he defends himself against menacing hallucinations, or engaging in theft, arson or indecent assault, of which he retains no subsequent recollection. The seizure ends in sleep, or even in epileptiform convulsions. [S]

Repertory:

Abusive. Brutality. Cruelty. Cursing. Rage, fury, with cursing. Violent. Intolerant of contradiction. Impatience at slightest contradiction.
Fire; wants to set things on fire.
Hardhearted, inexorable. Unfeeling, hardhearted.
Desire to kill.
Malicious.
Mocking his friends.
Want of moral feeling.
"Grudges long since adjusted or forgotten are renewed; he demands revenge or satisfaction, which frequently ends in bloodshed or even murder." [Allen]

Constraint

... The drinker who seeks the solace of the bottle alone in his room is more likely to become melancholy and earnest, gloomy and despondent. In his solitude he is no longer subjected to the suggestion that emanates from a social gathering, whose members experience in common the joy of losing their inhibitions. [S]

Repertory:

Anxiety when alone.
Reserved.

Self-depreciation. Castigation.

Accusation; admonition; reproach; self-criticism.
Menace; persecution; punishment.

The individuals innermost private weaknesses, particularly sexual ones, are itemised and discussed by the invariably critical and reproachfill voices that he hears, and various horrible punishments are then proposed. [S]

Repertory:

Delusion: an enemy is constantly lying in wait to inflict an injury.
Delusion: he is insulted [and abused by his friends].
Delusion: being pursued by murderers; by police; by robbers.
Suicidal disposition.

The Creeps
Feeling of horror or revulsion.
Terrifying dreams/ visions.
Creepy animals.

Repertory:
Restlessness; tossing about in bed.
Restlessness, which he vainly seeks to disguise.
Startling from sleep.
Feeling of vague and unaccountable dread. [Allen]

MATERIA MEDICA ALCOHOLUS

Sources
[1] The symptoms presented in Allen's Encyclopaedia originate from use/abuse of alcohol. "The symptoms have been collected from various sources, and though incorporated with some hesitation, are believed to be reliable."
Alien's symptoms are *without* indication.
[2] Proving by Paul Herscu. Single blind, placebo-controlled proving conducted over a 5-year period [1997-2002] with five distinct groups, five times, at different times of the year.
"There were 114 people who received the vials. Of the people who took the substance, the placebo groups showed no symptoms to speak of. Of the remaining people, there were 25 people who produced symptoms that were above the threshold to be included as probable symptoms of the substance. Of the 25 people, I include eighteen. The other 7 repeat the symptoms of these 18 [7 males, 11 females] and these 18 have enough *overlap* amongst themselves to show a clear emerging pattern."
Proving and clinical symptoms extracted from Paul Herscu, *Provings, with a Proving of Alcoholus,* Vol. 1, New England School of Homeopathy Press, 2002; symptoms indicated by [H]
[3] Louis Klein, Clinical Focus Guide to Homeopathic Remedies. [K]

SYMPTOMS

Mind

« *Exhilaration* - Coming Out of Yourself.

* Loss of Inhibition.

[1] Described in a more physical way, e.g. sense of floating or levitation, or as a sense "that their soul is leaving, or some sort of out of body experience."

[2] Loss of inhibition may be reflected in the behaviour, e.g. as goofing around, laughing a lot or talking a lot, interrupting [either as contradicting or as adding to comments]. Talking is always loud; nature of behaviour is interfering and disruptive. "They [children] are not serious or caring about why it is that they are there, it is all a game to them."

[3] Deception; lying [for the fun of it]; shoplifting or stealing money.

[4] Need to enjoy themselves. Loquacity; "they enjoy talking and do not care if someone is paying attention to them or not. They not only talk but also are often very *loud,* so as to drown out all surrounding discussions. Enjoy playing *practical jokes.* "This is the immature jokester who quickly becomes annoying.

[5] Rage. "Some of the older adolescent will tell their parents whatever is on their minds, even hurtful things, without pause. Like the adults, they will not care how it is that they impact the parent with their comments [due to acting without forethought or afterthought]." May become aggressive and *full of rage,* due to being "so outside themselves that when they do things that are annoying and others try to reign them, they strike out. It is almost an autonomic response. It is not premeditated anger." [H]

Sociability leading to s
glorification.
Impairment of judgeme
overstepping borders,
crossing limits, breakin
taboos. Social alienatio
Self-castigation; self-
reproach;
punishment.
The creeps.
Neurological
degeneration.

= *Boasting.*

Uncontrollable desires.
'Big' unrealistic projects.
I'm the centre of the universe.
Self absorbed egotism.
Compensation of low self esteem, [KJ

~ *Affability.*
'With enemies.'
Lacks jealousy or emotion.
Loss of personality and ambition.
Lack of character, superficial.

> 'When something happens to an *Alcoholus* patient where there should be a strong response or repulsing action [particularly to a person], he or she responds in a very light and smiling way as if inviting in the disturbing force. The outward expression will be one of affability but the response means that they swallow the injury that increases their addiction or addictive tendencies. ... The main place I see affability in the remedies *Alcoholus* [and Hypothalamus] is in the situation of confrontation by a partner who has had an extramarital relationship. These patients respond in a truly accepting fashion without intense jealousy or even suppressed anger.' [K]

== *Confusion.*
"One of the most consistent symptoms for the remedy." Misunderstanding of sensory cues.
Forgetfulness.

> "Things that happen around them will be misconstrued. They may not understand another person's intention, be it a parent, teacher, sibling or friend. ... They do poorly at school. They are diagnosed with attention problems, with poor impulse control and/or hyperactivity. Reading is difficult, retaining what they have read is even more challenging. Learning new concepts is difficult. They constantly make mistakes in their schoolwork, esp. in spelling, writing and speaking." [H]

Gross motor incoordination; awkwardness; tendency to have accidents. Reflexes sluggish.

« Wanting to be alone, either due to sensory acuity or to confusion.
May be accompanied by sadness or depression.

> "There is a clear sense that nothing works out, nothing will ever work out, and they do not know why. While depression is a common characteristic of the remedy, it is not a strong symptom for most. In other words, even

the child that has been harassed at school, made fun of in the playground, a child that feels sad, will often be able to be gotten out of that mood by taking him to the movies or taking her out for an ice cream.
I think this is because they are not all that solid. As a result, it is easy for them to fall into sadness but also easy to get out of their depressions. It is the same with the adults in the short term. Call them, take them out to dinner and they are in a good mood." [H]

= Desire for stimulation.

"A very consistent symptom in the adult and the child. ... They want and want and want. This extends all the way into adulthood where they seek stimulants like coffee and eventually other drugs that, initially at least, have a stimulating effect. They are looking for a 'rush,' for some form of stimuli because when they get that, they feel they can function better." [H]

= Addiction.
Alcohol, food, gambling.
Workaholism.
Addiction, overwhelming and precluding personality.
Never satiated. [K]

Generals [H]
» Right-sidedness [often very marked].
= Pains tend to be sharp and stitching.
= Dryness.
= "Tingling, waves, vibrations are words that many adults needing this remedy will use."

Appetite & Thirst
= Desire for pepper, mustard, and other heating articles.
=> Craving for sweets, coffee, spicy, salt, and meat. [H]
= Loss of appetite. Aversion to food.
— Thirst often excessive; often none.
= Great thirst for water, most especially for cold water. [H]

Sleep

<= Lethargic; deep; death-like.

= Fully developed insomnia; the patient tosses from side to side during nearly the whole night, getting only broken snatches of sleep, and these almost always attended with disturbing, and often with frightful dreams.

« Overpowering sleepiness. Resdess sleep [due to much noise in the dreams]. [H]

= *Dreams* [H]

Accidents [car accidents, breaking things, etc.].

Destruction [houses breaking, furniture moving, cars crashing].

Water [large bodies of water such as ocean or great lakes; nature of dream unpleasant].

Being lost [at sea; in city; taken wrong road in car].

Erotic.

About people of the distant past.

Vivid [clear story, great amount of detail, in colour with many hues], will be retold as vividly.

Suspense and deception.

Temperature

= Sensitiveness to the fresh air; shudder and frost.

= Great inclination to sweat.

= Heat and flushing. “The person may be warm-blooded in general, feeling confined, irritable, and trapped in a warm room and wanting cool air and feeling better in the cool outside air.” [H]

Vascular

= Redness of nose and cheeks.

«· Face red and swollen; bloated and heated; red in spots, mottled.

= Veins of neck swollen.

= Sensation of warmth in chest.

«■» Increased warmth; then coldness.

Neurologic

= Convulsions, sometimes like chorea.

~ Convulsions, with a peculiar sensation in head, as of wind, or a painful drawing, as if something twisted and turned in the head.

<- Convulsions often begin in one extremity; are often confined to one side;

sometimes the head is drawn backward, the back bent, the teeth clenched, and eyes distorted.

« Epileptic attacks, generally coming on while standing; sometimes while sitting or lying.

** The whole body trembles, commonly after exertion.

= Twitchings or jerking in muscles on sitting or lying, not in standing, especially on changing position; almost always in lower extremities.

“ Sensation benumbed; anaesthesia; first in tips of fingers or toes; often spreads to the back of feet or shin, or back of hands. This numbness is usually superficial; sensitive to deep pressure; sometimes sensitiveness of whole body blunted.

“ Limbs numb, as if paralyzed, and again extremely sensitive to touch and motion; more sensitive to a light touch than to a firm grasp.

= Sudden trembling in tongue and lips. Convulsive motions of the tongue, causing stammering and inarticulate speech.

Sensory

=> Perception of light lessened.

= Aversion to light.

=> Objects flicker and become dim, indistinct; cannot read or write.

= Flickering before vision, as if a veil suddenly drawn before the eyes, which at last becomes thick and black, especially on exerting vision.

== Sparks before the eyes.

= Flashes of light before eyes.

= Muscae volitantes, in clouds, before the eyes [chronic].

Of all the organs of sense, the eye is the most frequently attacked. Galezowski [1868] generally found well-developed dyschromatopsia in alcoholic patients. Of yellowish-green and bluish-green they could only distinguish the green; they confounded violet with red, and brown with grey. Magnan has repeatedly observed the same. Besides this, amblyopia and amaurosis occur in various degrees. Daguenet [1869] investigated these conditions still more carefully. He found atrophy of the optic nerve in many cases of disordered vision.

The sudden commencement of weakened sight appeared very remarkable to him; everything round the patient seemed in a mist, so that even persons ten paces off could not be recognised, and so on. The patients saw better on dull days than on bright ones. They could not be trusted as to colours.

The tint of well-known people seemed altered to them; sometimes they confounded gold coins with silver ones. There were very few objective symptoms with all this. The rather dilated pupils acted badly.
[Boehm; in: von Ziemssen 1878]

» Eyes [< right eye]; sharp pains; heat and dryness; visual acuity; *visual distortions esp. at night,* accommodation slow, leading to difficulties while driving at night. [H]

« Sense of hearing acute or blunted.
= Noises in the ears - roaring, ringing, buzzing, rushing - after spasms; during vertigo; during headache; noises < when lying down and in the quietude of the night.

-» Illusions of sense of taste.
«< Strong sense of taste, "which can be a rich experience for those that love tasty foods but can be very limiting to the child that is averse to food because everything tastes too strong." [H]
= Illusions of sense of smell.
Hallucinations of smell are not common; but the patient may imagine that his room is full of the vapours of sulphur, or suppose that the devil has defiled his bed, and that this smells as the devil is supposed to do. [Hempel]

— Sensory acuity. [H]
* *Entranced* by sensory stimulation; enjoyment of sensory world. "Be it movies, plays, music or books read aloud, they are transported right into the story."
OR: Disturbed sensory integration. "Instead of being transported into the beauty of it, they are profoundly disturbed by smells, as of foods, vomiting or gagging when entering restaurants. Noise bothers them, so that they cover their ears, become confused and at times aggressive from the sensory overload and confusion it causes.

Alimentary canal
= Soreness felt from throat down to stomach after swallowing solid food, or very hot or cold drinks.
=> Sensation of swelling or fullness in throat, > breathing cool air. [H]

<·> Pains sharp and worse on the right side. [H]
= Sensation as if something lodged in the oesophagus.
— Hawking causes vomiting.
= Eructations sour, foul, like rotten eggs.
= Vomiting in the morning hours of a tough mucus, like white of egg; stringy, with flow of saliva.
=» Vomiting after eating or drinking.
=· Peculiar burning sensation in stomach, best allayed by water.
== Heartburn, after eating, taking the appetite away. "There is sometimes regurgitation of food, along with soreness in the throat. During this time, there is also gas and bloating in the abdomen." [H]
= Oppression in the pit of the stomach, that is often aggravated to intense anxiety.

> Alcohol is homeopathic to many forms of irritation and congestion of the stomach; it is a favourite remedy against dyspepsia from debility; it relieves many forms of nausea and vomiting, and may prove homeopathic to the morning vomiting of pregnant women. It is also homeopathic to acidity of the stomach and water brash. [Peters]

«■ Gas and bloating [abdomen], similar to *Lycopodium,* but differing in "that the *Lycopodium* during this time will want warm drinks, whereas the *Alcoholus* will prefer cold." [H]
— Tendency to constipation, with strong ineffectual urge and discomfort, similar to *Nux-v.* "Again, the desire for cold drinks in *Alcoholus* and the desire for warm drinks in *Nux vomica* helps to tell them apart." [H]

Genitourinary [H]
== Frequent urge to urinate; adults may be waking up at night to urinate.
=» Heightened sexual desire [both sexes].
= Swelling of prostate.
= Menopausal symptoms; hot flashes; menses irregular; sexual intercourse painful due to dryness of vagina.
= Premenstrual symptoms similar to *Lycopodium* [irritability, weepiness, sadness, withdrawn feeling; swelling of breasts, tender to touch]. "Interestingly enough, when the menses is late in a woman needing *Alcoholus,* she may dream much more than usual."

Dermatologic

» Dry skin. Skin does not heal readily.

■> The least injury to the skin, the prick of a lancet, an inflamed spot, especially eruptions and burnt places, suppurate with inconceivable rapidity, and degenerate into ulcers, which not only affect the soft parts, but the bones as well, and smell offensively.

= Acne rosacea.

= Large, indolent, blue-looking boils or carbuncles.

Respiratory

= Allergic complaints very common; e.g., hay fever, repeated bronchitis, and esp. asthma. Asthma < lying down, > sitting up, being quiet, open air, and cool air. Asthma < heat and from allergens like pollen, smoke or animal dander. Symptoms consist mostly of swelling, congestion and constriction, not so much of coughing. [H]

=> Dyspnoea on ascending. [K]

Other locals [H]

» Right-sided headache; sharp shooting pain; accompanied by heat and flushing sensation, heaviness [as if full of fluid, or too heavy to hold up head], or tingling.

= Ears; otitis media with sharp pains, esp. in right ear.

= Nose; tingling and itching inside the nose, frequent sneezing; *congestion of nose in a warm room,* > open air.

~ Sinus problems - congestion and pain; < bending, > spicy food; yellow, bloody discharge. [K]

Some repertory rubrics

A selection of rubrics listed by Herscu as second grade [“proven by a few people in seen in practise”].

=» Concentration difficult while driving.

= Confusion of mind > excitement.

= Delusion of being insulted.

<= Hardhearted, inexorable.

« Laughing immoderately.

» Playing, desire to play.

= Vision confused, at night from artificial light.
= Mouth, sensation of dryness; with thirst.
= Respiration difficult, as from smoke.
== Sleepiness while driving car.

ALCOHOLUS AND FUNGI

= Many fungus remedies have a “sensation as if drunk,” which expresses the removal of restraints on their behaviour; an uninhibited state during which the person ventures into bold enterprises. It will therefore not come as a surprise that the fungus with the largest drug picture, *Agaricus,* and Alcoholus have a lot in common, such as:

== Childish behaviour.
= Difficult concentration when studying, reading, etc.
== Courageous [and the opposite: Cowardice].
■> Heedless.
= Desire to kill.
=» Always too late. [Time optimist.]
= Revealing secrets.
=» Singing.
= Sociability.
= Incoherent speech; stammering speech.
=· Rush of thoughts, flow of ideas.
= Defective accommodation.
<■ Awkwardness; impaired coordination; stumbling when walking.
= Sensation of [muscular] strength.

IGNIS ALCOHOLIS

Ignis in the Kingdom Fungi?

As representing the principal element of Fire, Ignis Alcoholis can fit into various remedy groups. Liable to catch fire and burn, alcohol relates to other combustible substances, e.g., hydrogen, phosphorus and sulphur. It can be associated also with the group of Imponderabilia, along with such weightless relatives as light [Luna, Sol], electricity [Electricitas], magnetism [Magnetis polus australis, etc.], storm [Tempestas], and Colour [Spectrum].

It may seem a bit odd to link Ignis with Fungi, yet there are several good reasons for doing so:

- The remedy Ignis Alcoholis is prepared by burning pure alcohol.
- The remedies Ignis and Alcoholus display similar symptoms.
- Since Alcoholus and many fungus remedies have much in common, it may be expected that, by extension, the same is true for Ignis and fungus remedies.
- The ambivalence of fire as being either creative or destructive corresponds with the ambivalence of fungi [e.g., mycorrhizal fungi versus parasitic or dry rot fungi],
- The first concept of fire ecology includes the preparation by fire of the soil for seeding by making nutrients more available for plant uptake. Saprophytic fungi function similarly as primary recyclers of nutrients by releasing compound-bound minerals that would be otherwise unavailable for new generations of life.
- Restoration of ecosystems perturbed by fire occurs with the help of pioneering fungi initiating a new ecological succession cycle. Fire stimulates the germination of fungal spores, lying dormant in the soil, as well as triggering the sclerotia [resting stage] of some species to produce fruiting bodies. As fire was associated with rebirth and renewal in mythology, so fire is now recognized as an instrument of change and a catalyst for promoting biological diversity and healthy ecosystems.
- Suppression of fire in its role as a shaper, cleanser and vitaliser of nature, i.e. depriving ecosystems of fire, leads to accumulation of dead plant material and consequently allows [wood] decay fungi to increase or spread irrepressibly, a fungal response that further disrupts the forest

environment. The 20th-cenrury rush to put fires out provides new, mainly competition-free resources and substrates for fungi.

- Certain fungi, e.g. 'fire cups' in the order Pezizales, emerge en masse in burnt areas or get a boost from fire, either because they love fire ['pyrophilous' fungi] or thrive on carbon ['carbonicolous' fungi]. Such fungi are collectively called 'fireplace' or phoenicoid fungi, after the mythical bird Phoenix that burned itself every 500 years or so and rose rejuvenated from its ashes.
- *Both fire and fungi are transformers.*
- Symbolically, fire is either divine or demonic. In the drug picture of several macroscopic fungi, e.g., Psilocybe and Amanita pantherina, both elements are evident.
- Fire water shares its symbolism of conjunction of opposites with fungi, the latter being earth-bound, water-logged organisms favouring damp places deprived of sunlight and at the same time manifesting unseen energy, transcendence, illumination and enlightenment.
- Claviceps purpurea intoxication, or ergotism, was called St Anthony's Fire or Holy Fire *[sacer ignis}.* Fungi such as Ustilago maydis and Phellinus nigricans resemble a mass of charred tissue. Certain polypores or puffballs were formerly used to kindle fire.
- Moulds like Fusarium spp. and Mucor mucedo have a predilection to colonise the skin of burn victims.
- Burning pains are common pain sensations in fungus remedies.

Conjunction of opposites

Aqua vitae, or life-water, is fire water, i.e. a symbol of the conjunction of opposites, where the active, masculine fire-principle and the passive, feminine water-principle come together in a fluid and shifting relationship that veers between creation and destruction. Gaston Bachelard says that *eau-de-vie* is also *eau-de-feu,* water that burns the tongue and flames up at the slightest spark, and that, when alcohol burns, "it seems as if the 'female' water, losing all shame, frenziedly gives herself to her master, fire."

Dale Pendell regards alcohol as "a liaison, mediating between water and oil, between the inorganic world and the organic, between carbohydrates and hydrocarbons."

Elaborating on Bachelard's concept, Chevalier and Gheerbrant write that

alcohol "symbolizes both the flame of life and the spark of creative genius. Not only does it stimulate the latent within the spirit, but also it actually creates. ... The ambivalence of alcohol betrays its twofold origin." And, quoting Bachelard once more: "The alcohol of Hoffmann is the alcohol which flames up; it is marked by the wholly qualitative and masculine sign of fire. The alcohol of Poe is the alcohol that submerges and brings forgetfulness and death; it is the wholly quantitative and feminine sign of water." Alcoholism, therefore, may be reckoned an attempt at *conjunctio* or unification. "The reconciliation of the separate sexes in an eternal synthesis, after the platonic legend.

In Jungian psychology, this conjunction has a purely psychological meaning within the psyche of one individual, as a counterpart of and a substitute for the synthesis achieved through platonic love between two different beings. Mystic longing has its being in the profound yearning for absolute unity of all that is particularised and separate. In conjunction, then, lies the only possibility of supreme peace and rest. The union of heaven and earth in primitive, astrobiological religions is a symbol of conjunction, as is also the legendary marriage of the princess with the prince who has rescued her." [Cirlot, *A Dictionary of Symbols;* New York, 1995]

Symbolism of Fire

- Transformation; transmutation; regeneration; renewal.
- Resurrection symbolism of fire personified by the phoenix and salamander.
- Purification; baptism by fire; destruction of the forces of evil/ darkness; fireworks and bonfires to frighten/drive out demons.
- Religious fervour; spiritual ardour; divine revelation; a flaming heart [emblem of saints].
- Truth and knowledge as consumers of lies, ignorance, illusion and death.
- Continuity of traditional ideals: preservation of domestic fires, undying Olympic flame. Passing the torch.
- Vitality; vital heat; physical energy; life giving [sun]; ambition, drive [fire in one's belly].
- Animal passion; sexual passion. [The ancient technique of fire-making consisted of up and down friction, the image of the sexual act.]
- Burning emotions [love, hate, desire, determination].
- Danger; anger; hot-tempered; ferocity; speed; spreading like wildfire.

- Destruction; desire to annihilate time and to bring all things to their end.
- Symbols of fire: upward-pointing triangle, lion's mane, hair, sharp weapons, fir tree, and azalea.

MATERIA MEDICA IGNIS ALCOHOLIS Ignis-alc.

Sources

= Proving by Nuala Eising; 13 provers [9 females, 4 males; 2 on placebo]; 30c; 1997.

SYMPTOMS

Themes

- IMPURITY [5 pr.]

POSSESSED - EVIL

·» I can't stand red [previously a favourite colour]. It reminds me of evil - the devil, etc.

= Suddenly, I saw the rear lights [of the car in front] as the inverted horns of Satan - I was looking at pure evil. I felt possessed.

= Thoughts about Right/Wrong, Good/Evil, Light/Dark. Aware of all the evil in the world. Feel we are too slack on it. Feel I really need to clean up my act. Should start with my immediate surroundings. The expression 'Cleanliness is next to Godliness' is in my head at the moment.

·» Important to avoid anything that throws you into the dark. Alcohol has that effect. I cannot tolerate alcohol since starting this proving. I feel possessed if I drink. I will wake during the night feeling contaminated, like I have put something inside me which is evil. A desire to avoid people and situations which are unclean or untogether. It seems as if these things can rub off on you. Purity is so important - avoid contamination at all costs.
Dream: A massive invasion of evil looking bats with cats faces, coming out of the sky and onto the ground.

DIRTY

= I feel like I'm standing way above the earth looking down on a cesspool

of ignorance and vulgarity, a stab city market place of vice, corruption and perversion. I cannot be part of it - I do not know how to exist in it. ... I cannot find anyplace to land without feeling dirty.

CONTAMINATED

■» [After entering a pub]. I felt I had come into a den of iniquity in the bowels of the earth. I was watching the backs of people sitting at the bar with their pints of Guinness and thinking 'Those poor, unfortunate, lost souls - they are beyond redemption.' I felt I had to get out of the place quickly before I got contaminated. ... Had to get home and have a bath and try to clean it off.

— Avoiding people who I feel will contaminate me, i.e. people who are too emotional, slow, dirty, over-needy, untogether in any way.

= To maintain my own purity, I feel the need to avoid contamination from others. It is as if it can rub off. It feels as if my spirit needs a clean, uncluttered space and this can get affected by people who lack a sense of purpose and direction and who go for escapism.

POISONED

« Became terrified of putting salt on food. I've always loved salt and used a lot of it. Felt that salt would poison me, burn my insides, and shrivel my kidneys.

= Feel that restaurant-prepared food is too salty and will harm me. Have to drink large amounts - 2 litres daily of fizzy water - to counteract the possible effect of salt hidden in food.

= Felt that tea is also poisoning me, but am still drinking it; however, only two cups daily instead of 6 or 8.

= Fear being poisoned by carbon monoxide fumes from fire.

Great sensitivity to fumes - from the fire, of bleach, diesel, petrol, and cheap perfumes - nausea. Instant migraine from fumes. Felt faint in petrol station.

« PURIFICATION - CLEANLINESS - CLARITY [7 pr.]

PURIFICATION

= Purification is a word that has come forcefully into my vocabulary.

= Feel that everyone needs to cry for the world's suffering - to cure the disease of the world. Tears of purification to cure the world's ills.

= Have stopped seeing a lot of people to clear my life of dross.

=> Noticing how clean everything becomes in the rain - purification. Wash away the ills and sins of the world.

= Purity and virginity are of great importance. A great desire to be again a virgin.

— Love being outside in any weather. Love the space and movement. Can feel the purifying effects of rain, the purifying effects of wind and of the sun. ... I have noticed that I have lost my fear of thunderstorms. Contrary to what I normally do, I went out in a couple of thunderstorms recently and felt extremely exhilarated, watching the lightening and listening to the thunder.

CLEANING UP

= I really need to clean up my act.

<=* Sudden overcome with a desire for the place [kitchen of sister's house] to be absolutely spotless and perfect. So I started cleaning, scrubbed the place from top to bottom. Got loads of bleach - obliterate all dirt and possibilities of dirt.

= Am really enjoying cleaning and scrubbing my house in keeping with my new beginning.

= Got into a cleaning mood and there was war on spiders. Wanted to have everything shining.

<= Feel like I'm waging war on dirt.

= Great urge to remove a large, hanging crystal from the bottom of a chandelier and wash and polish it lovingly.

= A really nice feeling of cleanliness and emptiness in my head, instead of having it cluttered up with brains.

= Notice that I can alternate between being very pernickety about order and cleanliness when my energy is good to not giving a damn about anything when I am exhausted.

PERFECTION

= Compulsion to completely renovate my whole house. Great desire to have everything spotless, spacious and aesthetically pleasing and totally perfect.

= I love lighting fires - sitting by the fire, watching the flames. I've lots of red, orange and black in the room. It feels like the perfection of my heart.

CLARITY

» Feeling of no brain in my head - brain gone - feel clear.

== Asked a lot of questions to make things clear [at a meeting]. I wanted things done and simple and was very impatient with complexities. Spent a lot of time cleaning up things that had been said at a previous meeting.

= Seeing other people very clearly - their states and motivations.

= Experiencing sharp, clear memories of past events in my life.

= Very clear-headed. See things very clearly. Absolutely no doubt about my rightness.

= *A fresh start and a brand-new day* [4 pr.]

= Feeling of having been in some dark place during the night and being born again to a new day - a new beginning.

» There was snow today. It was beautiful, like a fresh start, a new world, all white and beautiful. I have amazing energy. The snow is making me want to start again.

== Woke this morning feeling brilliant and new with the words 'It's a new day dawning' in my head.

» Every morning I wake with excitement and wonder. Have watched the dawn breaking a couple of times and each day is like a new beginning - a new day dawning.

«· Aversion/ cruelty to cats [4 pr.]

» A total aversion to cats. I see cats as disgusting, rotten, evil creatures. ... Decided to dispose of one of them. Put him over the wall of a nunnery a few miles away.

= My two cats have run away. I'm delighted - I couldn't stand them being around. I was seeing them as disgusting, dirty creatures.

= Prover was overheard plotting how to get rid of her four cats.

— Found the cats had been at the rubbish. Picked up one of them and threw him. He hit his head on a wall - I found this funny.

== Dream: My house was overrun by cats

<·» Intolerance [4 pr.]

CROWDS AND CLOSED SPACES

= Very claustrophobic in crowds and closed spaces. ... Could feel the whole place closing in on me. Felt like screaming and screaming, but controlled myself.

= More need for space around me. Avoiding crowds. Claustrophobic in small places. Feeling of not being able to breathe.

CLINGY, NEEDY PEOPLE

<= Can't stand people clinging on to me or being needy. I feel I'm being smothered. Can't stand anything too close to me.

= 'm very critical of people, especially needy people - I find them very irritating. ... I only want to be around people who are like myself.

= Can't stand my daughter's weepiness or neediness. I have a really strong temper.

=» Have great difficulty relating to certain persons, especially people who are resentful or have emotional responses to things. I don't understand where they are coming from. It's like a moral or spiritual superiority - a feeling I'm above all this. [Someone] overreacted in an emotional manner. I felt contemptuous of her. I could not tolerate her overt display of emotions.

LOUD PEOPLE

<· Can't stand being around people who are loud and aggressive. ... People drinking alcohol, laughing, etc. is beyond me. Can't handle a crowded place.

SURROUNDED BY PEOPLE

« While standing at a bar was surrounded by people - I found this very difficult to handle [very unusual]. Also unusual was that I was finding the smoke in the bar very annoying.

HINDRANCE - SLOWNESS

«· I get extremely angry if anything gets in my way or inhibits me in any way. Very angry if I watch someone doing anything in a slow or inefficient manner. Feel like grabbing it and doing it myself. I find myself being very direct.

= Very impatient - wants things to move faster.

« The Instigator - setting things afire.

'Ignis [fire alcohol] is one of the remedies for someone who is in a more constantly aggressive phase of alcoholism. ... In this more active stage of alcoholism, we see selfishness accentuated. Drinking alcohol excessively blurs judgement and can create indifference with loss of any moral feeling. It can bring a total loss of inhibition, leading to shamelessness and violent recalcitrant behaviour. The latter stage has many similarities to the mania and delirium we may see in Solanaceae remedies like *Hyoscyamus* and *Stramonium.*

Sudden expressions of violence, shamelessness, carphologia, and other overt expressions are common in this plant family, as we may see in *Alcoholus* and *Ignis. ...* Interestingly, in the proving of *Ignis* there was much ideation and issues about the devil. ... The underlying theme of *Ignis* is *"instigating* change or disruption." Although an aspect of this quality or theme is in the remedy *Alcoholus,* it is much stronger in *Ignis.*

Ignis is a remedy that could be used for someone who is in a profession or position where they challenge others and feel they have to play "the devil's advocate." The *Ignis* patient can feel a zealous imperative to "cleanse" the world. In children needing the remedy *Ignis,* I have seen very disruptive behaviour similar to *Tuberculinum.*

The child is the main instigator of problems in their family or school environment. The parents may even describe them using expressions like, "he or she is like the devil" or, "he or she is like Damian." In the interview, the child will whine and be disruptive. In *Alcoholus,* there is a more affable and accepting attitude.' [Louis Klein]

= Dreams of silver [old silver; silver fish; great expanse of silver sea]. [2 pr.]

Generals

= Feeling of great heat - locally, in face, with redness, or generally - after eating. Accompanied by weakness/ exhaustion. Walking in open air >. [3 provers]

= Energy goes up and down in sudden bursts [1 pr.] or sudden sinking of strength - faint feeling, trembling of hands and legs, empty feeling in stomach, sweating, and sudden need for food [3pr.].

= Morning on waking < [heaviness head; swelling under eyes; constriction external throat; nausea; sleepiness]. [5 provers]

«> Burns.

Severe facial burns on a woman who had a can of petrol catch fire and blow up in her face. A few days later she took Ignis Alcoholis 30c. Her facial symptoms immediately flared up with the pain of the initial burn and also went extremely red. It then started to clear, and ten days later there was no trace of the burn left on her face.

Baby had boiling water accidentally spilled on her face. Ignis Alcoholis 30c cured quickly and completely.

A number of severe sunburn cases were cured quickly with Ignis Alcoholis 30c.

Locals

= Sensation of dryness in sockets [eyes].
== Profuse lachrymation with burning pain in eyes.
= Burning pain in nose as from pepper.
= Respiration difficult after eating.
= Pain left side chest extending to left shoulder.

Symptoms and citations from Nuala Eising, Amber and Fire Provings, The Burren School of Homeopathy, 1998.

Ignis compared with Agaricus, Bovista and Secale [Claviceps]

= Activity, desires.	I	A
= Ambition increased.	I	B
=> Anxiety with fear.	I	B C
= Audacity.	I	A
« Censorious.	I	A
= Company, aversion to.	I	A B C
« Contemptuous.	I	C
■» Courageous.	I	A B
« Delusions, is a great person.	I	A
= Delusions, he is light [incorporeal].	I	A
=» Egotism.	I	A
= Exhilaration.	I	A B C
=» Fear of evil.		I A C
= Fear of suffocation.	I	A
<·> Hurry.	I	B
= Jesting, aversion to.	I	B
= Naive.	I	B

= Occupation amel. I A
=· Plans, making many plans. I A
= Throwing things around. I A
= Head, Itching of scalp. I AB
— Head, Pain pressing inward. I B
= Eye, Pain drawing backward, eyeballs. I AB
= Nose, Discharge, copious, + watery. I AB
« Stomach, Clothing disturbs. I B
— Stomach, Distension after eating. I A
= Abdomen, Distension after eating. I A
<= Bladder, Urging to urinate, sudden. I A B
= Female, Menses copious, + protracted. I A BC
~ Chest, Palpitation of heart, tumultuous. I A C
== Back, Pain, Lumbar region, motion amel. I A
<= Sleep, Falling asleep after eating. I B
~ Sleep, Short. I A B C
<■ Dreams, Death, she is dying. I B
=» Perspiration, Anxiety, during. I B
= Perspiration, Odour, onions. I B
= Generals, Air, open amel. + desire for. I B C
= Generals, Burns. I A C
= Generals, Clothing, pressure of clothing agg. I B C
= Generals, Exertion, physical amel. I A
■» Generals, Food and drinks, alcoholic drinks agg. I A B C
= Generals, Heat, flushes of. I A B C
= Generals, Motion amel. I A B
= Generals, Strength, sensation of. I A B
=» Generals, Sun, sunburn. I A B

PHYLUM ZYGOMYCOTA

Characterized by a well-developed mycelium and by the formation of sexual, thick-walled zygospores and asexual, non-swimming sporangiospores. Most Trichomycetes are parasites or commensals inside the guts of living arthropods. The order Entomophthorales contains species pathogenic to humans, causing zygomycosis, as well as species that parasitize and kill various insects. The species *Entomophthora muscae* infects the common housefly. Its mycelium grows within the host's body, so that infected flies are often found attached by hyphae to window panes in late summer or fall, their body surrounded by a halo of whitish spores. These spores can infect other unsuspecting flies that come to pay their last respects.

Dung-inhabiting Mucorales belong primarily to the genus *Pilobolus.* These organisms grow very rapidly and are among the first fungi to fruit in the extended succession that occurs on dung. Pilobolus spp. have a unique phototropic dispersal mechanism. It consists of a light-sensitive 'retina' and a pressurized cell that explodes and so catapults the spores away to a distance of up to two metres in the direction of a light source. [Light ensures space and thus a landing platform away from the dung and onto the prospective diet of herbivorous mammals, which serve as vectors.]

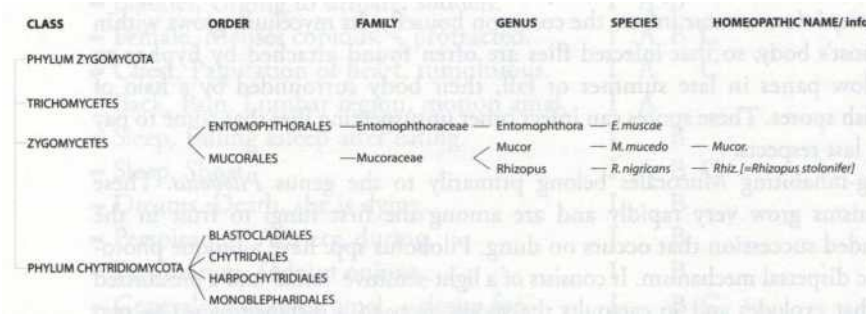
The Zygomycetes form a diverse group, some of them being common and fast growing, primary colonizers of carbon-containing substrates. Black bread mould, Rhizopus nigricans, is a well-known representative of the Zygomycetes in the order Mucorales. Some Mucorales, eg Mucor oryzae, are used to prepare fermented soybean foods and the rice beverage *sake* in t he Orient. A few species of Mucorales exist in symbiotic associations with the roots of such economically important crop plants as corn and soybeans.

CLASS ZYGOMYCETES

I. ORDER MUCORALES

I A. FAMILY MUCORACEAE

Mucor mucedo



MUCOR MUCEDO **Mucor.**

Scientific name Mucor mucedo L.: Fr. 1821.
Common name Black pin-mould.
Family Mucoraceae.

KEYS

- Saprophytic mould.
- Colonizes moist places but is also very drought tolerant.
- Rapid growth.
- Carbohydrates.
- Overgrows and inhibits other fungi; doesn't like competition.
- Intricate courtship.
- Allergenic reactions. Dermatitis.
- Propensity to affect acidotic patients.
- Spring and autumn c.

FEATURES

- Ubiquitous saprophytic filamentous mould.
- Found in soil, dead plant material, fruit juice, stored fruits and vegetables, and other sources of easily accessible carbohydrates.
- Broad range of habitats. Colonizes moist places; common in cellars and stables. Can even survive in water if it contains decomposing plant material and droppings. Yet very drought tolerant and thus also abundant in sandy soils [where drought has knocked out more moisture-dependent species of fungi],
- Forms rapidly growing colonies, white initially, greyish brown with age; fluffy appearance resembling cotton candy.
- Tendency to overgrow and inhibit other fungi; doesn't like competition.
- Spores slimy and swelling up to several times their original size by absorbing water. These slimy spore masses are an adaptation for insect or water dispersal.
- May cause infections in man, cattle, swine, amphibians, fish, and frogs. [Mucor and Rhizopus spp. exist as commensals and can be cultured from the oral cavity, nasal passages, throat, and stool of healthy persons.]

Mucor mucedo belongs to the first fungi appearing on dead, nutritious rich plant material as fallen fruits, flowers, leaves and other herbaceous material rich in sugars. It also occurs on decaying fruit bodies of fleshy mushrooms. Its ecological strategy is a typical hit and run, or r-strategy, quickly establishing on suitable, patchy substrates. They withdraw as many nutrients as possible from this substrate and produce enormous amounts of spores that can live for long periods. The spores can spread over long distances to new, suitable substrates, often miles from the original location.

Mucor mucedo produces many asexual aplanospores [non-motile spores] in globose, pinhead shaped sporangia during its growing period. When the nutrient in the substrate is decreasing, sexual zygosporangia are produced. They are thick walled and dark pigmented and can survive for many years.

Due to its preference for fresh, sugar-rich material, it also occurs frequendy on our food or garbage, spreading its spores indoors to kitchens, food chambers, sitting rooms, cellars, laboratories etc. Therefore, it is an unwanted guest on bread, jam, porridge, and all other sorts of foods rich

in sugars. If the spores come inside a sterile laboratory, the fungus is disastrous, and it is very difficult to eradicate because of its viable aplanospores that can be almost everywhere.
[http://www.uio.no/conferences/imc7/NFotm2002/July2002.htm]

SEXUAL RENDEZVOUS

• The behaviour of Mucor mucedo, as well as of other Mucorales, during sexual encounters resembles human or animal courtship. When the mycelia of opposite strains come together, specialized hyphae develop which approach one another, actuated apparently by a mutual attraction. They touch at or a little behind their tips, to check compatibility, and if this is found to agree, a club-shaped progametangium is formed at the point of contact, triggered by the release of a sex hormone called trisporic acid. Initially divided transversely by a semi-permeable membrane, in due course open communication between both partners is afforded by the dissolution of the intervening wall. The contents mingle, the nuclei fuse in pairs, the wall becomes greatly thickened and differentiated into layers, and the formation of the zygospore is complete. After a resting period lasting from five to nine months the zygospore of Mucor mucedo germinates. [Gwynne-Vaughan]

CLINICAL FEATURES

• Listed by the U.S Government's Occupational Safety and Health Administration [OSHA] as Allergen and Irritant, causing Hypersensitivity pneumonitis and Dermatitis.

• Several members of the Mucorales are involved in a group of infections referred to as zygomycosis or, formerly, as mucormycosis. There are several types.

• *Rhinocerebral* zygomycosis affects severely debilitated patients and patients with diabetic acidosis. Patients typically present with a history of fever, unilateral facial pain or headaches, acute sinusitis, facial cellulitis, nasal congestion, dark nasal scabbing, epistaxis, periorbital oedema, lachrymation, blurred vision, and lethargy.

> The infection begins in the sinuses, then grows with dramatic rapidity outward to the eyes and inward to the brain. The eyes bulge and may become paralysed, the eyelids droop, and there is often some degree of facial paralysis. The disease usually progresses with devastating rapidity, and is often fatal within 7 days. [Kendrick 2000]

• *Pulmonary* zygomycosis strikes people with leukemia or lymphoma, as well as transplant patients undergoing steroid therapy or patients on dialysis. The symptoms are those of bronchitis and pneumonia - fever, cough, despond, chest pain, haemoptysis - with complications like thrombosis or infarction, due to the property of these fungi to invade vascular tissues. The production of gross, black, necrotic debris is the hallmark of a Zygomycete infection.

• *Cutaneous* zygomycosis is due to local trauma or inoculation. Skin lesions begin with induration and erythema and develop gradually into a necrotic ulcer with a characteristic dark central area. The margins of the ulcer are sharply demarcated. Patients with severe burns are particularly at risk for the infection to disseminate rapidly and widely.

• Other forms include septic arthritis, dialysis-associated peritonitis, renal infections, and gastrointestinal zygomycosis.

• Zygomycetous fungi have a propensity to affect acidotic patients, including diabetics and patients with acidosis secondary to renal insufficiency, diarrhoea, and aspirin intake. It has been reported that zygomycosis may actually predispose diabetic patients to have diabetic ketoacidosis.

MATERIA MEDICA

= Introduced into homeopathy by the French physician Pommier de Santi in 1955. Not proved, hence clinical symptoms only.

Generals

« Asthenia; emaciation; anaemia.
— Dryness [skin, hair, nails].
~ Decalcification with phosphaturia.

Saprophytic mould. Colonizes moist places but is also very drought tolerant. Rapid growth. Carbohydrates. Overgrows and inhibits other fungi; doesn't like competition. Intricate courtship. Allergenic reactions. Dermatitis. Propensity to affect acidotic patients. Chronic otitis and sinusitis. Spring and autumn <. > seaside Tonsils and adenoids.

® Aggravation in spring and autumn.
=> Amelioration from a prolonged stay at the seaside after a slight aggravation initially.
[Both modalities belong to chronic or recurrent eruptions of mycotic origin, as well as to bronchorrhoea and otorrhoea - Voisin.]

Locals

= Humid asthma, dyspnoea and expectoration.
= Chronic sinusitis.
=> Chronic otitis.
= Adenoid growths in nasopharynx.
«= Adenoiditis during dentition.
= Phlegmonous tonsillitis.
= Hypertrophy of tonsils.

[O.A. Julian, Materia Medica of Nosodes; New Delhi, 1980]

MUCOR CUM ASPERGILLUS CUM PENICILLIUM Mucor-a-p.

The Hahnemannian Monthly, Vol. V, 1870, featured an article by Dr. J.H. Marsden entitled "The action of the wheat straw fungi on the human organism."

> [Marsden] noticed that during the threshing of wheat, certain effects were caused in people in the vicinity of the operation. These effects were: a sudden chilliness, with a feeling of coryza, and malaise. These symptoms increased, then profuse perspiration ensued. The following day, nausea, tightness of the chest, chilliness in the back, neuralgic pains in the side of the neck, weariness and aching of the limbs developed - all of which lasted some days. Marsden noted these symptoms and signs regularly and he was so impressed that he carefully enumerated the following as being a complete word picture of a person who had inhaled the dust produced during the threshing of wheat:
>
> "The patient first complains of waves of chilliness first felt in the feet and ankles, but which rise up the lower limbs to the small of the back. Pyrexia develops and the patient feels nauseated but does not vomit. He feels extremely thirsty, his chest is sore, he has a severe headache which does not subside until the temperature returns to normal; the headache is described as darting from temple to temple. The extreme fever is accompanied by profuse perspiration. The symptoms usually last for three-four days."
>
> Previously, in 1862, a Dr. Salisbury, a Surgeon in the Union Army during the American Civil War, wrote his account of soldiering in the *American Journal of the Medical Sciences.* Among his interesting reminiscences, he relates that on several occasions he had examined soldiers who recently had been pitching old straw upon which to lie. The soldiers complained of certain symptoms - a sore throat, with chilliness and pains in the back. The chilled feeling was followed by fever, headache, congested feeling in the chest, swollen and inflamed fauces with severe catarrhal symptoms. A measle-like rash appeared on the face and neck and the patient developed a taste of old straw. The fever persisted for some days. The rash passed downwards over the whole body and began to disappear from the face. The patient then gradually recovered. Salisbury called this condition "Camp Measles" - a sickness which was prevalent in the Union Army.
>
> [James Connor, *Influenza and Measles Syndromes Induced by Contact to the Fungi Mucor, Aspergillus and Penicillium·,* British Homoeopathic Journal, January 1959]

> Connor points out that an interesting fact "which emerges from the observations of Marsden and Salisbury is that the signs and symptoms they described are comparable with the virus infections of influenza and measles." The similarity brings Connor to the conclusion that "the effect of inhalation of large quantities of spores may be to reduce lung resistance to virus infections."

Consequently, "a decision was made to apply the homeopathic law," that is: "If fungi caused, or had a bearing on, the incidence of these virus infections, it may be possible to use potentised fungi in the treatment of them." Accordingly, "a quantity of wheat straw was obtained, incubated and allowed to fungate." Next, a sample was cultured and found to be composed of three separate fungi, namely, species of *Mucor, Aspergillus,* and *Penicillium.* From the main supply of the fungi a remedy was made. It was named M.A.P. after the initials of each of its components.

> Armed with these homeopathic dilutions [of M.A.P.], suitable patients were eagerly sought. So far the remedy has been in use for only two months, and 40 cases of influenza symptoms and 20 cases of measles symptoms have been treated. At first the remedy was cautiously administered until a clear picture of any reactions was obtained. The first volunteer patient was a young male presenting influenza symptoms. He had been unwell for two days before treatment commenced. On examination he had a temperature of 104-6° F. and the onset and course were identical to those described by Marsden.
>
> The 30th potency was given by adding about 20 granules to distilled water, one teaspoonful of the liquid being given 2-hourly for 24 hours, then stopped. His symptoms, which had been lessening during the day - his temperature had dropped to 100; and he felt generally much better - gradually returned. The remedy was resumed 12 hours later at 4-hourly intervals, and the symptoms disappeared completely within 48 hours. This procedure was repeated with six subsequent cases with similar results.
>
> Fortified and encouraged by these results the remedy is now administered continuously for 48 hours at 4-hourly intervals and all the symptoms have disappeared within three days. Only 20 children with symptoms of measles have, so far, been treated and within four days they have been symptom-free, apart from a residual cough which usually disappeared in about a week.
>
> [James Connor]

Following Margaret Blackie, who prescribed the remedy for patients with allergic symptoms in the autumn when constitutional treatment failed to give improvement, M.A.P. has two symptoms in the repertory:

- Respiration, Wheezing, seasons, in autumn.
- Cough, Seasons, in autumn.

Scientific name Rhizopus stolonifer var. stolonifer (Ehrenb.) Vuillemin 1902.

Synonym Rhizopus nigricans Ehrenb. 1821. Black bread mould.

Common name Mucoraceae.

Family RHIZOPUS NIGRICANS **Rhiz.**

KEYS

- Black bread mould.
- Thrives in damp places.
- Fast growth; tendency to overgrow and inhibit other fungi.
- Transforms sterols.
- Manganese.
- Allergen [hay fever and hay asthma].

FEATURES

- Ubiquitous saprophytic fungus thriving and sporulating only in damp places where the atmosphere is more or less saturated with moisture.

"Rhizopus stolonifer will colonize the moist interior of a loaf of bread, but won't produce its characteristic sporangiophores and mitosporangia on the outside of the bread unless the surrounding atmosphere is humid. If we persuade the fungus to sporulate by keeping the loaf in a damp chamber [a plastic bag containing a few drops of water will do] and then take it out of the bag, the sporangiophores will quickly collapse." [Kendrick]

- Found on old bread, decaying fruits and vegetables, spoiled canned foods, and in soil.
- Produces an extensive mycelium, which is embedded in the substrate.
- Spores dry and airborne. [Mucor's slimy spores are dispersed by animals.]
- Forming floccose or woolly colonies with black dots, Rhizopus grows astonishingly fast.

"It rapidly fills the entire Petri dish or test tube with abundant matted or intertwining aerial mycelium. *Rhizopus* species have been called a 'lid-lifter' because it can literally push up the top of a standard plastic Petri dish. [Fisher]

- Tendency to overgrow and inhibit other fungi.
- Its growth is stimulated by manganese.
- Produces fumaric acid by fermenting glucose or molasses. Fumaric acid is used in making wetting agents, alkyd resins, and as a flavouring agent [apple, peach, and vanilla flavours] or acidulant in sugar confectionery, instant tea powder, and chewing gum. The substance has been used experimentally to treat psoriasis, eczema, and dermatitis.
- Due to its capacity to transform sterols, Rhizopus stolonifer provides the starting material for the industrial manufacture of such medically important compounds as cortisone, hydrocortisone, and prednisone.

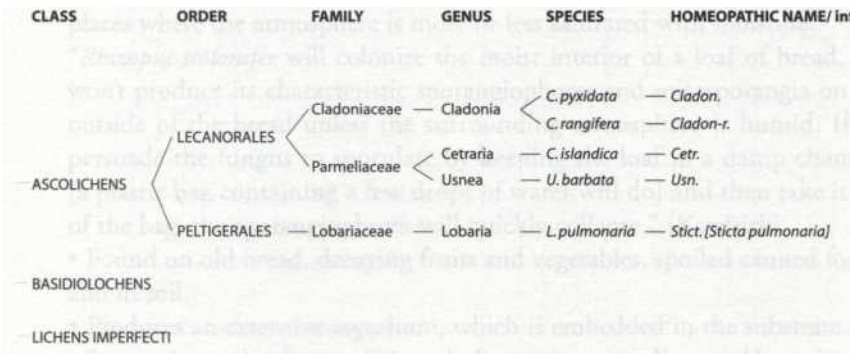
CLINICAL FEATURES

- Rhizopus spp. are reported to be allergenic: hay fever and hay asthma.
- Associated with certain occupational-related types of hypersensitivity pneumonitis such as "paprika splitter's lung, wood trimmers lung, and "sawmill lung."
- May cause zygomycosis in immunocompromised patients. *[See* Mucor mucedo.]

SUBPHYLUM LICHENES [Lichens]

Lichens are symbiotic associations, mostly of Ascomycota [subclass Discomycetes] with either Cyanobacteria [blue-green algae] or Chlorophyta [green algae]. Over 98% of all lichenized fungi are ascomycetes. Occasionally the fungal partner is a basidiomycete or a deuteromycete [imperfect fungus]. They are classified according to the nature of the fungus. Although by some mycologists not recognized as a formal taxonomic group, also because the affinities of many lichens are still unknown, the [sub] phylum Lichenes is maintained for convenience.

SUBPHYLUM LICHENS



LICHENS

Partnership or governance

• As compound organisms consisting of a fungus and an alga [or cyanobacterium], lichens have been regarded as examples of an ideal partnership of organisms thoroughly suited for growth together, as "Nature's Perfect Marriage," as one author put it. The fungus composes the larger part of the lichen, while the algae are enclosed between fungus hyphae and sometimes even are invaded by them; usually they form a layer near the upper surface of the lichen, constituting only 5-10% of the total biomass.

The photosynthetic algal partner manufactures energy-rich carbon compounds for itself *and* for the fungal component of the lichen. The fungal partner apparently exploits the alga for algal cells. Lichen "leak" photosynthetic products [soluble carbohydrates] at a greater rate than do similar cells growing on their own.

The fungus in turn provides water and minerals and builds a complex thallus [main body of the lichen], protecting the alga from drying out in very dry situations. The algae or cyanobacteria included in lichens also occur as free-living species, whereas the lichen fungi are generally found in nature only in lichens. The alliance appears to have more the character of *co-dependency* than of a truly mutually beneficial symbiosis. The fungal partner plays the major role in determining the form of the lichen, as is shown by the fact that a single fungus, associated with different kinds of algae, can produce morphologically very different individuals that have traditionally even been placed in different genera.

A rather traditional division of tasks is established: the alga supplies the food and the fungus arranges the accommodation. In addition to providing mechanical protection the association enables the algal partner to live in extreme conditions where it might otherwise be destroyed by the harsh environment. For this dependency on the association for survival it sacrifices its ability to grow and reproduce at its maximum rate.

• The fungal partner is not able to exist by itself and thus clings to life by holding the alga captive. Domesticating and dominating its partner the fungus behaves like a domestic tyrant, or as Kendrick puts it: "In fact, the fungus

has effectively 'captured' the alga, and the relationship is one of exploitation or balanced parasitism rather than of mutualistic symbiosis, since about 50% of the food synthesized by the alga is pirated by the fungal hyphae, which form tight little cages around the algal cells."

- The partnership appears to be a marriage of convenience rather than a love match. Kendrick suggests that it is due to sheer necessity: "For many years all our best efforts to synthesize lichens from their component fungi and algae failed. Only relatively recently was the trick finally mastered. It involves having each of the prospective partners in a thoroughly debilitated condition. Only then, it seems, will the fungus literally embrace the alga, and only then will the alga permit itself to be co-opted without making the ultimate protest."

Some hundred years prior to the mushrooming of the emancipation movement the Swiss botanist Simon Schwendener [1829-1919] expressed it even more crassly by depicting the fungus as some sort of slave driver. He envisioned the fungus in lichens to be parasitic on the enslaved alga and described this condition as *helotism.* [A helot is neither slave nor free. The word comes from the name for a class of serfs among the ancient Spartans, who were deliberately humiliated and liable to massacre.]

> As the result of my researches, all these growths [lichens] are not simple plants, not individuals in the ordinary sense of the word; they are rather colonies, which consist of hundreds and thousands of individuals, of which, however, one alone plays the master, whilst the rest in perpetual captivity prepare the nutriment for themselves and their master. This master is a fungus of the class *Ascomycetes,* a parasite which is accustomed to live upon others' work; its slaves are green algae, which it has sought out, or indeed caught hold of, and compelled into its service.
>
> It surrounds them as a spider its prey, with a fibrous net of narrow meshes, which is gradually converted into an impenetrable covering; but whilst the spider sucks its prey and leaves it dead, the fungus incites the algae found in its net to more rapid activity, nay, to more vigorous increase.
>
> [cited in Cooke 1893]

- Whether the fungus should be regarded a partner or a ruler, the fact remains that lichens, by combining talents and strengths, realize the unique

capacity to live in many places that neither of the two organisms could survive in alone.

..

Moreover, lichens grow where no eukaryot [higher organisms whose cells have nuclei surrounded by a membrane] has succeeded. United in adversity.

Habitat ,

• As a broad distinction plants can be regarded as assemblers, animals [and humans] as consumers, fungi as decomposers, and lichens as preservers. Lichens living on rocks often secrete acids [eg oxalic acid] that with time cause the rock to disintegrate and create soil. Lichens living on sand cover it from the erosion-causing wind, binding the sand together. Where life is dying out, drying up, freezing, congealing, stripped down naked, there we find them, the hardiest organisms on earth. Lichens are perennial.

They grow very slowly and attain an extreme age. The smaller encrusting lichens may grow as little as 0,1 mm a year, while larger forms have an annual growth of up to 1 cm. Some colonies are estimated to be more than 5000 years old. Lichens which grow upon the bark of trees may be seen flourishing in profusion during the life and vigour of the tree, or rather the reverse: lichen-covered trees are healthier than trees devoid of them. Cinchona bark, for example, which has been covered with lichens during growth has its qualities improved. This is probably due to the sunlight filtering properties of lichen, providing protection against UV light.

Lichens colonise some of the most inhospitable habitats on earth. In less extreme climates they inhabit almost any solid surface, ranging from rocks on seashores, to animal bones, walls, trees, concrete, and rusty metal. Where natural outcrops of rock are absent, the churchyard is the most important site for lichens growing on stone.

Some English churchyards have been found to contain more than species. Some species rarely occur in other habitats. In Britain as a whole, 674 species [well over a third of the British list] have been found mainly on stone, but also on wood, trees and soil in churchyards, cemeteries and the surrounds of abbeys and cathedrals J

As adaptations for life in marginal habitats, lichens produce an arsenal of more than 500 unique biochemical compounds that serve to control light exposure, repel herbivores, kill attacking microbes, and discourage competition from plants.

1 British Lichen Society - Churchyard Lichens Fact Sheet, Edition 6, February 2002.

Advance or retreat

• There are two ways to look at lichens. Either they are organisms settling courageously in places where virtually no other life form dare come, or they lack the ability to compete with other life forms, due to their extremely slow growth rate, and so, because of the principle of natural selection, were left with ecological niches too hostile for competitors to survive.

According to Blair Hedges of Pennsylvania State University [Science, August 2001], aquatic fungi evolved into a terrestrial form about 1.3 billion years ago. These early fungal forms were actually lichens because they formed a symbiotic relationship with primitive aquatic green algae.

The early land surface of the Earth at this time contained numerous colourful rock lichens. The bright pigments served to reduce the harmful effects of ultraviolet radiation in a primitive atmosphere. By providing protection for their algal partner to produce oxygen and release it into the atmosphere, lichens helped to transform the Earth from a hostile place into an inhabitable one and paved the way for the successive development of land plants, an evolution further advanced by mycorrhizal fungi. By allying themselves with fungi, the earliest vascular plants took hold of the land, giving rise to the ancestors of modern conifers and flowering plants.

Co-operation and partnership, irrespective of the exact nature of the union, play an invaluable role in the living world. The ability to maximise collaboration with other species accounts as much for evolutionary developments as Darwin's model. Life seen as a tooth-and-claw struggle for existence, to which humans add greatly, would make lichens into losers retreating to remote places, whereas life seen as depending on co-operation makes them heroic endurers contributing to the connectedness of life.

The latter was shown by a study in northern Sweden, where birds, invertebrates and lichens were all found to be functionally connected. Lichens being a part of many food webs, the number and biomass of invertebrates were demonstrated to be related to the number of lichens. There is not strength without unity. [For more on the symbiotic view on evolution, see Lynn Margulis, *Symbiotic Planet: A New Look at Evolution·,* New York, 1999.]

Growth forms

- Five basic growth forms are distinguished.
  - Crustose. Crustlike or flaky, closely attached to, or even embedded in, the surface/ substrate. Often form brilliantly coloured streaks. Cannot be

removed without crumbling away.

- Squamulose. Tightly clustered and slightly flattened pebble-like units, often found on soil. Edges of the body are free from the supporting surface.
- Foliose. Leaflike, with flat sheets of tissue not tightly bound, spreading out in a horizontal layer over the surface. Homeopathic representative: *Lobaria* [Sticta].
- Fruticose. Free branching, either erect and bushy or hanging and tassellike; growing away from their substrate. Homeopathic representatives: *Usnea, Cetraria, Cladonia.*
- Leprose. The entire thallus is made up of loose, powdery material.

Water

• During periods of unfavourable conditions lichens shut down metaboli- cally, thus becoming dormant and highly insensitive, which enables them to survive extremes in light intensity, heat, cold, and drought. When it rains, they imbibe water rapidly and again assume rapid rates of photosynthesis and respiration. In particular crustose lichens are drought resistant and do well in dry or extreme climates like deserts, tundras, Arctic and Alpine regions. Fruticose lichens prefer humid foggy areas [high relative humidity], while foliose lichens need frequent rainfall.

At one time, it was thought that the fungal tissue protected the alga or cyanobacterium from drying out. Actually, one of the chief factors in lichen survival seems to be the fact that they dry out very rapidly. Lichens are frequently very dessicated in nature, with a water content ranging from only 2 to 10% of their dry weight.

When the lichen dries out, photosynthesis ceases; in this state of 'suspended animation', even blazing sunlight or great extremes of heat or cold can be endured by some species of lichens. Cessation of photosynthesis depends, in large part, on the fact that the upper cortex of the lichen becomes thicker and more opaque when dry, cutting off the passage of light energy.

A wet lichen is destroyed by light intensities or temperatures that do not harm a dry lichen. When a lichen is wetted by rain, it absorbs 3 to 35 times its own weight in water in a very short time. If a dry, brittle lichen is submerged in water, it becomes soft and pliable within a few minutes.

> The lichen reaches its maximum vitality, as judged by the rate of photosynthesis, after it has been soaked with water and has begun to dry. Its rate of photosynthesis reaches a peak when the water content is 65 to 90% of the maximum it can hold; below this level, if the lichen continues to lose water, the rate of photosynthesis decreases. In many environments, the water content of the lichen varies markedly in the course of a day, with most photosynthesis taking place only during a few hours, usually in the early morning after wetting by fog or dew.
> [Raven 1986]

The adaptability to dry environments is closely correlated with the light loving characteristics of most lichens.

Brittleness

• Desiccation of lichens when moisture is unavailable is not simply dehydration as it occurs in plants and animals, but a complete loss of body water so that the lichen becomes quite brittle. Not only can lichens endure this, it helps them to reproduce for, while they are dry and brittle, pieces may flake off and later grow into new lichens after being re-wetted in their new environment.

> The tolerance of lichens is almost unbelievable. They can live without water for many months and come to no harm even drying out completely. If they then fall to pieces each piece can be the beginning of a new lichen. In fact their vegetative propagation relies on small fragments breaking off and finding a new place to settle in. The lichen does not break up into single cells but disintegrates into fragments.
> This sort of scattering is foreign even to fungi which have a special organ for casting off their conidiae. The connection between inner substance and outer form in lichens must differ very greatly from what is in a green plant. One cannot imagine a green plant employing a mere formless crumbling- away as a means of vegetative propagation. In lichens the formative principle seems to work from without, not from within.
> [Grohmann 1974]

Reproduction

• Most lichens are dispersed by vegetative propagation. Dispersal is achieved by several methods in which both partners are united in dual propagules, which are disseminated by simple fragmentation, soredia [tiny balls of algae

wrapped in fungal hyphae] or isidia [wart-like outgrowths that can break off easily and grow into a new lichen]. For lichen fungi that make spores reproduction can be tricky. To form a new lichen, the fungal spores need to capture new photosynthetic partners after they germinate. Various genus-specific strategies have been documented:

> The ascospore may land on and re-shape an already growing algal or cyanobacterial colony [eg *Collema]*, invade an established lichen killing the fungal partner and taking over the algae [eg *Diploschistes],* land near and outcompete the fungal partner in a dual propagule derived from another lichen, or persist in a loose unstructered association with other algae until a truly compatible algal species arrives *[eg Xanthoria}.*
> [Kirk 2001]

Uses

• Arctic and sub arctic lichens are food for many mammals, including reindeer, moose and caribou. Other lichens contain selenium, which is poisonous to livestock. In the Middle Fast the vagrant lichen Lecanora esculenta was used for making bread.

• Lichens are used as a fixative [to control evaporation] in perfumes. Due to its "haunting mossy odour", Oakmoss lichen [Evernia prunastri] is an important ingredient in fine perfumes.

Lichens have also been used for wool [Scottish and Irish tweeds] and silk dyes, making browns, yellows, reds and similar muted colours. Purple to red- violet dyes were obtained by soaking certain lichen species in urine [ammonia]. The litmus dye used so widely as an acid-base indicator in chemistry comes from lichens.

• Some scholars believe that the biblical "manna from heaven" was the lichen species Lecanora esculenta, which has the habit of coming loose from its substrate and being blown about in the wind.

LUNGS OF THE EARTH

• Lichens obtain the greater portion of their nourishment from the atmosphere, and only their mineral constituents from the matrix. The lack of roots or other absorptive organs makes them dependent on the atmosphere and on

rainfall for their nutrition. The additional lack of an outer cuticle makes them like sponges that absorb much of which they are in contact with. Lichens are consequently highly sensitive to perturbations in the chemistry of rain and air, the more since they are unable to excrete the toxic substances they absorb. Thus, they have become valuable indicators of the occurrence of atmospheric pollution. Both acid rain and elevated levels of sulphur dioxide kill many species of lichens and consequently the trees whose vigour and vitality they enhanced.

Containing antibiotic compounds and immunostimulant substances lichens possess remarkable medicinal powers. Some species, particularly Usnea, are effective in the treatment of tuberculosis.

> Many species of lichen show intensive antibiotic activity, and this recalls the fungal component in the symbiosis. Here one thinks of the antibiotics deriving from yeast fungi, penicillin and related substances. Out of 100 species of lichens examined in the U.S.A., 52 contained bactericidal substances; and 38 of the 58 Swiss species investigated were found to have antibiotic and tuberculostatic properties, 17 of them to a considerable extent. Pulmonary moss, Iceland moss, reindeer moss were for a long time popular remedies for tubercular diseases of the lung. In Chinese medicine, and also in the native medicine of Africa and South America, species of Usnea were used to treat festering wounds.
>
> The usnic acid obtained from species of Usnea has such a powerful bacteriostatic action that in the Russian army extracts of the lichen were used to impregnate field dressings. ... The lichens have always been used as *remedies for diseases of the lung.* The lung is an organ which in its development has been linked with the evolution of *dry land;* only when life has found a foothold on this firm earth and was no longer unfolding only in the water, was it possible for lungs to develop.
>
> [Pelikan 1970]

USNIC ACID

• The ability of lichens to survive extreme environmental conditions is mainly due to three factors: [1] the capacity for survival in a metabolic resting state for months; [2] slow metabolism and slow growth rate; [3] production of many particular bioactive compounds which provide protection against herbivorous predators [insects, snails, nematodes] and help gaining ascendancy over

competitors [bacteria, mosses, liverworts].

Lichens produce a plethora of biologically active compounds. One of the most common compounds is usnic acid. Uniquely found in lichens, usnic acid has been identified in several phylogenetically distant genera, amongst others in *Cladonia* and *Usnea.* It is a yellowish pigment and a product of the fungal partner.

The substance has valuable bacteriostatic properties. Hobbs reported that usnic acid "completely inhibited the growth of TB in dilutions of 1:20,000 - 1:50,000 and weakened their growth at 1:200,000 - 1:2,000,000." The effectiveness against Mycobacterium tuberculosis is part of its general activity against Gram-positive bacterial strains. Of particular relevance is the inhibition of growth of multi-resistant strains of *Streptococcus aureus,* enterococci and mycobacteria. Commercial preparations of usnic acid, eg Usneasan, Granobil and other products, are employed against infections [as an alternative to Echinacea], bacterial eczema, mastitis, and furunculosis. Selective activity appears to be exhibited against *Streptococcus mutans,* a species associated with the production of plaque and dental caries in humans. Toothpastes or mouthwashes with usnic acid as the active principle have shown in trials with human volunteers to reduce plaque and caries formation without disturbing the oral saprophyte flora.

In certain habitats lichens have to compete with lower plant organisms such as mosses and liverworts. Usnic acid is then released to inhibit the germination or growth of nearby plants and so reduce competition. Another activity of usnic acid is its functioning as an antitranspirant', i.e. it diminishes water loss, thus increasing survival in arid areas or prolonged periods of drought. Usnic acid absorbs UV light, as do other lichen pigments. The mycobiont protects in this way its partner against radiation damage. There is some evidence that the concentration of usnic acid in Antarctic lichens is directly proportional to the entity of ozone depletion. Hence the application of usnic acid in sunscreen products.

[Data from: M. Cocchietto et al., *A review on usnic acid, an interesting natural compound;* Naturwissenschaften (2002) 89:137-146]

SIGNATURE/THEMES OF LICHENS

- Hardy, yet vulnerable.
- Delicate strength.
- Very susceptible to air pollution.
- Absorb as sponges much of what they are in contact with.
- Light-loving.
- Protection against UV light.
- Lightness.
- Brittleness.
- Slowness.
- Highly insensitive during periods of unfavourable conditions.
- Activity alternating with periods of dormancy.
- Partnership - rulership.
- Partnership born out of necessity; united in adversity.
- Colonization.
- Preservation.
- Inhospitable habitats.
- Advance or retreat.

CLASS ASCOLICHENES

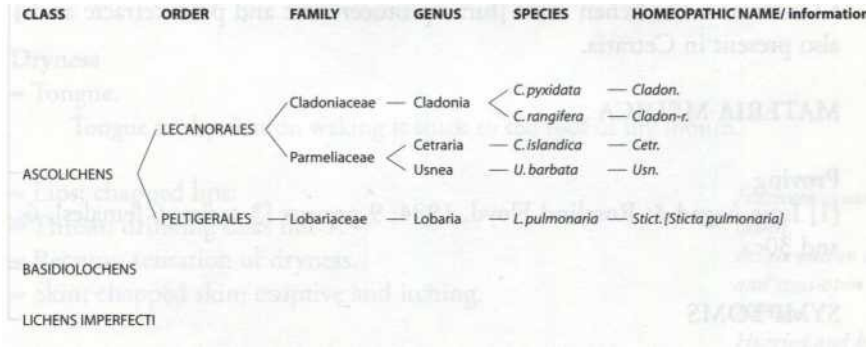
I. ORDER LECANORALES

I A. FAMILY CLADONIACEAE

Cladonia pyxidata

Cladonia rangiferina

SUBPHYLUM LICHENS



CLADONIA PYXIDATA **Cladon.**

Scientific name	Cladonia pyxidata (L.) Hoffm. 1795.
Synonym	Lichen pixidatus L. 1753.
Common name	Pixie Cup Lichen.
Family	Cladoniaceae.

KEYS

- Fruticose-squamulose lichen.
- Acidic soils in open and semi-open habitats.
- Hurried and busy.
- Dryness.
- Open air >.

FEATURES

- Blue-green lichen; distributed widely throughout Europe in non-urban, unpolluted areas.
- Greyish white, hollow, goblet-shaped clubs of 1 cm tall arise from clusters of greyish green to olive or brown squamulose thalli.
- Grows on barren ground or on soil or moss over rock.
- Forms large groups on rock and dead wood.
- Occurs in a wide array of open and semi-open habitats; grows best in direct sun.
- Most of the lichens on bogs belong to the genus Cladonia. One of the commonest species is Cladonia pyxidata. When a bog has been burned Cladonia lichens are quick to re-colonise the bare peat.
- Contains bitter lichen acids [fumarprotocertraric and protocetracic acids] also present in Cetraria.

MATERIA MEDICA

Proving

[1] Izzie Azgad & Rosalind Floyd, 1994; 9 provers [3 males, 6 females], 6c and 30c.

SYMPTOMS

Busy and hurried

= Hurried feeling.

This afternoon I felt as if I have to rush around hectically. Forgetting things in a shop I had to return to pick it up. There was a sensation as if I sunk in myself and wasn't clear about people around.

Some restlessness during the morning. I tried to win the time, to reach places hurriedly.

» Anxious, nervous.

Feel happy, less anxious about things in spite of a busy day.

Less anxious than usual about myriad tasks.

= Bursting headache > being busy, motion.

= Very busy stomach/ abdomen.

Gurgling with a lot of wind.

Very frequent belching.

Bubbling sensation in hypogastric region; feels as if gases are bubbling in liquid after dinner. Sounds after food and drink [even a cup of tea].

Felt very full; bloated abdomen after small lunch just as when I was pregnant.

Disorientation; uncertainty

I felt quiet - like I wasn't really here.

I dropped kitchen stuff twice and even broke a teapot. There was a feeling of uncertainty while cooking.

Strange feeling of dizziness followed by bumping of people's trolleys and bags in the supermarket.

Dryness

= Tongue.

Tongue so dry that on waking it stuck to the roof of my mouth.

·» Lips; chapped lips.

<= Throat; drinking does not >.

= Rectum; sensation of dryness.

« Skin; chapped skin; eruptive and itching.

Fruticose-squamulose lichen.
Acidic soils in open and semi-open habitats.
Hurried and busy.
Dryness.
Open air >.

Energy

= Tiredness; all day.

Difficulty in waking in morning.

Felt very weak; weak and dizzy all day long; very tired and pissed off. Continuous sensation of tiredness and sometimes objects seem vague. Exhaustion during the day all of a sudden had changed dramatically at 3 p.m.

« Sleeplessness in spite of exhaustion.

Open air >.

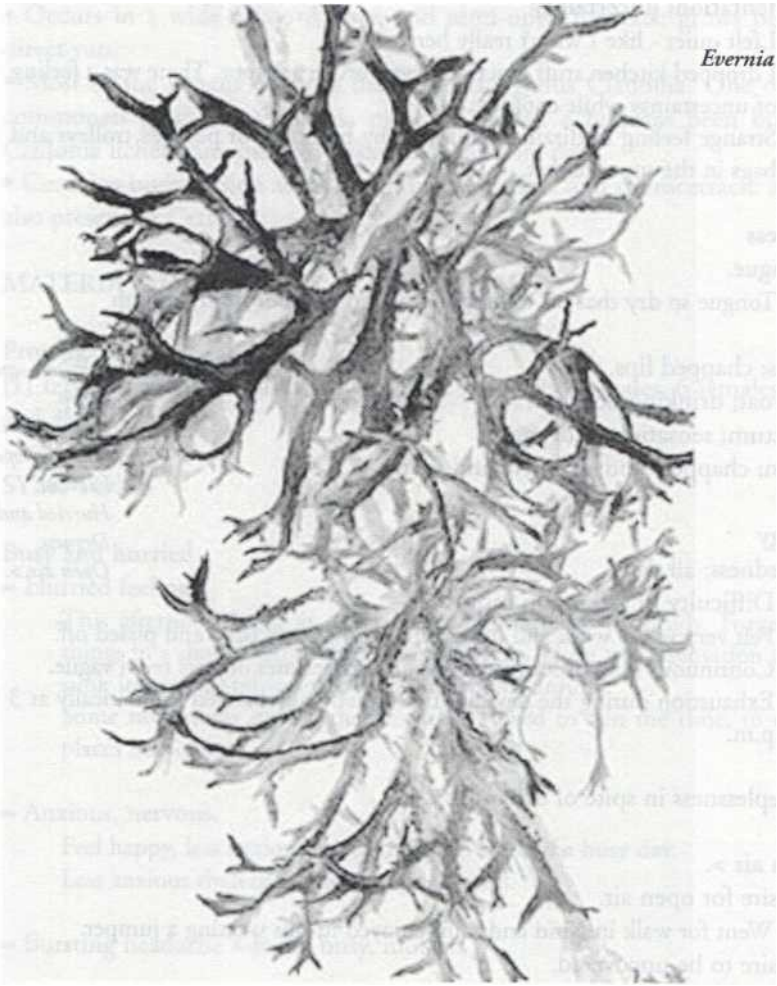
« Desire for open air.

Went for walk in wind and rain, enjoyed it, not wearing a jumper.

=* Desire to be uncovered.

·* Obstruction of sinuses and root of nose > open air.
= Breathing difficult in hot room.

Right to left
« Symptoms appear on the right side and move to the left.
[Soreness of throat; sharp pains in chest; cramps in calves at night.]
[Quotes from Izzie Azgad & Rosalind Floyd, *A Small Proving of Cladonia Pyxidata.}*



CLADONIA RANGIFERINA **Cladon-r.**

Scientific name	Cladonia rangiferina (L.) Weber ex Wiggers 1780.
Synonym	Lichen rangiferinus L. 1753.
Common name	Reindeer Moss.
Family	Cladoniaceae.

KEYS

- Fruticose lichen.
- Cool, moist climates.
- Fragile, brittle and small.
- Fragmentation; scattered and disorganized.
- Used, duped or trapped.
- Dirt; cleaning and organizing.
- Afternoon sleepiness.

FEATURES

- Slow-growing, long-lived fruticose ground lichen forming extensive stands on arctic soils.
- Resembles “a foamy, grey-green spongy mass.”
- Dominant or co-dominant ground cover on open sites dominated by spruce, birch or pine species.
- Adapted to cool, moist climates. [Subpolar temperatures inhibit competitors.]
- Common on moist to very dry, sandy, nitrogen-poor and calcium-poor soils.
- More sensitive than most other lichens to prolonged periods of drought.
- Shade intolerant; grows best in direct sun.
- Disperses mainly by means of fragmentation.
- Highly flammable when dry; recovers very slowly [30-100 years] after fire.
- Important part of the winter diet of caribou and reindeer.
- Low in proteins, minerals and vitamins; high in polysaccharides [energy source].
- Contains bitter lichen acids [fumarprotocetraric acid] also present in Cetraria.

TRADITIONAL USE

• This lichen is said to taste like sweet bran. “But after swallowing it there remained in the throat, and upon the palate, a gentle heat or sense of burning, as if a small quantity of pepper had been mixed with the lichen. ... Cooling and juicy as it was to the palate, it nevertheless warmed the stomach when swallowed, and cannot fail of proving a gratifying article of food to man or beast during the dry winter of the frigid zone.” [Cooke 1893]

MATERIA MEDICA

Proving

[1] Misha Norland, 2002.

THEMES

[Number behind symptom indicates prover.]

Brittle and small [6 provers]

= Half way through the afternoon, I began to feel very detached and insecure - very small. No-one here really likes me much. I shouldn’t be here. Felt very, very depressed and on the verge of tears. ... Began the drive home - had the sensation of a lump in my chest and throat as if about to cry. Felt very, very low and under confident. Very small and insecure. Wanted to cry. [1]

“ Sick of being an adult, of having so many responsibilities, things to sort out, pay for, take care of. Too many worries. I’d like to be 14 again, to be back living with my parents, all responsibilities lifted from me, nothing important to worry about. I guess I’m still basically feeling that I can’t really cope with anything. Everything seems too much. [1]

- Feel lonely and fed up. I’m tired of doing all the parenting on my own, I feel like I’m not equipped for it, working blind all the time and the goalposts keep moving. [5]

» Burst into tears when spoke to supervisor and found it hard to stop sobbing throughout call. Felt very weak and over emotional. Felt better after crying. Was looking for and better for sympathy. Followed boyfriend around flat all evening. Didn’t want to be on own. [7]

“ Dream: I was trying to do some yoga but I was too weak and tired and couldn’t do any of the moves/poses - kept shaking and collapsing. [7]

— Went for a walk in a place where I did not like the atmosphere and even looked behind me several times to see if I was being followed - I didn't feel safe. [2]

== Not really aware of anything until afternoon break. Have a cold feeling inside - for some reason it reminds me of when I was a teenager - that feeling of not quite belonging, feeling vulnerable, feeling different somehow. I feel like I want to put on a nice flufly all in one suit, zip it up and curl up alone somewhere. [10]

Anxiety and anticipation [2 provers]

= Feeling of tremendous anxiety and dread, anything I think of that I need to do today feel to be too much and I can't cope with it. Feel quite depressed and de-motivated. [3]

== Everyone was speaking into the video camera about the past month's symptoms, there was no way I could have spoken even off camera. This anxiety is so intense I think it should be called fear, even terror. [3]

«= Feeling freaked out - about life, diet, being toxic, not having any money, not doing any homework, well freaked out about just about everything really. [15]

Feeling of being used, duped or trapped [3 provers]

= Have an argument with husband about his high social life, whilst I am left at home to do all the work and ferry the children. Still have the feeling of refusing to be dumped on unless it suits me. [9]

« Feel very anti boyfriend. Feel used, picked up and put down again. Feel very resentful. There is nothing objectively to support it viewed in one way but it is my feeling response. I feel angry. I would like to say it's all over, let's forget it but also feel now is not the time to react. Am finding it hard to work, concentrate. I hate him so much and want to finish it. I would like to scream. There is nowhere to put it. [14]

<= Fed up with a certain friend who keeps asking me to do her 'favours'. She always asks for something within ten seconds of seeing me. The phone rings twice and I don't answer it because I think it might be her. [15]

= Feel totally trapped in house. [14]

= Dreams of being imprisoned behind bars. [15]

Dirt and bathing [6 provers]

<·» The water has been off all day for maintenance in the area. I've been

feeling filthy, grimy, dirty, diseased, itchy. Really, really want to get clean, but there hasn't been even any cold water, let alone any for a bath. I feel disgusting. I stink. I repulse myself. Water finally back on - had bath. The water was soothing. Felt slightly better, able to get dressed & face leaving the house. [1]

= The house is untidy and dirty, I'm getting no help with cleaning and cooking [but I'm not asking for it and don't feel I should have to lower myself to ask], [4]

" Generally untidy and unmotivated - my desk is in a terrible mess and the flat is very untidy but it's not bothering me [unusual]. [7]

« Strange thing is that I do not want to bath and wash as much as usual. Usually bath every other day and strip wash or shower every day, but I do not fancy lying in the bath or even having a shower. I do not want to undress and get colder. [9]

« Dog shit figured in my dream. We were sitting at a table outside to eat food and to work in exercise books and there was dog shit on the table, it was very dried up and hard. My partner moved it to the end of the table. I felt as if the whole table was contaminated, I also felt his hands were contaminated, I was most uncomfortable. There was other lumps of it around on the ground, not a lot but enough to make the area smell of it. [3]

" My son was in the bath, I go over to him, the water is filthy and there are clusters of worms right beside him. He's got underpants on but I remember reading that worms can get in your orifices. In a terrible panic I scoop him out of the bath and run him under fresh water. [5]

Fragmentation; scattered and disorganized [5 provers]

<= *Feel very shaky, small, fragile, breaking.* I'm going to get hurt. Am I making mistakes? [17]

«· Very confused feeling - just can't settle to my work at all. Can't think about even basic organizational things, such as where I've filed certain papers, or how to approach the homework question. Foggy. Confused. Can't concentrate. [1]

=> Misread some letters on a van - realized this is about the third time I've done this in the last week. [2]

=> Fuzzy headed in supermarket - got confused easily. Music playing and tills bleeping all merged together - felt absorbed by it. [7]

= Effort to do anything. Completely disorganized. Things keep happening

unexpectedly and I can't seem to plan. [13]

= Dream: I was with 3 colleagues from work and we all swapped identities. I had trouble remembering who was actually who or which body I was in. [7]

= Keep losing things, keys etc. Keep ferreting about in bags and pockets, can't find things that were there a moment ago. [14]

— ... feels as though the floor has been pulled out from underneath me and I can't get a grip on anything. Feel very helpless and vulnerable. [7]

Cleaning and organizing [6 provers]

«= Decided to have another bath - the idea of being in lots of hot, soothing water seems like a good one -the only thing I can think of which even vaguely appeals. [1]

— Finished sorting out kitchen then moved on to other cupboards, clearing out games, books, clothes etc. [2]

= Urge to move furniture and pictures around - carried it out. Pleased with the results. [8]

=> Very efficient and single minded. Organized my jobs for the day before the school run and going straight to town to sort out banking, etc. Instead of beings involved in every last detail of everyone's lives I am just getting on with many things. [9]

= Feel kind of restless to do something, but I don't know what. Feel that things are moving slowly. I feel frustrated - I want to clean and purify everything. [13]

— I want to lead a clean life, have lots of fresh air and exercise but not swimming. Really don't like the idea of cold cool or tepid water. [14]

Money and material value [8 provers]

» I was a Spanish child with other Spanish children. We found money. We were dressed in rags. [13]

= Dreamt I was giving money away [£2 coins] to local people in Finland. There's a feeling that this is a very poor country and that £2 would be a year's salary for them - this will keep them alive, but I'm worried that I won't have enough money left for me. [15]

= Golden yellow has attracted my attention this evening, and seems to be more obvious than other colours. ... Sang a new song with 'gold' in it. [2]

= Noticing all the shiny objects about, taps, door knobs, my bracelet. [17]<·» Very, very anxious about money again. Getting hot flushes at the

thought of money - how much we've been spending lately [even though it's all been on necessities]. Panicky. [1]

=» I feel easily upset, fragile and weepy. Extremely anxious about money - I'm running out! On being presented with the Access bill I experienced rapid heart rate, feeling of stress, trembling, dry mouth, desire to open bowels, slight nausea. [3]

-» My old fears and insecurities about money are coming back - yet I am spending money I shouldn't. Not like me at all. [51

= Dream: Black man tries to give me and my friend some money. She says no and I say yes. He seems friendly and nice. As soon as he has given me the money he changes, he seems suddenly menacing - it is as if I now owe him something. I try to give him the money back but he will not take it. He wants me to do something for him but I am not sure what it is, I try to get away from him but I can't. Get the feeling of "there's nothing for nothing" and "no such thing as a free lunch", [io]

Symbiosis [2 provers]

One area of compensation for this insecurity is through a Soul Mate and a symbiotic relationship with a partner. There is also a great dependency on the lichen by the reindeer [which are known as caribou in North America], as in turn there is on the reindeer by the Laplanders and the Inuit. In the extreme Arctic conditions such dependencies are absolute and any failing in them would undoubtedly result in annihilation.

[Peter Fraser, collator of proving]

= Felt quite lonely on arriving back home; desired company, and a partner. [2]

= A strong feeling during the proving, which has remained, was of a very deep bond with my husband, that I couldn't exist without him. There was a fear that I would lose him, thet he would leave me, and a jealousy that was totally irrational, that something would divide us and I would not be able to exist without him. [17]

Jealousy [6 provers]

== Episode of real jealousy in the evening. It seemed really out of context. Something that would normally go over my head just made me see red. Partner seemed quite shocked at the way I was questioning him over a woman that he had been working with. I was making out that he was keeping things from me - deep inside I knew he wasn't and that it was

all nonsense but somehow I couldn't seem to stop myself pursuing this jealous thing, [io]

= Jealousy - unfounded and foolish. The feeling is there's only room for two, him and me. Jealousy with a pain in the centre of the chest. [12]

— Felt very upset again by female friend's attitude, style, behaviour on Friday evening. Felt she had been attempting "intellectual sex" with boyfriend. Re-heard her saying "I was worried you felt left out" as really "I wanted to push you out". Saw her as a predatory female - Shiva - sex and destruction. Felt displaced and needing my nest. [14]

== Feel annoyed with the friend who keeps asking me for things. She hangs around with my boyfriend and I, asks me again for tobacco and wine, and then won't leave. Once the wine is finished, she asks if there is any more, and then asks for more tobacco. Dreamt that boyfriend and the friend were trying to have an affair, but that I was in the way. [15]

= Asked partner about who he was meeting on Friday, he merely said "a friend". Feel rejected, not trusted, reminds me of previous husbands tricks. [17]

« Very jealous of cat on partner's lap. [17]

«= Dream: my partner met and married another woman but he was still living with me. He was with her a lot and I felt like an outsider even though I was included in what they were doing, like a friend or a sister. I could not understand why he was married to her and did not live with her. She had moved into an old terraced house requiring a lot of work on it. I was despondent knowing my partner would be round there a lot doing it up for her. Eventually I got round to thinking about me and what I wanted and whether or not I would put up with the situation. I arrived at no solution. I woke up then. [3]

" Dream - about my partner's ex wife whom I have never met - I find out that she is studying homeopathy too. Then she turns up at partner's mum's house, very smartly dressed with her hair done nicely. She looks very attractive but has this smirk on her face. I feel really angry and jealous - I feel like I am dressed like a frump, unattractive fat. I feel really intensely jealous and start jumping about making a fool of myself, calling her names, thumping her car, I can't believe how stupid and childish I am being but I can't control myself. She is just smirking at me all the time and her friends are laughing at me. [10]

Suspicion [3 provers]

« Suspicious of others' motives - someone is waiting to jump into my shoes. [12] = Feeling like I'm being 'got at' by others. [15]

" Suspicious, I feel that plans are being hatched, traps are being laid. [17]

Curiosity [3 provers]

= We arrive in B&B kitchen and I start to look inside all the tins that are in the kitchen. She has a table with lots of different coloured tins that probably had biscuits or chocolates in them at one time. Some of them are very pretty. I am opening them and looking inside. Then I open her freezer and start pulling out drawers in the freezer. What am I doing, this is just not me? It is like I want to know what is inside, [io]

" On the way to work I'm suddenly very curious about the walled gardens of the houses lining one of the streets. It feels like I need to know what's behind the walls. Wish I were a cat walking along the walls from one walled garden to the next. Get to work without even noticing that I'm there. [15]

= Dreamt I was eavesdropping. [2]

GENERALS

Dryness

~ Eyes. [5 provers]

- Lips [sore and dry], [2 pr.]

=» Mouth/ throat.

- Voice. "My voice is very husky and dry and I sometimes cough; no mucus." = Cough.
- Skin around nose; of face; hands [across knuckles]; feet.

" Nails [dry, breaking, splitting, brittle].

Itchy

= Hair.

« Eyes, worse in corners and outer margins.

<· Back of mouth/ throat; "as if from hayfever."

« Nose; inside and nostrils.

= In spots; transient; as if from fleas or small bugs crawling all over; changing place on scratching.

Offensiveness

~ Putrid taste in mouth [1 pr.]; bitter metallic taste [1 pr.]; slimy bad taste [“teeth never feel as if have cleaned them”] [1 pr.].

=» Flatus. [5 pr.]

» Stool. [3pr.]

= Leucorrhoea. *[2* pr.] [“Very smelly leucorrhoea, yellowy, creamy. Smells like thrush. Cheesy, milky, yeasty smell.”]

« Menses [strong odour], (i pr.]

«= Sweat, armpits [“smelly, damp and pungent”]. [2 pr.]

Food & Drink

·» Cravings: potatoes [i pr.]; chocolate [i]; garlic [1]; brown rice [1]; hot spicy food [1]; fruit and juicy things [1]; meat [i]; salted peanuts [i]; eggs [1].

=» Thirst [4 pr.].

Sleep

«· Overwhelming drowsiness; in afternoon or evening. [8 pr.]

[Lichens become dormant when there is little water or light. They can begin to grow again even after very long periods of dormancy. Lichens go through alternating periods of dormancy and metabolic activity each day, with the hours between noon and 6 p.m. typically being the time of day when they are least likely to be active.]

Senses acute or altered [6 provers]

Fruticose lichen. Cool, moist climates. Fragile, brittle and small. Fragmentation; scattered and disorganized. Used, duped or trapped. Dirt; cleaning and organizing. Afternoon sleepiness.

Suddenly blinded as if had stared into the sun, lasted for half an hour, worse on right side with flickering around the edges - everything seemed white, really couldn’t see very well. [7]

<■ Lights are very bright. When driving down the motorway to get to the restaurant, the other cars’ lights were very dazzling, very intense and beautiful. [15]

= Immediately after taking the remedy, I could suddenly hear the clock ticking in the room -1 had previously been unaware that there even was a clock in the classroom. My hearing felt extremely acute, as if I was suddenly tuned in’ to a new frequency. [1]

I became very irritated by two women chewing gum - the noise of their chewing & slurping was unbearably loud. [1]

== Feel nauseous. Sense of smell very acute, notice odd smells around when

out with daughter. ... At the seaside. Noticed odd smells around again. This time distinctly like manure, farmyard, cowdung. Asked a woman pedestrian if she could smell anything funny and she gave me a very odd look. [14]

=» Smell garlic. ... Heightened sense of smell in the pub - stronger. Music seems very loud in the pub. [17]

=» Smell of garlic after coughing. [9]

«· Everything seems saltier. Baked beans seemed so salty one evening that I was nearly sick. [9]

PHYSICALS

Headache related to sinuses [5 provere]

« Pain in left eye and behind nose. Sinuses felt hot and as if there were something inside them pressing outwards, worse on the left side. ... Burning pain behind eyes, not connected to the eyeballs, but located more inside the skull. [1]

*> Woke with slight headache - right side. Got worse through day. Extended from forehead to back of head and into side of ear, sort of in straight lines. ... Woke with same headache as yesterday and stuffy right nostril. By evening nose was running and the headache had extended into right ear and teeth. Very intense pain, preventing sleep for much of the night. [2]

= Splitting headache suddenly came on at 11 a.m., more over left eye than right. By 4 p.m. it is a generalised ache all over head especially around back of head and down neck. [3]

«· Headache over right eye [high up forehead]. Dull pressing sensation. Face feels full across sinuses. ... Pressing pain, like a finger pressing over left eye. [7]

« Headache - worse left side. Situated over bridge of nose and extending to left ear. [13]

Headache - head as if in a vice [3 provers]

= As if head was in a vice and congested, with driving pain down through top back teeth from cheek bone. [7]

= Felt like head was in vice with drills driven into the skull. [13]

® Very bad headache. Back of head and down neck like a vice. Stiffness in back of neck. Feels a bit better after lunch. [17]

Headache accompanied by images [2 provers]

~ Really bad headache. ... Close my eyes and see lots of faces changing from one face to another. Also feel like I am on the verge of seeing something but it is not quite revealing itself, [io]

= Headache, lasting 8 hours. ... Bizarre images in head on closing the eyes. Flashing kaleidoscope of colour. Images of burned limbs. High temperature and fever, swollen glands. Fear of death and meningitis. Panic attack. [13]

Nose and sinuses [5 provers]

= Nose quite blocked. Lots of clear thick mucous on blowing it. Feels as though it's obstructed by something solid. Can't breathe through it. [1]

« Sensation as if I'm holding something very cold, maybe a lump of ice, against either side of the bridge of my nose. When I move my head, the air moving against my face increases the sensation of cold, [i]

= Skin round nose feels dry. Sensation as if nasal bones are protruding. ... Nose blocked at night, p]

Face felt very full and watery. Sinuses felt full - felt a pressure on front of cheeks as if someone's fingers were pressing there. Nose slightly running - sniffing. Started salivating. [7]

<·> Sinuses running alter a week of being blocked up. [9]

= Immediately after remedy nose started to run and mouth salivate. [17]

Bloating and flatulence [8 provers]

Bubbling sensation; belching and burping. ["As if I've drunk lots of fizzy soft drinks."]

Must loosen clothing.

Upper extremities

= Numbness and tingling in right hand [awaking from it] p pr.]

- Waking up with sensation in hands as if blood supply has been cut off. [1 pr·]

= Pain or sensation of weakness in right wrist, p pr.]

Peculiars

= My hair feels like it's a wig - not attached to my head. Feels like there's a gap between my hair and my head. [15]

=> Very sore throat as if I have swallowed iron filings or glass splinters. [13]

~ Troubled at times by an inability to speak i.e. get my vocal chords to work properly, like a 'frog in the throat'. It is clearable by a very harsh, hard cough but that hurts and does not work very well. It is very embarrassing to try to speak and nothing comes out. [3]

« My voice doesn't sound like it's mine. Feel as if my voice is about to falter, as if my words are about to trip over themselves but I keep nervously chatting anyway. I have this odd feeling of smiling slightly through nerves. [15]

— Feel constricted, as if in a straight jacket, if I bend over feel suffocated. [17] = Must move feet in a swinging motion. [9]

— Glandular fever. I felt exhausted and had to go to bed. My limbs were aching, I had sore joints, ankles, knees, wrists and my neck is stiff. I have a headache which is throbbing and worse bending over. Overnight I was feverish and chilly. This whole scenario feels like a return of glandular fever, which I had in my teens and recurred for a few years - aching limbs and joints, exhaustion, feeling well and then relapsing, headaches with stiff neck and swollen glands. I have even got the swollen gland sensation in my groins, stomach and armpits. [11]

<= Very cold generally; fingernails on both hands blue; > after eating. [7]

= Sensation of a cold draft blowing all around body. [10]

— Feeling very odd, as if asleep, or moving under water. Everything is an effort, even lifting my hand to my mouth to eat is slow and difficult. [1]

= Felt physically close to the ground when out walking. [2]

I B. PARMELIACEAE

Cetraria islandica
Usnea barbata

CETRARIA ISLANDICA **Cetr.**

Scientific name	Cetraria islandica (L.) Ach. 1803.
Synonym	Lichen islandicus L. 1753.
Common names	Iceland Moss. Iceland Lichen.
Family	Parmeliaceae.

KEYS

- Fruticose lichen.
- Cold climates.
- Brittle when dry, tough when slightly moist; soaks up water like a sponge.
- Pulmonary troubles and digestive disturbances.

FEATURES

- Fruticose lichen with a very thin, erect, leafy thallus, branching fanlike into curled or flattened, papery lobes, fringed with minute isidia.
- Cushion-like growth on barren stony or sandy ground, well suited to high winds in harsh environments.
- Upper surface brownish or greenish-brown; under surface greyish and marked with numerous small, white, depressed spots.
- Common in northern countries and in the mountainous [alpine] parts of warmer countries. It is likewise found in the antarctic countries. [In these environments there is little competition from vascular plants.]
- Grows best in direct sun.
- Brittle when dry but tough when slightly moist.
- Swells up slowly in water, absorbing more than its own weight of that fluid.
- Can endure prolonged wet periods.

- Highly flammable when dry.
- When boiled in water the decoction becomes a firm jelly on cooling.
- Yields a brown dye.
- Contains usnic acid as well as other bitter lichen acids; mucilage; iodine; vitamin A [traces].

THERAPEUTICS

• "Excellent in chronic pulmonary troubles, catarrh, digestive disturbances, dysentery, advanced tuberculosis," according to Mrs. Grieve.

Demulcent, tonic, and nutritious. Excessive doses may induce nausea and looseness of the bowels, while ordinary doses improve the appetite, digestion, and general nutrition.

Constipation is not produced by it, and the circulation is unaffected. Its nutritive qualities are undoubtedly due to its starch. The bitterness of cetrarin may be detected in the nursing mother's milk. Used as a demulcent in *chronic catarrhs, chronic dysentery* and *diarrhoea,* and as a tonic in *dyspepsia, convalescence,* and *exhausting diseases.* Boiled with milk it forms an excellent nutritive and tonic in *phthisis* and *general debility.* It relieves the cough of *chronic bronchitis.* Its tonic virtues depend on its cetrarin, the bitter principle which, if removed, renders the lichen merely nutritious.

Fruticose lichen. Cold climates. Brittle when dry, tough when slightly moist; soaks up water like a sponge. Pulmonary troubles and digestive disturbances.

• Due to its high content in mucilaginous polysaccharides, about 50%, the nutritive qualities of Cetraria contribute to the treatment of cachexia [mal- nourishment + debility] and make it an excellent forage for reindeer, mountain goat, moose, and musk-ox. It has long been used as an emergency food in desolate places. Swedish militaries use it as an energy-rich food source during field exercises in Lapland.

• Clarke writes: *"Cetraria* has been used in decoction and as a food, and has been found curative empirically in atrophy, catarrh, diarrhoea, phthisis, scrofulous emaciation, scurvy, and ulcers." Based on these findings he gives as symptoms indicating its use: "Bitter slimy taste. Feels full and satisfied after eating a litde. Habitual vomiting. Chronic diarrhoea [of consumptives]. Frequent catarrhs. Tickling and spasmodic feeling in windpipe on waking.

Copious expectoration. Fetid taste and smell causing nausea. All kinds of bloody expectoration. Weak lungs. Emaciated people."

- Mills considers Cetraria "a prime remedy for inflammations of the stomach wall, as seen in such cases as gastritis, gastric ulceration, hiatus hernia and reflux oesophagitis. It is notably indicated in cases of low-grade stomach infections seen when there is low stomach acid production, but it is also useful in ameliorating the effects of excessive stomach acid secretion."

[Simon Y. Mills, *The Essential Book of Herbal Medicine;* London, 1991]

- In excessive doses or with prolonged use, Cetraria can cause gastric irritation and liver problems.

- In a randomized trial, Iceland moss [0.48 mg per day for five days] was found to prevent both dryness and inflammation of the oral cavity in patients who had undergone surgery of the nasal septum and were subjected to prolonged mouth breathing following surgery.

The Commission E approved Iceland moss to treat irritation of the oral and pharyngeal mucous membranes and accompanying dry cough, and loss of appetite. In an open clinical trial, 100 patients with pharyngitis, laryngitis, or bronchial ailments were treated with lozenges containing 160 mg of an aqueous extract of Iceland moss. The results were determined to be positive in 86 cases with good gastric tolerance and lack of side effects.

[Excerpt from Expanded Commission E Monographs by the American Botanical Council]

- In the opinion of Dr. Gordon Ross both Cetraria islandica and Sticta pulmonaria "should be thought of in cystic fibrosis of children." He also suggests to think of it in cases of diverticulitis, because one of the characteristic Cetraria symptoms was "chronic diarrhoea with slimy taste in the mouth" which are "the usual symptoms of diverticulitis."

[A.C. Gordon Ross, *Two Neglected Remedies;* Homoeopathy, June 1970, Vol. 20, No. 6]

ACID RAIN AND HEAVY METALS

- Long before the discussion about acid rain and atmospheric pollution by heavy metals started, Hahnemann, in 1795 [!], pointed to the value of *Cetraria islandica* in the treatment of "poisoning by metallic vapours" and "poisoning by acrid substances."

Hahnemann evidently possessed remarkable observational and visionary skills because lichens are now known to be effective biomonitors of both heavy metal deposition and acid rain distribution.
Lichens have no roots and therefore do not have access to soil nutrients. They must depend on deposition, water seeping over substrate surfaces, atmospheric and other comparatively dilute sources of nutrients. Thus, their tissue content largely correlates with atmospheric levels of nutrients and contaminants. The lack of an outer cuticle moreover leads to the rapid assimilation of metals, which, in turn, are released or leached out at a far lower rate.
Not all lichens are equally sensitive to elevated tissue concentrations of heavy metals and some species have the ability to accumulate high metal concentrations without apparent damage.
The growth of lichens is inhibited even by small amounts of acid rain. The main components of acid rain are sulphuric and nitric acids, and to a lesser degree, fluorides. With the rising atmospheric levels of such acids many lichens have disappeared from towns and from woods growing in the vicinity of towns or industrial areas.

• From a clinical homeopathic point of view it would make sense to keep lichen remedies in mind for patients with environmental sensitivities resulting in complaints of the respiratory tract and, perhaps, of the gastrointestinal tract. In addition, the themes derived from lichen signatures can be taken into consideration. All five lichen species of the homeopathic materia medica are susceptible to acid rain, while Cladonia and Cetraria are useful for the indication of heavy metals.
The most common pollutants are:

- *Sulphur.* Sulphur dioxide is a by-product of coal or fuel oil combustion, ore reduction, paper manufacture, many industrial processes, and vehicle exhaust. Atmospheric sulphur dioxide is oxidized to form sulphuric acid as a component of acid rain.
- *Nitrogen.* Nitrogen dioxide is mainly produced by fossil fuel combustion by stationary sources and vehicles. Nitrogen dioxide is oxidized to form nitric acid, another component of acid rain.
- *Fluorides.* Fluorides are emitted into the atmosphere as by-products of aluminium and zinc ore reduction plants, fertilizer plants [phosphates],

brickworks, and glass making factories. They can also occur as fly ash from coal-burning installations. Fluorides degrade the photosynthetic pigments of the algal partner, causing chlorosis and ultimately disintegration of the lichen thalli.

• *Plumbum* [lead]. Most important heavy metal pollutant in the atmosphere. Leaded fuel, and any process involving coal combustion or ore reduction are the main sources. Lichens are very efficient accumulators of lead, through aerosols, particulate metal fallout, or acid rain. Once bound, lead is not easily removed by rain or wind. The toxic effects of lead on lichens is minimal. Like many other lichens, Cetraria islandica is known to accumulate lead, which is one of the reasons why the powdered lichen must be soaked in lye for 24 hours or filtered through ash. This was done traditionally in order to extricate lichen acids, but modern studies demonstrate that poorly prepared Iceland moss contains probably toxic levels of lead.

• *Mercury.* Minor component of air pollution from the burning of fossil fuels. Readily accumulated by lichens; extremely toxic to lichens even at low levels.

• *Zinc.* Emitted from zinc smelters and in vehicle exhaust. Found in fairly large concentrations in lichens near zinc smelters.

• *Nickel.* By-product of coal combustion, industrial processes, and vehicle exhaust. Nickel is taken up by algal cells in lichens.

[Data from: www.fs.fed.us/r6/aq/lichen/almanac.htm]

Scientific name	Usnea barbata (L.) Weber ex F.H. Wiggers 1780.
Synonym	Lichen barbatus L. 1753.
Common names	Tree Moss. Old Man's Beard.
Family	Parmeliaceae.

USNEA BARBATA

Usn.

NOTE: Old Mans Beard is also the common name of the climbing plant *Clematis vitalba,* alternatively known as 'Traveller's Joy.

KEYS

- Fruticose lichen.
- Bacteriostatic.
- Protects against UV light.
- Sunstroke; sun <.

FEATURES

- Fruticose lichen growing on trunks and branches of coniferous and deciduous trees.
- Grows on host trees in orchards and damp forests throughout the northern hemisphere.
- Prefers old-growth trees.
- Hangs in long, wispy strands of greyish-green hair from its host.
- The main stem has a slender internal white cord that is elastic when wet and stiff when dry.

TRADITIONAL USE

• Used in folk medicine to increase resistance to colds and influenza, and to treat intestinal conditions. It is reported to be an effective agent against most streptococcus and staphylococcus infections, and for trichomonas in women. A decoction is used in Argentina as a wash for warts. The Maori of New Zealand rub the lichen into powder and use it a remedy for burns and skin eruptions. They also employed it for eczema or ringworm of the scalp and as a healing ointment for old wounds.

SUPPLEMENTS AND THERAPEUTICS

Fruticose lichen.
Bacteriostatic
Protects against UV light.
Sunstroke; sun <.

• Health food supplements containing usnic acid have been promoted for use in weight reduction. The supplements recently made the news in anything but a positive way. Claiming to increase metabolism to help the body to burn off fat, the weight-loss product LipoKinetix, containing usnic acid in the form of sodium usniate, was incriminated in a death from liver failure, two liver transplants and seven cases of [non-fatal] liver failure. The product has been taken off the market, but other products containing usnic acid are still "a buzz in the health and fitness community."

One of the victims felt for the first couple of days when taking usnic acid "pretty warm, like I was doing like an aerobic workout." No other side effects occurred, until the eyes turned yellow accompanied by excessive weakness and tiredness.

The cases are unprecedented and appear to be conflicting with the German Commission E monographs, which state that Usnea has no known side effects and approve its preparations for treatment of mild inflammations of the oral and pharyngeal mucosa. In the United States, it is dispensed to treat urinary tract infections, upper respiratory infections, Candida albicans, and streptococcal throat infections [tonsillitis caused by Streptococcus pyogenes].

MATERIA MEDICA

= The few symptoms Usnea barbata has in the materia medica originate from observations described by Anshutz in *New, Old and Forgotten Remedies.*

> In March 1878,1 was cutting wood. I cut down a soft maple; the top was well loaded with moss. It attracted my attention; I viewed it closely. I ate a little, about the size of a hickory nut, as I trimmed up my tree. My head began to ache. I cut off one log, and had to go to the house. I could feel the blood press to the brain. My wife worked over me, and I got to sleep. Next morning felt well; never felt better. I did not think of the moss I had eaten. I went on a visit and was gone five days. On my return I went to my tree. The first sight of it reminded me of my headache. I gathered some of the moss and made a tincture. I soon had a case of headache to try my remedy on; it stopped at once.

In the fall, about September, a load of young folks came to pick cranberries. Two of the young ladies had headache from riding in the hot sun. Both took the lounge. Now for my remedy. I put one drop of tincture in a goblet of water, gave a teaspoonful; ordered another in fifteen minutes. The second dose stopped the pain.

A young married lady came on a visit to a relative - was having pains in her head. I was sent for; found her wild with pain. She said she had been subject to headache for five years; had got tired of doctoring. Gave her one drop in a cup of water, teaspoonful in twenty minutes; no more pain. I put ten drops in a two-dram vial of alcohol, directed her to take one drop when she felt her headache coming on. One year after she wrote her friend it had cured headache; sent thanks to me.

I could give many more cases where the pain is over the entire head, or front head, with a feeling as if the temples would burst or the eyes would burst out of their sockets. I have always used the tincture. I have not noticed any other effect from it; would like to see a proving.

Usnea fillipendula

Scientific name	Lobaria pulmonaria (L.) Hoffm. 1796.
Synonyms	Lichen pulmonarius L. 1753. Sticta pulmonacea Ach. 1810. Sticta pulmonaria Hook. 1821.
Common names	Tree Lungwort, Oak Lungs.
Family	Lobariaceae.

II. ORDER PELTIGERALES

II A. FAMILY LOBARIACEAE

Sticta pulmonaria

KEYS

- Foliose lichen.
- Prefers areas of strong coastal influences or areas along streams.
- Dryness.
- Flowing; water.
- Flying; floating.
- Housemaid's knee; domestic slave.

FEATURES

- Linnaeus named this lichen *Sticta* after its appearance [Gr. stiktos = spotted]. It should not be confused with a vascular plant in the Borage family with the same name - Sticta pulmonaria, or Pulmonaria officinalis, also known as 'Lungwort' because of the signature of the leaves.
- Foliose lichen with forked irregular lobes, somewhat resembling oak leaves.
- Forms spreading sheets, pitted with depressions.
- Upper surface pale green when dry and a very bright green when moist.
- Disperses by means of soredia or isidia.
- Found throughout Europe and North America, growing on deciduous or

coniferous trees and on rocks in lower elevation forests.

- Prefers areas of strong coastal influence or areas along streams.
- Contains various plant acids, fatty acids, mucilage and tannins.
- The ash contains phosphorus, sulphur, manganese, and boron.

TRADITIONAL USE

- Has been used since ancient times as a remedy for lung problems, as well as to treat wounds, ulcers, metrorrhagia, dysentery and 'bitter vomiting'.

- The Gitksan Indian in British Columbia associated Lobaria pulmonaria with frogs and used it in a spring bathing ritual to bring health and long life. In Europe the lichen was used as a substitute for hops in beer brewing; also used instead of hops in Russian and Siberian monasteries which served bitter and highly intoxicating beer to travellers. Other applications include its use as a source of orange-brown dye for wool; for curing eczema on the head and cleaning hair, in Darjeeling and Sikkim; as a traditional medicine to treat arthritis in British Columbia; as a remedy for lung troubles, haemorrhages and asthma in Darjeeling and Sikkim; in French perfumes; and for tanning hides.

[Database on Human Use of Lichens; www.lichen.com]

MATERIA MEDICA

Provings

[1] Burdick, self-experimentation, 1859; three doses of strong tincture over three days.

[2] Lutes, self-experimentation; increasing doses of 2x and lx, both without effect, then increasing doses of tincture over three days.

[3] Dewey, 8 provers [6 males, 2 females], *c.* 1900; method unknown.

Affinities

= Mucous membranes of the respiratory tract. Joints [wrist; right shoulder; ankle; knee].

SYMPTOMS

Dryness.

» Nasal discharges drying up.

Sticta coryza is stricdy dry. The excessive and painful dryness of the mucous membrane is not due to any want of secretion; for secretions occur but they dry up very rapidly leaving thick crusts behind them. The whole of the buccal cavity and the throat are so dry, parched and leatherlike that our patient finds it hard to sleep. He sits up all night, unfortunate man sneezing and coughing. It is only towards the latter part of the morning when the palate and the throat get a bit moistened that he is able to sleep.

» Soft palate feels like dry leather, causing painful deglutition.

= Clergyman's sore throat [laryngitis], characterized by great dryness of mucous membranes. [Hering]

<■ Dry cough; incessant; < at night; can neither sleep nor lie down, must sit up.

Sticta will often cure coughs left by measles, whooping-cough, influenza, colds. [Clarke]

·» Preventing the drying up of breast milk.

Rogers prescribed Sticta for a patient with a cough. At the time of the remedy she was nursing her seventh child. She had always been annoyed because of a scantiness of milk; it had been occasionally entirely suppressed. While taking Sticta the flow became ample, and remained so as long as an occasional dose was being taken. Rogers subsequently verified this effect in a number of cases. [Clarke]

Flowing/ water.

«■ Great thirst. [Drinks often but not large quantities; in hay fever].

«· Free discharges >. Must talk.

= Fear of water. [Mangialavori]

- Painful menses; the less the flow, the greater the pain. [Mangialavori]

Floating/ flying

= Head as if floating off: Sensation of skull being raised and lowered.

=> Leg feels as if floating in the air.

[A minute after taking the lx dil.] she said her left leg felt as though it was floating in the air, feeling light and ethereal, without any sensation of resting on her bed. " [Hughes; clinical case]

«· Wanting to fly away.

After taking it she [Bella, 12 years old] got very lively. Told her father she felt as if she would like to strike out, only for fun; she would like it just for the fun of it. After a little while she lay down on the lounge and began - to use a common expression - to kick up her heels. Her mother reproachfully said, "Bella, do behave, that is not lady-like." When the child responded, "Ma, I cannot help it; I feel exactly as iff wanted to fly away." [Lilienthal; clinical case]

■» Dreams of flying.

Joints

= Hale, in *New Remedies,* gives five cases of 'rheumatism' cured by Sticta [all with repeated doses of lx dil.].

=> *Case I. Male; aged 45.* During the latter part of last Winter and the forepart of Spring, suffered severely with rheumatism in right shoulder joint, deltoid and triceps muscles extending at times to the forearm, commencing to pain me in the night. Toward morning, my arm becoming nearly helpless, could not put on my coat without help; during the day lameness nearly disappearing; this condition lasting nearly two months; no heat or swelling. Cimicifuga racemosa, Phytolacca decandra and Colchicum were used in succession in small and larger doses, with but temporary relief. I now resolved to try Sticta, first dilution, four drops for or five times per day. Improvement commenced at once. Discontinued medicine in a few days; difficulty permanently removed.

« Case II. Edward P, aged 48, rheumatism is the right ankle joint, swollen

and very painful, could only get around with the help of a cane; and applied domestic treatment for several days, without benefit. Gave him a dram vial of Sticta 1st, dose four drops five times a day; cured in four days. Says he used no other medicine.

= *Case III. Mrs. C, aged 41;* taken very suddenly with pain reaching through the chest from sternum to spinal column; constant, < movement; the arms powerless from extreme pain, if an attempt was made to move them. Gave Sticta 1st, three drops five times a day. The first dose gave relief; well in three days. Together with the above symptoms, there was difficult breathing and speaking for some time. Treatment commenced about twelve hours after attack. In these cases no other medicine was used to my knowledge.

Foliose lichen.
Prefers areas of strong coastal influences or areas along streams.
Dryness.
Flowing; water.
Flying; floating.
Housemaid's knee; domestic slave.

= *Case IV. Mr. F, aged 50 years,* came to me, saying he had rheumatism all over him, and could get no relief; said he had tried everything, had been to two or three allopathic physicians, but was getting worse every day. His troubles commenced about six months ago, with sharp, darting, lancinating pain, first in the knee joints, then in the elbow and shoulder. The finger joints were next involved, and it gradually extended to every joint in the body; the pain in the neck and head were intense. At the present time the joints are all swollen and stiff. He cannot sleep for the pain, and can scarcely walk. By comparing the above with the provings of Sticta pulmonaria, I found a perfect type of the disease before me in this drug, and I at once determined to test its curative power; the following are the results; I gave Sticta 1st, five drops to a tumbler of water, tablespoonful to be taken every hour. Aug. 23. Mr. F. reports himself greatly improved; pains not so severe - has slept better. Sticta 1st, as before.

Aug. 26. Reports a great deal better; can walk better than at any time during the past five months; pain in the head and neck gone; all the pains are less severe, and the joints are not so much swollen. Continued Sticta 1st, as before. Aug. 28. Reports himself entirely well; has no pain; swelling all gone; says he feels better than at any time during the past nine months; stiffness of the joints all gone; he is getting young again, and walks as sprightly as a young man.

= *Case V. Mrs. G., aged 40,* rheumatism of the wrist joints. She has been under treatment for nearly three months, with very little if any improvement. The wrists and hands with but little redness; very painful on moving them. I had given her nearly all the remedies that are usually given in

rheumatic troubles; none of them had afforded relief to any extent. After the results produced in the last case by Sticta, I determined to try it in the case of Mrs. G. I accordingly gave her five drops, 1st, in a tumbler of water, a teaspoonful every two hours. On the day after I called, and on entering the room she exclaimed, "Doctor, you have done it this time !" To my great surprise I found her sewing. The pain and swelling were nearly gone. Sticta 1st was continued for a few days, and the cure was permanent.

HOUSEMAID'S KNEE & DOMESTIC SLAVES

= In 1867, Simon Schwendener shocked the mycological world by proclaiming that lichens were not the distinct organism they had long been thought to be, but rather were formed of two separate organisms. Leading mycologists were outraged at the radical idea. Mordecai Cooke, an authority at that time, denounced the concept of dualism as "unqualified romance which a future generation will contemplate as fairy tales." Yet, "the hallucination of the high priest Schwendener," proved to be correct, although it took the scientific world 50 years to accept it. With time it also became clear that the definition of lichens as symbiotic consortiums of fungal and photosynthetic partners is too narrow. Several forms of habitual cohabitation of separate organisms exist, ranging from *parasitism,* a relationship in which the parasite depends on its host; *commensalism,* an independent and mutually beneficial relationship; and *helotism,* a master-slave relationship.

With commensalism at one end and parasitism at the other, lichens, homeopathically, reflect a process of dynamic interaction involving the qualities of connectedness and cooperation. Lichens have both themes in common with fungi, which also entertain symbiotic or parasitic associations with specific hosts. That leaves us theoretically with the theme of *helotism* as more typical for lichens. Helotism is a type of symbiosis, in which one species, the fungus, is dominant and makes the member of another species, the alga, perform the tasks required for their mutual survival.

A slave can be defined as "a person kept as property, usually made to work as a servant; a person who is submissive under domination; a person who is submissively devoted to another; a person whose will has lost power of resistance; a person who works extremely hard, as if in bondage, a drudge." [Chambers Dictionary]

In an article entitled *'De huissloof* in the Dutch homeopathic journal *Dynamis,* Anton Kramer and Alex Leupen consider the *housemaid's knee* "a discomfort that fits extremely well into the picture of *Sticta:* the domestic slave [or household drudge]." Housemaid's knee, bursitis in the knee, owes its name, says Raue, to "its frequent occurrence among female servants, who induce it while working in a kneeling position." Household drudges slave away on their knees for others, without asking much for themselves. Metaphorically, to bend or bow the knee denotes an inclination to submit and yield.

Kramer en Leupen present two cases. The first case [Kramer] concerns an obese woman of 49 years with fibromyalgia, manifested by pain and stiffness in arms, shoulders and back. The complaints occupy her mind; she asks many questions and talks rapidly, changing quickly from one subject to another. Buttocks and legs [especially posteriorly] are very cold, with a sensation as from ice cubes lying there. The sensation is worse up to two hours after stool. Also the groin feels cold, as if she is sitting in a draft.

She has always been a busy person. Her father and mother live across the street, and her mother constantly controls her life: she is domineering and descends on her every other minute to make comments on housekeeping and raising the children. The mother has abused her emotionally and made her do all the dirty work. ... The patient has the feeling that her mother not only invades her house, but also her whole being and that she sees and decides everything. ...

Generals: Intolerance of lettuce, mushrooms, [button mushrooms], and sugar [she used to get warm and hyper from it]. Chilly; sensitive to rain, wind and drafts. Treatment with Calcarea muriatica, followed by Oxalicum acidum, gives much improvement, but the Baker's cysts in the popliteal spaces remain and become bothersome. Repetition of Oxalicum acidum is without effect. Now *Sticta pulmonaria* is prescribed, based on the bursae and on the experience that this type of complaint matches the type of person: this patient thinks that she is her mother's domestic slave.

The *Sticta* brings major changes about, such as taking initiatives at home and in her job, independence, making her own decisions instead of letting others rule her life, and she has stopped yielding to her mother. "I won't be trifled with anymore." The cysts, fibromyalgia and chilliness are much better and she has lost 15 kilos in weight.

The second case [Leupen] concerns a 51-year old woman with a pressing

sensation in the right ear; swollen cervical lymph nodes [anterior, right side]; heavy sensation at the nose; scanty nasal discharge. Cant tolerate wind blowing on her ears. Fear of cancer. Multiple ear inflammations as a child. Other symptoms: Headache above left eye before menses; frequently cystitis, worse after much sex. Vegetarian; "I don't eat living creatures with emotions." Thirsty [tea and water]. Dreams of flying. She says: "I used to be a drudge, I was slavish, but at the insistence of my husband I have done an assertiveness training." ... Restless, wants to travel. Loves to be en route. Does yoga and meditates and describes this as "travelling within myself." Discontent: "Stagnation means decline." 'Dependence-independence' is another theme in her life.

The domestic slave-theme fits with *Sticta,* a remedy further confirmed by the dreams of flying [Sticta also has the sensation of flying], and by the physical symptoms. The complaints disappeared after one dose of *Sticta,* never to return [five years later].

[Anton Kramer, MD, & Alex Leupen, MD, *De huissloof: De Materia Medica van Sticta pulmonaria;* Dynamis, Nr. 30, June 2002]

Addendum

AGARICUS PHALLOIDES (from page 77)

(= Amanita phalloides)

Proving by Peter Konig, MD, and Diana Konig, MD, Austria; 18 provers [17 females, 1 male], 30c; 2005-06. [Remedy made by Remedia, Eisenstadt, Austria.]

Suggested repertory rubrics

N= New symptom / repertory rubric (MacRepertory Pro 6.1.5)
CS = Confirmed symptom — symptom already listed in materia medica
A = Agar. (Amanita muscaria) already listed in this rubric, including small rubrics

MIND; ABSENT-MINDEDNESS (A)
MIND; BUOYANCY
MIND; CHEERFULNESS, gaiety, happiness; tendency (A)
MIND; COMPANY; aversion to, < (A)
MIND; CONCENTRATION; difficult (A)
MIND; CONFUSION of mind (A)
MIND; DREAMS; animals; dogs
MIND; DREAMS; apparatus for spirometrical examinations, breath too cold (N)
MIND; DREAMS; blood
MIND; DREAMS; body parts; back
MIND; DREAMS; body parts; back; bloody (N)
MIND; DREAMS; body parts; hands; cut off (NJ
MIND; DREAMS; body parts; mouth, opening impossible; vulnerable, bleeding excrescences growing out from palate (N)
MIND; DREAMS; cancer
MIND; DREAMS; cancer; healed with a diamond (N)
MIND; DREAMS; death
MIND; DREAMS; death, her own death (N)
MIND; DREAMS; death, her own death, having just died (N)
MIND; DREAMS; disaster

MIND; DREAMS; earthquake
MIND; DREAMS; earthquake; impending (N)
MIND; DREAMS; events of previous day
MIND; DREAMS; exciting
MIND; DREAMS; family, own
MIND; DREAMS; family, own; brother (N)
MIND; DREAMS; family, own; sister (N)
MIND; DREAMS; family, own; uncle and aunt (N;
MIND; DREAMS; healed with a diamond IN)
MIND; DREAMS; man, wants to be a <N)
MIND; DREAMS; many (A)
MIND; DREAMS; pregnant, of being
MIND; DREAMS; pursued, of being
MIND; DREAMS; unsuccessful efforts to do various things
MIND; DREAMS; vivid (A)
MIND; FORGETFULNESS (A)
MIND; INDOLENCE; aversion to work (A)
MIND; IRRITABILITY (A)
MIND; JEALOUSY
MIND; JUMPING; impulse to jump into cold water (N;
MIND; MEMORY; weakness, loss of; for what he was about to do
MIND; NATURE, needs to relax in nature; wants to go out into (N)
MIND; PROSTRATION of mind, mental exhaustion, brain fag (A)
MIND; QUIET; wants to be
MIND; SADNESS, despondency, depression, melancholy (A)
MIND; SENSITIVE, oversensitive (A)
MIND; SLOWNESS
MIND; TALK, talking, indisposed to talk, desire to be silent, taciturn (A)
MIND; TOUCHED; aversion of being (A)
MIND; VIVACIOUSNESS (A)
VERTIGO; VERTIGO (A)
VERTIGO; MORNING (A)
VERTIGO; NIGHT; bed, in
VERTIGO; HEADACHE; through, as if (N)
VERTIGO; MUSIC < (N)
VERTIGO; NOISE < (N)
VERTIGO; OBJECTS seem to turn in a circle (A)
VERTIGO; SUDDEN (A)
VERTIGO; TURNING in bed, on

VERTIGO; WEAKNESS, with
VERTIGO; WEAKNESS, with; has to hold on to table in order not to fall down (N)
HEAD; PERSPIRATION, Scalp; evening
HEAD; PERSPIRATION, Scalp; evening; sudden (N)
HEAD PAIN; GENERAL; lying, while; < (A)
HEAD PAIN; GENERAL; periodical; every Sunday
HEAD PAIN; LOCALIZATION; Forehead; lying, while <
HEAD PAIN; PRESSING (A)
HEAD PAIN; PRESSING; above, from (N)
HEAD PAIN; PRESSING; helmet, like a <N;
HEAD PAIN; PRESSING; Forehead (A)
HEAD PAIN; PULSATING, throbbing (A)
HEAD PAIN; PULSATING, throbbing; nausea, with
HEAD PAIN; PULSATING, throbbing; Forehead
HEAD PAIN; STITCHING (A)
HEAD PAIN; STITCHING; icicles, as from (N)
HEAD PAIN; STITCHING; Temples (A)
HEAD PAIN; STITCHING; Temples; right (A)
EYE; HEAVINESS (A)
EYE; HEAVINESS; lids (A)
EYE; ITCHING (A)
EYE; ITCHING; right (N)
EYE; OPEN lids; unable to
EAR; PAIN; stitching (A)
EAR; PAIN; stitching; right (A)
EAR; STOPPED sensation (A)
EAR; STOPPED sensation; right
NOSE; EPISTAXIS (A)
NOSE; EPISTAXIS; morning (A)
NOSE; EPISTAXIS; blowing nose, from (A)
NOSE; EPISTAXIS; blowing nose, from; morning (A)
NOSE; ERUPTIONS, inside; pimples
NOSE; ERUPTIONS, inside; pimples; wings, on
SMELL; ACUTE (A)
SMELL; ACUTE; meat, spoiled (N)
SMELL; ACUTE; perfumes, for (NJ
SMELL; ODOURS, imaginary and real; fruit pie <NJ
SMELL; ODOURS, imaginary and real; meat; burnt (N)
SMELL; ODOURS, imaginary and real; meat; hunger, with (NJ

SMELL; ODOURS, imaginary and real; meat; raw (N)
SMELL; ODOURS, imaginary and real; old, odours from the past (N)
SMELL; ODOURS, imaginary and real; poultry (N)
SMELL; ODOURS, imaginary and real; sausages, salami <N)
FACE; ITCHING (A)
FACE; ITCHING; eyes, under
FACE; WRINKLED; forehead; sensation of
MOUTH; COLD, objective; breath (cs)
[Symptom appearing in dream in Agar-ph. Proving.]
MOUTH; DISCOLORATION; white; tongue; base
MOUTH; DRYNESS (A)
MOUTH; INDENTED; Tongue
MOUTH; MUCOUS membrane; excoriation
MOUTH; PAIN; burning, raw, smarting; tongue (A)
MOUTH; PAIN; burning, raw, smarting; tongue; edges (A)
MOUTH; PAIN; burning, raw, smarting; tongue; tip (A;
MOUTH; SWELLING; Tongue
MOUTH; SWELLING; Tongue; sensation of; wanting, but sensation of swelling <N>
THROAT; DRYNESS; < swallowing
THROAT; INFLAMMATION, sore throat; Tonsils
THROAT; PAIN; General; > after eating
THROAT; PAIN; General; swallowing (A)
THROAT; PAIN; General; swallowing; right (N)
THROAT; PAIN; sore, bruised
THROAT; PAIN; sore, bruised, > eating
THROAT; PAIN; stitching (A)
THROAT; PAIN; stitching > eating
THROAT; PAIN; stitching < swallowing
THROAT; SUPPURATION; Tonsils
STOMACH; APPETITE; increased, hunger in general (A;
STOMACH; APPETITE; increased, hunger in general; noon
STOMACH; APPETITE; increased, hunger in general; odours, with imaginary or increased
<N>
STOMACH; APPETITE; wanting (A)
STOMACH; ERUCTATIONS (A)
STOMACH; ERUCTATIONS; nauseous
STOMACH; ERUCTATIONS; nauseous; food, talking of seafood (N)
STOMACH; HEARTBURN (A)

STOMACH; NAUSEA (A)
STOMACH; NAUSEA; food; talking of food, of seafood, with eructations (N)
STOMACH; NAUSEA; headache, during
STOMACH; NAUSEA; talking, while; seafood, about, with eructations (N)
STOMACH; PAIN; General; hunger; feeling, with a feeling like, but not > eating (N)
STOMACH; PAIN; cramping, griping, constricting <cs;
STOMACH; THIRST (CS)
STOMACH; UNEASINESS (A)
STOMACH; VOMITING (CS)
ABDOMEN; DISTENSION (CS)
ABDOMEN; DISTENSION; sensation of (A)
ABDOMEN; PAIN (CS)
ABDOMEN; PAIN; General; sudden
ABDOMEN; PAIN; cramping, griping, colic (A)
ABDOMEN; PAIN; cramping, griping, colic; > bending double
ABDOMEN; PAIN; cramping, griping, colic; > after stool (A)
ABDOMEN; PAIN; cramping, griping, colic; sudden
ABDOMEN; PAIN; cramping, griping, colic; hypogastrium (A)
ABDOMEN; PAIN; cutting (A)
ABDOMEN; PAIN; cutting; > bending double
ABDOMEN; PAIN; cutting; > after stool (A)
ABDOMEN; PAIN; cutting; sudden (N)
ABDOMEN; PAIN; cutting; hypogastrium (A)
ABDOMEN; PAIN; stitching, sticking, etc. (A)
ABDOMEN; PAIN; stitching, sticking, etc.; > bending forward (N)
ABDOMEN; PAIN; stitching, sticking, etc.; sudden (N)
RECTUM; CONSTIPATION; insufficient, incomplete, unsatisfactory stools
RECTUM; CONSTIPATION; insufficient, incomplete, unsatisfactory stools; urging, after strong urging for stool (N)
RECTUM; DIARRHOEA (CS)
RECTUM; FLATUS (A)
RECTUM; FLATUS; menses, during; days, first (N)
RECTUM; FLATUS; offensive (A)
RECTUM; FLATUS; offensive; fetid
RECTUM; FLATUS; retained in rectum; painful (N)
RECTUM; URGING, desire; frequent
STOOL; HARD; first; soft, then; diarrhoea, then (N)
STOOL; ODOUR; offensive (A)

BLADDER; URINATION; involuntary; when sneezing
URINE; COLOUR; dark (A)
URINE; COLOUR; dark; morning
URINE; COLOUR; orange (N)
URINE; COLOUR; orange; morning (N)
FEMALE; SEXUAL; desire; diminished
FEMALE; SEXUAL; desire; increased (A)
LARYNX & TRACHEA; PAIN; General; larynx; with loss of voice (N)
LARYNX & TRACHEA; PAIN; stitching; larynx
SPEECH & VOICE; VOICE; lost
RESPIRATION; ASTHMATIC (A)
RESPIRATION; ASTHMATIC; night
RESPIRATION; ASTHMATIC; autumn, in
RESPIRATION; ASTHMATIC; exertion, after
RESPIRATION; ASTHMATIC; weather; change of, with
RESPIRATION; ASTHMATIC; weather; cold
RESPIRATION; ASTHMATIC; winter attacks
CHEST; PAIN; General; inspiration, during < (A)
CHEST; PAIN; General; mammae; nipples (A)
CHEST; PAIN; stitching (A)
CHEST; PAIN; stitching; muscles
CHEST; PAIN; stitching; sides; right (A)
CHEST; PALPITATION heart (A)
CHEST; PALPITATION heart; lying, while < (A)
CHEST; PALPITATION heart; lying, while <; starting from lying, > sitting up (N)
CHEST; SENSITIVE; Mammae; nipples
CHEST; WARTS; axilla; pedunculated, dark (N)
BACK; PAIN; General; lumbar region, lumbago; left
BACK; PAIN; General; lumbar region, lumbago; evening
BACK; PAIN; General; lumbar region, lumbago; sitting < (A)
BACK; PAIN; General; lumbosacral region (A)
BACK; PAIN; General; sacral region; left (N)
BACK; PAIN; General; sacral region; evening (A)
BACK; PAIN; General; sacral region; sitting; while <(A)
BACK; PAIN; General; sacral region; walking, while < (A)
BACK; PAIN; General; sacral region; gluteal insertion, walking < (N)
BACK; PAIN; pressing; lumbar region (A)
BACK; PAIN; pressing; lumbar region; evening
BACK; PAIN; pressing; lumbar region; sitting

BACK; PAIN; pressing; sacral region (A)
BACK; PAIN; pressing; sacral region; sitting, while (A)
BACK; PAIN; tearing; lumbar region (A)
BACK; PAIN; tearing; lumbar region; right
BACK; PAIN; tearing; lumbar region; rising, on
EXTREMITIES; CRAMPS; Leg; calf; night
EXTREMITIES; ERUPTIONS; itching (A)
EXTREMITIES; ERUPTIONS; itching; hand
EXTREMITIES; ERUPTIONS; pimples (A)
EXTREMITIES; ERUPTIONS; pimples; elbow
EXTREMITIES; HEAVINESS, tired limbs; Lower Limbs (A)
EXTREMITIES; NUMBNESS, insensibility; Fingers (A)
EXTREMITY PAIN; UPPER LIMBS; Elbow (A)
EXTREMITY PAIN; UPPER LIMBS; Elbow; bend of
EXTREMITY PAIN; UPPER LIMBS; Elbow; bend of; bending arm (N)
EXTREMITY PAIN; UPPER LIMBS; Elbow; bend of; taking hold of anything (N)
EXTREMITY PAIN; UPPER LIMBS; Elbow; tendons and muscles, insertions, attachment of (N)
EXTREMITY PAIN; UPPER LIMBS; Hand (A)
EXTREMITY PAIN; UPPER LIMBS; Hand; left
EXTREMITY PAIN; UPPER LIMBS; Hand; motion <
EXTREMITY PAIN; UPPER LIMBS; Fingers; first, thumb (A)
EXTREMITY PAIN; UPPER LIMBS; Fingers; first, thumb; right
EXTREMITY PAIN; LOWER LIMBS; Hip (A)
EXTREMITY PAIN; LOWER LIMBS; Hip; right (A)
EXTREMITY PAIN; LOWER LIMBS; Knee (A)
EXTREMITY PAIN; LOWER LIMBS; Toes; first (A)
EXTREMITY PAIN; LOWER LIMBS; Toes; first; walking, while
EXTREMITY PAIN; LOWER LIMBS; Toes; first; ball of
EXTREMITY PAIN; LOWER LIMBS; Toes; first; ball of; treading, when (N)
EXTREMITY PAIN; SQUEEZED, as if; Knee; nerve squeezed, as if (N)
EXTREMITY PAIN; STITCHING; Knee (A)
EXTREMITY PAIN; STITCHING; Knee; right (N)
EXTREMITY PAIN; STITCHING; Toes; first (A)
EXTREMITY PAIN; STITCHING; Toes; first; walking, while
EXTREMITY PAIN; STITCHING; Toes; first; ball
EXTREMITY PAIN; STITCHING; Toes; first; ball; treading, when (N)
SLEEP; DISTURBED (A)

SLEEP; RESTLESS (A)
SLEEP; WAKING; midnight; after; 2 a.m. until 3 a.m.
PERSPIRATION; MORNING; bed, in
SKIN; ERUPTIONS; pimples; bleeding
SKIN; ERUPTIONS; vesicular (A)
SKIN; ITCHING (A)
SKIN; WARTS; pedunculated
SKIN; WARTS; pedunculated; dark (N)
GENERALITIES; FOOD and drinks; alcohol, alcoholic drinks; aversion
GENERALITIES; FOOD and drinks; eggs; desires (A)
GENERALITIES; FOOD and drinks; fast food; desires (N)
GENERALITIES; FOOD and drinks; fats and rich food; desires
GENERALITIES; FOOD and drinks; food in general; aversion to, loathing to (A)
GENERALITIES; FOOD and drinks; marjoram tea; desires (N)
GENERALITIES; FOOD and drinks; meat; desires; fat
GENERALITIES; FOOD and drinks; milk; desires; cold
GENERALITIES; FOOD and drinks; sweets; desires
GENERALITIES; FOOD and drinks; sweets; desires; dainties
GENERALITIES; HEAT; flushes of (A)
GENERALITIES; HEAT; flushes of; forenoon <
GENERALITIES; HEAT; flushes of; downward
GENERALITIES; HEAT; flushes of; without perspiration; despite sensation of (N)
GENERALITIES; HEAT; vital, lack of (A)
GENERALITIES; HEAVINESS
GENERALITIES; LASSITUDE; tendency (A)
GENERALITIES; PAIN; General; joints (CS)
GENERALITIES; PAIN; cramping (CS)
GENERALITIES; PAIN; stitching (A)
GENERALITIES; SIDE; left (A)
GENERALITIES; SIDE; right (A)
GENERALITIES; SUDDEN manifestations
GENERALITIES; WEAKNESS, enervation, exhaustion, prostration, infirmity <cs)
GENERALITIES; WEAKNESS, enervation, exhaustion, prostration, infirmity; vertigo, with
GENERALITIES; WEARINESS; tendency (A)

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Acladium castellani [= Pseudallescheria boydii] Aclad. A
• Dark grey to dark brown mould.
• Polluted water, sewage, manure.
• Invasion through penetrating wounds.
• Near-drowning; aspiration of polluted water.
• Resembles aspergillosis.
• Rising occurrence in immunocompromised patients.

Agaricum acidum Agar-ac. R - 6
• Component constituent of Polyporus [Fomitopsis] officinalis.
• Identical to agaricin.
• Debilitating night sweats.
• Addiction to excessive use of tea, coffee, or tobacco.

Agaricus [= Amanita muscaria] Agar. R - 6201
• Mutualistic [symbiotic].
• "Esteemed by both maggots and mystics."
• Accumulates vanadium.
• Two sides: growing smaller or taller.
• Fearless or fearful.
• Increased strength.
• Enterprising.
• Visual sensory misperceptions.
• Death-dreamer; dream warrior.
• Fly-induced activity.
• Intercourse.

Agaricus bisporus Agar-bi. N
• "Champignon"; supermarket mushroom.
• Saprophytic.
• Very common under cypress.
• Allergic reactions.
• Oestrogen.

Agaricus blazei Agar-bl. N
• Favours warm and humid conditions.
• Likes the sun.
• Loves thunderstorms.
• Saprophytic.
• Benzoic acid.

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KEYS TO THE FUNGI AND FUNGAL COMPOUNDS

The following are Keynotes for the Fungi remedies, in alphabetical order.

A = Abbreviation only, no symptoms.
R = Number of symptoms in Radar 9.2.
N = New remedy.

• Balance between deficiency and excess.
• Sensation of being under attack.

Agar-cpn. R - 3

Agaricus campanulatus [= Panaeolus campanulatus]
• Saprophytic.
• Brittle and fragile.
• Cap cracked and scaly from exposure to sunlight.
• Coprophilous; seeks nitrogen.
• Grows in families with other dung-loving species.
• Hilarity. Effervescence.
• Impulse to run, jump or dance.
• Distortion of time sense.
• Effects stand midway between Agaricus and Psilocybe.

Agar-cps. R - 11

Agaricus campestris
• Wild cousin of the supermarket mushroom.
• Saprophytic.
• Accumulates cadmium and mercury.
• Gastrointestinal symptoms.

Agar-cit. R - 4

Agaricus citrinus [= Amanita citrina]
• Mutualistic [symbiotic].
• Pronounced smell of raw potatoes.
• Bufotenin. Toadstool.
• Cholera.
• Sopor and lethargy.

Agar-em. R - 20

Agaricus emeticus [= Russula emetica]
• Saprophytic.
• The Sickener.
• Loses all colour from exposure to strong sunlight.
• Brittle; shatters and snaps.
• Choleraic gastrointestinal disorders.
• Anxiety in stomach [deathly nausea], > ice-cold water.
• Resembles acute phosphor poisoning.
• Smell of vinegar <.

Agar-pa. R - 20

Agaricus pantherinus [= Amanita pantherina]
• Mutualistic [symbiotic].
• Loss of coordination and muscular twitching stronger than in Amanita muscaria.
• Twilight zone between thinking and dreaming.
• Fearless. Feeling of going to die but unafraid.
• Unresponsive to pain.
• Lethargy alternating with periods of manic behaviour.
• Compulsive repetition of risky behaviour.
• Disorientation.
• Ataxia.

Agar-ph. R - 75

Agaricus phalloides [= Amanita phalloides]
• Mutualistic [symbiotic].
• Avoids colder localities.
• Smell of raw potatoes or chlorine.
• Gastric type or cerebral type of poisoning.
• Period of relative well-being followed by drama of organ failure.
• Inability to express feelings by words.
• Severe gastrointestinal cramps.
• Marked chilliness.
• Unquenchable thirst.

Agaricus procerus [= Macrolepiota procera] Agar-pr. R - 8
• Saprophytic.
• Brown scales and patches.
• One of the very best of all edible agarics.
• Homeopathic symptoms almost certainly due to misidentification of species.

Agaricus rubescens [= Amanita rubescens] Agar-r. A
• Mutualistic [symbiotic].
• The blusher; stains red when bruised.
• Anaemia.
• Disturbance of sensory functions.

Agaricus semiglobatus [= Stropharia semiglobata] Agar-se. R - 6
• Saprophytic.
• Coprophilous [dung-loving].
• Grows in families with other dung-loving species.
• Incoordination.
• Space and time distortion.

Agaricus stercorarius [= Stropharia stercoraria] Agar-st. R - 13
• Saprophytic.
• Coprophilous [dung-loving].
• Grows in families with other dung-loving species.
• Disorientation.
• Disposition to rove. Irresistible desire to run.
• Wild, as if moved by sudden impulses. Bewildered.
• Twitching of facial muscles.

Agaricus vernus [= Amanita verna] Agar-v. A
• Mutualistic [symbiotic].
• Fool's Angel. Destroying Angel.
• Death masquerading as a virgin bride.
• Pain-caused restlessness.
• Remission and return of symptoms.
• Rapid loss of strength and weight.
• Similarity with strychnine poisoning.

Alcoholus Alco. R - 290
• Sociability leading to self-glorification.
• Impairment of judgement; overstepping borders, crossing limits, breaking taboos.
• Social alienation.
• Self-castigation; self-reproach; punishment.
• The creeps.
• Neurological degeneration.

Aleurisma lugdunense [= Geomyces pannorum] Aleur-1. A
• Cold-loving saprophytic mould.
• Acid environments.
• Rapid growth rate; expanding.
• Variable.
• Degrades keratin; associated with superficial skin and nail infections.

Alter-a. N

Alternaria alternata
• Saprophytic mould.
• Plant pathogen producing mycotoxins.
• Requires moisture, but survives dry conditions.
• Increased spore dispersal when relative humidity drops.
• Allergies. Asthma.
• Warm, humid weather <.
• Chronic sinusitis [maxillaris].

Armi-m. N

Armillaria mellea
• Wood-decaying fungus parasitic to weakened shrubs and trees.
• Proliferous growth and expansion.
• Produces black shoestring-like strands.
• Strangles trees or strengthens orchids.
• Essental and renal hypertension.
• Hypertension-related symptoms: dizziness, vascular headache, tinnitus.
• Strengthening effect in neurasthenia.
• Illuminating.

Asperg-br. A

Aspergillus bronchialis
• Probably not a separate species but a strain of Aspergillus fumigatus.

Asperg-c. A

Aspergillus candidus
• Saprophytic fungus preferring warm soils and stored grain.
• Used in the production of miso, soy sauce and sake.
• Inhibits the production of the pigment melanin. Used in skin lightening cosmetics.
• Copper.

Asperg-fl. A

Aspergillus flavus
• Yellow to olive green saprophytic mould.
• Lipophilic; associated with fats and oils [nuts, peanuts and tree seeds].
• Warm, humid climates. High relative humidity.
• Soy sauce.
• Aflatoxins.

Asperg-fti. A

Aspergillus fumigatus
• Bluish-green to grey saprophytic mould.
• Thrives in humid conditions.
• Tolerates very high temperatures.
• CNS disease related to hot weather.
• Birds.
• Allergies; predilection for the nose and sinuses.
• Aspergillosis.

Asperg-n. A

Aspergillus niger
• Jet black saprophytic mould.
• Musty odour.
• Citric acid; soft drinks.
• Reacts with arsenicals.
• Copper; detects copper.
• Ear infections and nasal sinus infections.
• Skin reactions; swelling of the face.

Aureobasidium pullulans Aureo-p. N

- Black yeast-like mould.
- Saprophytic with pathogenic potential.
- Requires wet conditions.
- Sensitive to heat.
- Produces pullulan, used for the manufacturing of oxygen-impermeable films and adhesives.
- Allergenic [hay fever and asthma].
- Dermatitis. Subcutaneous cysts.

Auricularia polytricha Auric-p. N

- Ear-shaped saprophytic fungus growing on wood.
- Turns purple with age.
- Hard or soft and flabby.
- Inflexible when dry, flexible when moist.
- Strengthens the will. Contains iron.
- Haemorrhages. Circulation.

Blastomyces dermatitidis Blast-d. N

- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Moist environments.
- Dogs.
- Causative agent of blastomycosis.
- Predilection for the lungs and the skin and subcutaneous tissue.
- Abscesses; fistulae.

Boletus edulis Bol-ed. A

- Mutualistic [symbiotic].
- Delicate pinkish network of fine lines on upper part of stalk.
- Alternately abundant and rare.
- Puzzling variableness.

• The King - “the one aristocrat the peasantry can eat.”
• Little pig - the King reduced to vulgarity.
• Eases the tendons.
• Gastrointestinal upsets.

Bol-lu. R-7

Boletus luridus
• Mutualistic [symbiotic].
• Fire Fungus. Conspicuous blood-red network on stalk.
• Turns blue-black when cut or bruised.
• Alcohol <.
• Intense thirst.
• Angioneurotic oedema.

Bol-s. R - 19

Boletus satanas
• Mutualistic [symbiotic].
• Fine red network on stalk.
• Turns blue when cut or bruised.
• Decomposes soon after reaching maturity into a putrescent mass.
• Offensive odour, carrion-like or like rotting onions.
• Severe gastrointestinal irritation.
• Great prostration [from loss of fluids].

Botr-c. N

Botrytis cinerea
• Grey mould; saprophytic but may turn parasitic.
• Common contaminant of [over-mature] fruits [esp. strawberries] and vegetables.
• Invades plant tissues damaged by frost, punctures or fertilizer-burns.
• Causes abortion of flowers and reduced seed yields.
• Reacts strongly to slight changes in atmospheric humidity.
• Darkness or red light <; blue light >.
• Noble rot; special wines.
• Allergies [hay fever; asthma].
• Oxalic acid.

Bov. R-3322

Bovista [= Calvatia gigantea]
• Saprophytic.
• Attached to soil by cord-like mycelial strand.
• Breakfast mushroom. [Repertory: After breakfast >].
• Styptic; haemorrhages.
• Foretelling the future.
• Bone dry; rich in aluminium.
• Puffiness; enlargement; distension.
• Emptiness; deflation; gone with the wind.
• Rupturing when agitated.
• Dark clouds of spores, like smoke or fog.
• Double skinned.

Candida albicans — Moni. R - 469
• Rapidly growing dimorphic fungus, changing from yeast-like to filamentous.
• Part of the normal flora in the throat, vulvovaginal area, lower intestinal tract, and skin.
• Feeds on sugars and other simple carbohydrates.
• Causative agent of candidiasis.
• Brain fog. Spaciness.
• Mood swings.
• Anger and aggression.
• Sugar craving. Hypoglycaemia.
• Digestive problems.

Cand. R - 8

Candida parapsilosis
• Spider-like with satellite fingers extending outward.
• Abuse of azole antifungal agents.
• Scatter-brained. Spaciness.
• Explosive anger.
• Craving for salt.
• Burning pains/sensations.
• Itching.

Cantha-c. A

Cantharellus cibarius
• Mutualistic [symbiotic].
• Turns brown when pressed.
• “It never did any one harm, but might even restore the dead.”
• High water content. Sponge-like.
• Queen seductress.
• Night blindness.
• Frost, freezing <.
• Air pollution <.

Cerevisia lager [= Saccharomyces carlsbergensis] Cerev-lg. R - 2
• Yeast. Bottom-fermenting yeast.
• Lager beer.
• Reproduction rate is greater than that of Saccharomyces cerevisae at lower temperatures.
• Burning flame-like sensation.

Cetr. R - 17

Cetraria islandica
• Fruticose lichen.
• Cold climates.
• Brittle when dry, tough when slightly moist; soaks up water like a sponge.
• Pulmonary troubles and digestive disturbances.

Chloro-m. N

Chlorophyllum molybdites
• Saprophytic fairy ring fungus.
• Green.
• Fond of warm weather.
• Severe gastrointestinal symptoms.
• Forceful, persistent, explosive. Rapid dehydration.
• Difficulty standing, swallowing or talking from weakness.

Cladonia pyxidata Clad. R-3
• Fruticose-squamulose lichen.
• Acidic soils in open and semi-open habitats.
• Hurried and busy.
• Dryness.
• Open air >.

Cladon-ra. A

Cladonia rangiferina
• Fruticose lichen.
• Cool, moist climates.
• Fragile, brittle and small.
• Fragmentation; scattered and disorganized.
• Used, duped or trapped.
• Dirt; cleaning and organizing.
• Afternoon sleepiness.

Clados-m.

Cladosporium metanigrum [= Hortaea werneckii]
- Dimorphic ftingus: a yeast when young, a mould when mature.
- Commensal on normal skin [feeds on decomposed lipids].
- Halophilic [salt-loving].
- Converts tyrosine to melanin.
- Causative agent of skin infections, esp. in people with hyperhidrosis.
- Tinea nigra, typically occurring in coastal areas.
- Higher incidence in females.

A

Coccidioides immites
- Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
- Dry, saline soils. Desert areas.
- Highly resistant to heat, dryness, and salinity.
- Becomes airborne in dust storms.
- Desert rheumatism: combination of arthritis, conjunctivitis, and erythema
- Causative agent of coccidioidomycosis.
- Higher incidence in males and among dark-skinned people.
- Predilection for the lungs, musculoskeletal system, and the skin.
- Defining disease for AIDS.

Cocci-im.

N nodosum.

Copr-a. N

Coprinus atramentarius
- Saprophytic.
- Pioneer in disturbed ground.
- Autolysis [self-digestion], puts on a disappearance act.
- Self-destruction for the purpose of reproduction.
- Very fragile and short-lived, yet pushy and pressing ahead.
- Pops up massively; seizes control; overruns others; monopolises.
- The soldier among mushrooms. Attila the Hun.
- Intolerance of alcohol. Tippler's Bane.
- Swelling, subjectively and objectively.
- Molybdenum and zinc.

Cordyceps militaris Cordyc. R - 18
• Parasite on larvae and pupae of moths.
• Bright crimson or orange-red.
• Groups “look like a regiment of toy soldiers.”

Cordyc-s. N
Cordyceps sinensis
• Parasite on larvae of a bat moth.
• Found only in high and cold mountainous regions.
• Altitude sickness.
• Record-breaking performance.
• Affinity with respiratory system.
• Enhances endurance.

Cort-o. N
Cortinarius orellanus
• Mutualistic [symbiotic].
• Radish-like smell and taste.
• Prefers northern latitudes and autumnal months.
• Kidneys. Renal failure.
• Intense, burning thirst.
• Sensation of coldness.
• Aluminium.

Crypt-n. R - 1
Cryptococcus neoformans
• Yeast, but does not ferment sugars.
• Heavily encapsulated.
• Turns brown with age due to melanin production.
• Pigeons. Pigeon breeders.
• Predilection for CNS and brain. Meningitis.
• Inappropriate speech or dress.
• Defining disease for AIDS.

Cyclosporinum Cyclosp. R - 49
• Substance produced by Tolypocladium niveum, the anamorph of Cordyceps subsessilis.
• Cordyceps subsessilis parasitises on scarab beetle larvae.
• Alien invader.
• Metamorphosis: Winter Worm, Summer Plant.
• Organ transplantation.
• Immunosuppressant.
• Renal impairment and hypertension.
• Nocturnal aggravation; unrefreshed in morning.
• Pains burning/stitching.
• Right side.

Ergot. R - 25
Ergotinum
• Total extract of dried Claviceps purpurea.
• May be considered when Secale fails to work.
• Congestive headaches of phlegmatic, lymphatic women during climaxis.
• Faintness.
• Slowing-down of mental processes.
Fusarium graminearum Fus-gr. N
• Pathogenic/ parasitic or saprophytic mould.
• Requires wet and cool weather.
• Release of spores typically during rainy or foggy weather.
• Growth stimulant; too rapid growth.
• Conversion of female into male.
• Oestrogenic syndrome.

Fus. A

Fusarium oxysporum
- Pathogenic/ parasitic or saprophytic mould.
- Causes wilt in crop plants [loss of turgidity and collapse of leaves].
- Requires very wet conditions.
- Release of spores typically during rainy or foggy weather.
- Requires calcium.
- Bio-bombing.
- Coloniser of burned skin.
- Predilection for blood vessels and skin.

Fus-sp. N

Fusarium sporotrichioides
- Pathogenic/ parasitic or saprophytic mould.
- Contaminates cereals.
- Favours wet and cool weather.
- Produces toxins that are heat- and ultraviolet light-stable.
- Haemorrhages.
- Neurotoxicity.
- Radiation poisoning. Chemotherapy.

Gano-1. N

Ganoderma lucidum [Reishi]
- Saprophytic.
- Appearance well-preserved, lustrous, varnished, lacquered.
- Extremely bitter.
- Grows at the base of trees or trunks in densely wooded mountain areas of dim lighting.
- Deathlessness. Immortality.
- Flourishes when there is peace and good rule.
- Associated with raven-like birds [ravens fetched light into the world].
- Transformation.
- Disorders related to ageing, degeneration, and stress.
- Germanium.

Grif-f. N

Grifola frondosa
- Bracket fungus appearing in dense, overlapping fronds.
- Saprophytic or parasitic; annual.
- Sensitive to environmental changes.
- Blood sugar levels. Diabetes.
- Obesity.
- Cancer regression; immunostimulation.

Gymnopilus spectabilis — Gymn-s.
• Saprophytic.
• Turns green on cooking.
• Shades of yellow; yellow vision.
• Unstoppable, uncontrollable laughing.
• Dancing and singing.

Gyromitra esculenta — Gyro-e.
• Saprophytic.
• Grotesque shape. Stalked brain. Brain Mushroom.
• Small clouds of spores during spells of dry, warm weather.
• Likes the cold. [Warmer temperatures seem to reduce its toxicity.]
• Volatile. Rocket fuel.
• Severe gastrointestinal symptoms.
• Unquenchable thirst.
• Night <.
• Resembles Phosphorus.

Histoplasma capsulatum — Histo-c.
• Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
• Slow growth rate.
• Causative agent of histoplasmosis.
• Defining disease for AIDS.
• Histoplasmosis may coexist with sarcoidosis or tuberculosis.
• Endemic in eastern and central North America.
• Chickens, starlings, and bats.

Hortaea werneckii *[see* Cladosporium metanigrum]

Hyderginum — Hyderg.
• Semisynthetic derivative of three ergotoxine alkaloids.
• Cognitive impairment.
• Amnesia.
• Dementia-like state.
• Hostile, uncooperative and unsociable.
• Languid and drained.

Inonotus obliquus — Inon-o.
• Parasitic-saprophytic canker conk.
• Black masses, as if charred or burned.
• Gastointestinal disorders, including cancer.
• Combination of skin eruptions and gastrointestinal problems.
• Beginning and end.

Kluyveromyces marxianus — Kluyv-ma.
• Yeast.
• Dairy products.
• Produces lactase. Lactose intolerance.
• Kefir.

Lentinula edodes [Shiitake] Lent-e.
N
• Saprophytic.
• Tough, pliant, as old leather.
• Prefers forest shade where cold water is nearby.
• Growth stimulated by vibration.
• Manganese and zinc.
• Neutralises environmentally persistent pesticide contaminants such as chlorophenols and dioxins.
• Lowers level of total cholesterol.
• Shiitake dermatitis [flagellate skin lesions], resembling effects of self-flagellation.
• Dermatitis < sunlight.

LSD. R -?
LSD
• Synthetic derivative of the ergot alkaloid lysergic acid.
• Flashbacks and release [reliving] of repressed traumatic experiences.
• Transformation and disintegration of accustomed world view.
• Daily reality in a new light.
• Sense of mystical experience. Focus on the transcendental and divine.
• Visual illusions or visionary perceptions.
• Enhanced colour perception.
• Alteration of body image.
• Childlike feeling.

Methys. R - 21
Methysergidum
• Synthetic ergot alkaloid.
• Medically used as a prophylactic in migraine and other vascular headaches.
• Alcohol, smoking, and coldness <.
• Hungry feeling related to emotions.
• Weight gain.
• Water retention.
• Fibrosis.
• Akathisia.

Morch-es. N
Morchella esculenta
• Saprophytic.
• Favours burnt places.
• More abundant in regions with cold winters.
• Slow development.
• Preoccupation with secrecy.
• Glorious morel madness.
• Gastrointestinal disorders.

Mucor. R - 27
Mucor mucedo
• Saprophytic mould.
• Colonizes moist places but is also very drought tolerant.
• Rapid growth.
• Carbohydrates.
• Overgrows and inhibits other fungi; doesn't like competition.
• Intricate courtship.
• Allergenic reactions. Dermatitis.
• Propensity to affect acidotic patients.
• Spring and autumn <.

Muscin. R - 7
Muscarinum
• Profuse perspiration, salivation and lachrymation.
• Vomiting, increased urination and increased defecation.
• Combination of effects of pilocarpine, nicotine and curare.
• Defective accommodation.

Nectrianinum Nectrin.R - 2
• Saprophytic-pathogenic fungus causing tree [beech] canker.
• Causes serious volume losses.
• Red and orange.
• Increases body temperature.
• Crisis terminating in polyuria and profound sleep.

Neotyphodium lolii [under Lol.] R - 131
• Endophyte [lives *within* the host].
• Symbiotic [enhancing host fitness and receiving protection in return] or parasitic [permitting almost no host seed production].
• Infects grasses, predominantly Lolium species.
• Tremors, moves, shakes, and staggers.
• Rock and Roll fungus. “Let’s shake, rattle, and roll.”
• Movement, excitement, noise or disturbance <.
• Reproductive and cardiovascular problems.

Omphalotus illudens Omph-i. N
• Saprophytic fungus causing white rot.
• Shades of orange.
• Glows ghostly greenish in the dark.
• Favours warmer regions.
• Emphasis on gastrointestinal disturbances, notably nausea and vomiting.
• Concomitants: exhaustion and sense of being cold.
• Contains cytotoxic compounds with tumour-shrinking properties.

Paracoccidoides brasiliensis Parac-br. N
• Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
• Slow growth rate.
• Humid soils rich in proteins.
• Causative agent of paracoccidioidomycosis.
• Predilection for reticuloendothelial system, skin and mucous membranes.
• Higher incidence in males.

Paxillus involutus Pax-i. N
• Mutualistic [symbiotic].
• Acid soil.
• Sour smell.

• Sour taste in mouth.
• Haemolytic anaemia.
• Kidney failure.

Penic-cm. A

Penicillium camemberti
• Saprophytic mould.
• Camembert and Brie.

Penic-chr. N

Penicillium chrysogenum
• Grass green to bluish green saprophytic mould.
• Commonly found in house dust.
• Potent contact sensitizer.
• Tremors.
• Toxic antibiotic.

Penic-cy. A

Penicillium cyclopium
• Saprophytic mould producing an orange pigment.
• Occurs on cereals and mouldy meat products.
• Nephropathy.

Penic-e. A

Penicillium expansum
• Grey-green saprophytic mould.
• Spoilage of stored fruits.
• Invades damp places; indicator organism for dampness indoors.
• Inhabits refrigerators.
• Pains < damp stormy weather, > dry sunny weather.
• Similar to Rhus toxicodendron.

Penic-g. A

Penicillium griseum
• Identical with P. aurantiogriseum or P. griseofulvum [?].
• Saprophytic mould.
• Griseofulvin [antifungal drug].

Penic-n. A

Penicillium notatum
• Saprophytic mould occurring on foodstuff and animal feed.
• Closely allied to P. chrysogenum or identical with it.

Penic-p. A

Penicillium piceum
• Yellow saprophytic mould.
• Skin irritation and sensitization.

Penic-r. N

Penicillium roqueforti
• Dark green to dark blue-green saprophytic mould.
• Fast growing.
• Grows under conditions of high carbon dioxide and low oxygen concentrations.
• Blue-veined cheeses.
• Allergic reactions similar to those evoked by shellfish.
• Tremors.

Penic. R - 72

Penicillinum
• Benzylpenicillin Sodium.
• Allergic hypersensitivity reactions.
• Dermatologic symptoms.
• Feeling of icy coldness.
• Abuse of penicillin.

Phal. R - 14

Phallus impudicus
• Saprophytic
• Unstoppable speed.
• Uncontrollable force.
• Compelling stench. “Lavatorial smell that attracts flies.”
• Sulphur.
• Shameless shape.
• Shapeless flaccidity.
• Orgasm mushroom.

Phell-n.

Phellinus nigricans
• Black.
• Saprophytic or wound parasite.
• Destructive tendencies.
• Immunostimulating properties.

A

Pipt-b. N

Piptoporus betulinus
• Annual bracket fungus growing exclusively on dead or dying birch trees.
• Fast development.
• Sour smell and taste.
• Smoulders slowly but persistently when used as tinder [similar to charcoal].
• Deathbed. Reviver.
• Anthelmintic. Bowel problems.
• Tumours.
• Encompasses the symbolism of the birch.

Pityr-o.

Pityrosporum orbiculare
• Lipophilic [fat-loving] yeast.
• Part of normal human skin flora; highest numbers present on chest and back.
• Overgrowth results in pityriasis versicolor.
• Common around puberty.
• High temperatures, humidity, and heavy sweating <.
• Seborrhoea and dandruff.

A

Pleur-o. N

Pleurotus ostreatus
• Saprophytic white rot fungus growing on dead standing trees or fallen logs.
• Favours cool weather; may fruit in winter during thaw.
• Carnivorous; anthelmintic.
• Cholesterol; chronic use of alcohol.
• Building blood cells or destructive to blood cells.
• Muscle inflammation, pains or cramps.
•Warts.

Polyporus officinalis [= Fomitopsis officinalis] Bol-la. R - 190
• Saprophytic or wound invader.
• Grows on the middle and upper portions of trunks and trees.
• Extremely bitter.
• Used as a vulnerary.
• Great prostration.
• Restlessness at night.
• Marked chilliness.
• Gastrointestinal disorders.

Polyporus pinicola [= Fomitopsis pinicola] Polyp-p. R - 73
• Saprophytic or wound invader.
• Pioneer invader.
• Grows at the base of trees or trunks.
• Tonic properties.
• Narcotic properties; gives a real 'kick'.
• Styptic.
• Joint problems.

Psilocybe caerulescens Psil. R-554
• Saprophytic.
• Landslide mushroom.
• Grows in clumps, 'families'.

Psilocybe caerulescens
• Altered time and space sense.
• Alteration of body image.
• Omnipresent and omnipotent.
• Red and green colours.
• Crossing of the senses.
• Sense of impending doom.
• Increased body temperature.

Psilocybe semilanceata Psil-s. A
• Saprophytic.
• God and Devil; conflicting parts of the psyche.
• World unfolding between the extremes of frightening and enlightening.
• Dysphoria - euphoria.
• Altered time and space sense.
• Nature awareness; tree hugging.
• Immoderate laughing; indifferent to reprimands.
• Coldness and numbness.

Pycnoporus sanguineus Pycnop-sa. R - 272
• Saprophytic wood decay fungus.
• Shades of bright orange and red.
• Relatively rich in natrium and ferrum.
• Sore, ulcers, thrush; eczema.
• Rheumatic disorders.
• Sharp pains.
• Easily annoyed. Disorder annoys. Annoying itchiness.

Rhiz. A

Rhizopus niger [= Rhizopus nigricans]
• Black bread mould.
• Thrives in damp places.
• Fast growth; tendency to overgrow and inhibit other fungi.
• Transforms sterols.
• Manganese.
• Allergen [hay fever and hay asthma].

Ringw. R- ?

Ringworm
• Miasm between Psora and Sycosis.
• Periods of hope - trying to do something - alternating with periods of giving up.
• Consolation <.
• Aversion to coffee.

Russ. R - 14

Russula foetens
• Saprophytic.
• Heavy empyreumatic odour.
• White flesh turns brown on exposure to air.
• Odour absent in very dry weather.
• Choleraic symptoms.
• Coldness and cyanosis.
• Attack followed by painful furuncles.

Sacmy-a. A

Saccharomyces apiculata [= Kloeckera apiculata]
• Yeast. Wild yeast.
• Fermentation starter.
• Dies at ethanol levels of 4% to 5%.
• Fruity flavour.
• Destroyed by sulphur dioxide.
• Can break down proteins.

Saccharomyces carlsbergensis *[see* Cerevisia lager]

Saccharomyces cerevisiae *[see* Torula cerevisiae]

Sclero-c.N

Scleroderma citrinus
• Thick, leathery, single-layered skin with large, scaly warts.
• Mutualistic [symbiotic].
• Deep sleep followed by restlessness.
• Tingling / numbness, descending.
• Stiffness.

Secale cornutum [= Claviceps purpurea] Sec. R-3231
• Parasitic on grasses, mainly rye.
• Replaces ovaria of host.
• Requires coldness in order to germinate.
• Copper deficiency.
• Holy or hellish visionary / convulsionary.
• Cardiovascular and/or neurological effects.
• Demeter.
• Bastard.
• Perils of procreation.

Sporobolomyces roseus Sporob-r.
• Rose-coloured yeast. A
• Mirror yeast.
• Bad-weather fungus.
• Releases large amounts of spores in late summer and during sultry nights.
• Allergen.

Sporobolomyces salmonicolor Sporob-s.
• Salmon-coloured yeast. A
• Mirror yeast.
• Allergen.

Sporothrix schenckii Sporot. A
• Dimorphic fungus - either a saprophytic mould or a yeast-like pathogen.
• Causative agent of sporotrichosis, a generally indolent infection more rently occurring in freqi males.
• Wound invader through puncture wounds.
• Rose growers disease.
• Chancre-like skin lesions with nodular lymphangitis.
• Systemic form involves the bones and joints, the lungs, and the meninges.
• Syphilitic miasm.
• Warm compresses >.

Stachybotrys chartarum Stachy-c.
• Black mould. N
• High moisture requirement; low nitrogen requirement.
• Cellulose.
• Haemorrhages.
• Irritation of mucous membranes and skin.

Sticta [= Lobaria pulmonaria] Stict. R - 531
• Foliose lichen.
• Prefers areas of strong coastal influences or areas along streams.
• Dryness.
• Flowing; water.
• Flying; floating.
• Housemaid’s knee; domestic slave.

Torula cerevisiae [= Saccharomyces cerevisiae] Tor. R -8
• Brewers or Bakers yeast.
• Rich in B vitamins and minerals.
• One of the oldest domesticated organisms.
• Workaholic.
• Regeneration versus conservation of tradition.
• Effervescence versus daily bread.
• Digestive problems. Food allergies.
• Boils, carbuncles, suppuration.

Trametes versicolor Tram-v.
N
• Prolific, saprophytic wood decay fungus.
• Rainbow colours in exposed situations; more uniformly coloured in sheltered situations.
• Favours damp, shady places.
• Zonates its territory within the wood.
• Ringworm.
• Tumours.
• Darkening of the fingernails.

Tremella fuciformis Trem-f. N
• Gelatinous, dimorphic fungus parasitizing on or associating with other fungi.
• Prefers damp areas; shrinks when dry, swells up when wet.
• Snow White or wolf in sheeps clothing.
• Bronchial and asthmatic problems.
• Hypoglycemia.
• Radiation injury from radio- and chemotherapy.

Trichophyton genus
• Keratinophilic filamentous moulds.
• Dermatophytes on man and animals.
• Rare example of fungi that are highly contagious.
• Confined to outer skin layers; rarely invade living tissues.
• Causative agents of tinea [ringworm].
• Exclusion from social contacts.
• Tuberculinic miasm.

Trichophyton depressum [= T. mentagrophytes] Trichoph-d.
A
• Anthropophilic and zoophilic.
• Cats, and to a lesser degree dogs, may be for people a source of infection with this organism.
• Moderate growth rate.
• Tinea capitis, corporis, cruris, barbae, pedis.
• Perforates hair.
• Abscesses accompanied by regional glandular swellings and fever.

Trichophyton persearum [= T. persicolor] Trichoph-p. A
• Zoophilic.
• Invades skin, not hair.
• Rapid growth rate.

Trichophyton rubrum Trichoph-r. A
• Anthropophilic.
• Slow to moderately rapid growth rate.
• Tinea corporis, cruris, pedis, unguim.

Trichoph-t. A

Trichophyton tonsurans
• Anthropophilic.
• Tinea capitis, corporis, unguim.
• Perforates hair.
• Slow growth rate.
• Growth enhanced by vitamin B1 [thiamine].
• Produces urease.
• Abscesses accompanied by regional glandular swellings and fever.

Tuber-m. N

Tuber melanosporum
• Symbiotic.
• Adapted to underground lifestyle; no dependency on light.
• Favours low temperatures.
• Distinctive odour and flavour.
• Benefits from shock treatment.
• Daughters of change.
• Male-type pheromones.
• Concealed deceit or hidden divine revelation.

Usn. R - 22

Usnea barbata
• Fruticose lichen.
• Bacteriostatic.
• Protects against UV light.
• Sunstroke; sun c.

Ust. R-650

Ustilago maydis
• Dimorphic fungus: yeast state and filamentous state.

• Invades young host tissue, causing hypertrophy and uncontrolled cell division [hyperplasia].
• Forms large, tumourlike, black galls.
• Incidence higher in soils high in nitrogen.
• Mutation common.
• Styptic.
• Burning. Bursting.
• Predilection for skin, circulation, and sexual organs.

TABLE OF FUNGI AND THEIR ASSOCIATED METALS AND MINERALS

The following fungi are associated in some way or other with the minerals below.

In alphabetical order according to mineral.

Aluminium	
Bovista nigrescens [shares 1,000 rubrics with Alumina]	Bov.
Cortinarius orellanus	Cort -o.
Calcium	
Ganoderma lucidum	Gano-1.
Tuber melanosporum [Likes calcium and carbon-rich soil]	
Fusarium oxysporum [Requires calcium]	Fus-o.
Rhizopus nigricans [Requires calcium]	
Aspergillus niger [Requires calcium]	Asperg-n.
Chromium	
Saccharomyces cerevisiae	Tor.
Copper	
Ganoderma lucidum	Gano-1.
Claviceps purpurea [Copper deficiency]	Sec.
Aspergillus candidus	Asperg-c.
Aspergillus niger var. niger Tieghem [Detects copper]	Asperg-n.
Aspergillus niger	Asperg-n.
Saccharomyces cerevisiae	Tor.
Ferrum	
Ganoderma lucidum	Gano-1.
Saccharomyces cerevisiae	Tor.
Auricularia polytricha	Auric-p
[Gyromitra esculenta [Excess iron in liver]	Gyro-e.
Gallium	
Aspergillus niger	Asperg-n.
Germanium	
Ganoderma lucidum [Reishi]	Gano-1.
Saccharomyces cerevisiae	Tor.
Magnesium	
Ganoderma lucidum	Gano-1.

PATHOLOGY AND FUNGI

Abbreviation	Homeopathic Name	Pathology
MACROSCOPIC FLESHY FUNGI (24)		
Agar-bi.	Agaricus bisporus	Allergic
Agar-cit.	Agaricus citrinus	Cholera; lethargy
Agar-cpn.	Agaricus campanulatus	CNS; hilarity; motion
Agar-cps.	Agaricus campestris	Gastrointestinal
Agar-em.	Agaricus emeticus	Cholera; gastrointestinal
Agar-pa.	Agaricus pantherinus	CNS; ataxia; fearless
Agar-ph.	Agaricus phalloides	GI cramps; chill; thirst
Agar-pr.	Agaricus procerus	
Agar-[illegible]	Agaricus rubescens	Anaemia; sensory functions
[illegible]	Agaricus semiglobatus	Inco-ordination; space/time
Agar-st.	Agaricus stercorarius	Disoriented. Impulsive.
Agar-v.	Agaricus vernus	As strychnine poisoning
Agar.	Agaricus [muscarius]	Sensory functions; delusions
Bol-ed.	Boletus edulis	Gastointestinal; tendons
Bol-lu.	Boletus luridus	Angioneurotic oedema; thirst
Bol-s.	Boletus satanus	Gastointestinal; prostration
Bov.	Bovista lycoperdon	Styptic; haemorrhages
Cantha-c.	Cantharellus cibarius	Night blindness
Copr-a.	Coprinus atramentarius	
Muscin.	Muscarinum	Profuse loss fluids; focussing <
Phal.	Phallus impudicus	
Psil-s.	Psilocybe semilanceata	Space/ time; dysphoria/euphoria
Psil.	Psilocybe caerulescens	Space/ time; heat
Russ.	Russula foetens	Cholera; cold; cyanosis
MOLDS (20)		
Asperg-br.	Aspergillus bronchialis	CNS < hot; allergies;
Asperg-fl.	Aspergillus flavus	Aflatoxins
Asperg-fu.	Aspergillus fumigatus	CNS < hot; allergies;
Asperg-n.	Aspergillus niger	Ear & nasal infections; skin.
Mucor	Mucor mucedo	Allergic reactions; dermatitis
PARASITIC/ENDOPHYTIC FUNGI (10)		
Cordyc.	Cordyceps militaris	
Cyclosp.	Cyclosporinum	Renal; burn/stitch pain; HBP;
Fus.	Fusarium oxysporum	Colonizes burnt skin; blood vessels
Lol.	Lolium temulentum	Tremors; Cardio & Repro diffs.
Sec.	Secale cornutum	Tremors; womb; abortion
Ergot. [Sec.]	Ergotinum	Faint; congestive headaches
Hyderg. [Sec.]	Hyderginum	Amnesia; dementia; hostile
LSD. [Sec.]	Lysergic acid diethylamide	Flashbacks; delusions;
Methys.[Sec.]	Methysergidum	Migraine; Fibrosis; Akathisia
Ust.	Ustilago maydis	Skin; circulation; styptic
WOOD-INHABITING FUNGI (6)		
Agar-ac.	Agaric acid - Agaricin	Debilitating night sweats
Bol-la.	Boletus laricus	
Nectrin.	Nectrianinum	Crisis - polyuria - deep sleep
Phell-n.	Phellinus nigricans	Destructive/ Immunostimulant
Polyp-p.	Polyporus pinicola	Vulnerary; chill; GI; Restless
Pycnp-sa.	Pycnoporus sanguineus	Ulcers; Thrush; Eczema; Rheumatic

Element	Fungus	Abbreviation
Manganese	Ganoderma lucidum	Gano-1
	Trametes versicolor	Tram-v.
Molybdenum	Aspergillus niger	Asperg-n.
Selenium	Amanita muscaria	
	Boletus edulis	Bol-ed.
	Grifola frondosa	Grif-f.
	Saccharomyces cerevisiae	Tor.
Stannum	Grifola frondosa	Grif-f.
Vanadium	Amanita muscaria	
Zinc	Fusarium oxydatum	Fus-o.
	Aspergillus niger	Asperg-n.
	Grifola frondosa	Grif-f.
	Ganoderma lucidum	Gano-1.

"Whether calcium is essential for all fungi is still a controversial question. Young and Bennett [1922] concluded that calcium is generally beneficial in the growth of most fungi and is certainly required by Fusarium oxysporum, Rhizopus nigricans, and Aspergillus niger. ... Zinc is the element of first choice in studies dealing with the mineral nutrition of fungi. ... Zinc does not uniformly influence conidial production in the same manner in all fungi. Roberg and Porges found that zinc inhibits sporulation of A. niger. Zinc represses sporulation of Trichoderma koningii but stimulates conidial production by Fusarium oxydatum. ... Although mycelial growth is dependent primarily on zinc and to a lesser degree on iron and copper, it is essential that each of these heavy metals be present to produce normal colours in a particular fungus. The profound effect which zinc exercises on the growth and sporulation of fungi is an index of the influence which this element exerts on digestive and respiratory activities." [Wolf & Wolf]

Penic-cm.	Penicillium camemberti	
Penic-cy.	Penicillium cyclopodium	Nephropathy
Penic-e.	Penicillium expansum	Similarto Rhus tox
Penic-g.	Penicillium griseum	
Penic-n.	Penicillium notatum	
Penic-p.	Penicillium piceum	Skin irritant; sensitiser
Penic-r.	Penicillium roqueforti	Allergic; tremors
Penic.	Penicillinum	Allergic hypersensitivity; cold
Rhiz.	Rhizopus niger	Allergic hay fever/ asthma
Ster-c. [Asperg-c].	Sterigmatocystis candidum	Skin lightening cosmetics
Trichoph-d.	Trichophyton depressum	Tinea capitis; abscess; fever
Trichoph-p.	Trichophyton persearum	Invades skin
Trichoph-r.	Trichophyton rubrum	Invades skin
Trych-t.	Trychophyton tonsurans	Invades hair; abscess; swellings
Ringw. [Trich.]	Ringworm nosode	
Alco.	Alcoholus	Nerve degeneration. Asocial
Cand.	Candida parapsilosis	Burn/itch; anger; crave salt
Cerev-lg.	Cerevisia lager	Burning like flames
Kluyv-ma.	Kluyveromyces marxianus	Lactose intolerance
Moni.	Monilia albicans	Hypoglycaemia; Anger; GI; moods
Pityr-o.	Pityrosporum orbiculare	Greasy skin; dandruff;
Sacmy-a.	Saccharomyces apiculata	
Sporob-r.	Sporobolomyces roseus	Allergen
Sporob-s.	Sporobolomyces salmonicolor	Allergen
Tor.	Torula cerevisiae	Allergies, boils, digestion, pus

YEASTS (10)

DIMORPHIC FUNGI (3)

Clados-m.	Cladosporium metanigrum	Tinea in sweaty people/women
Cryptc.	Cryptococcinum	CNS, brain; meningitis;
Sporot.	Sporothrix schenckii	Chancre; Lymphangitis; bones

LICHENS (5)

Cetr.	Cetraria islandica	Pulmonary; digestive
Cladon-r.	Cladonia rangiferina	Scattered, used, sleepy pm.
Cladon.	Cladonia pyxidata	Open air >
Stict.	Sticta pulmonaria	Lungs; bursitis in knees
Usn.	Usnea barbata	Sunstroke.

TREES	REMED	HOM. NAME	LATIN NAME	FAMILY
Birch [Betula]	Agar.	Agaricus [muscarius]	Amanita muscaaria	Amanitaceae
Oak[Quercus]	Agar-ph.	Agaricus phalloides	Amanita phalloides	Amanitaceae
Deciduous woodland	Agar-r.	Agaricus rubescens	Amanita rubescens	Amanitaceae
Deciduous woodland	Armi-m.	Armillaria mellea	Armillaria mellea	Tricholomatace
Deciduous woodland	Auric-p.	A. polytrichia	Auricularia auricula-judae	Auriculariaceae
Conifers	Bol-ed	Boletus edulis	Boletus edulis	Polypo raceae
Deciduous woodland	Bol-ed.	Boletus edulis	Boletus edulis	Boletaceae

MIASMS AND FUNGI

The table shows the distribution of the Fungi remedies into their possible miasmatic dispositions.

Conifers	Bol-la.	Boletus laricis	Fomitopsis officinalis	Polyporaceae
Larch [Larix]	Bol-la.	Boletus laricus	Fomitopsis officinalis	Polyporaceae
Beech [Fagus sylvatica]	Bol-s	Boletus satanus	Boletus satanus	Boletaceae
Birch [Betula]	Cantha-c	C. cibarijus	Cantharellus cibarius	Cantharellaceae
Conifers	Cantha-c	C. cibarius	Cantharellus cibarius	Cantharellaceae
Sweet Chestnut [Castanea sativa] Oak [Quercus]	Cantha-c	C. cibariius	Cantharellus cibarius	Cantharellaceae
Deciduous woodland	Gano-1.	Ganoderma lucidum	Ganoderma lucidum	Ganodermataceae
Beech [Fagus sylvatica]	Grif-f	Grifola frondosa	Grifola frondosa	Polyporaceae
Deciduous woodland	Nectrin.	Nectrianinum	Nectria ditissima	Nectriaceae
Elm [Ulmus]	Phell-n.	Phellinus nigricans	Phellinus nigricans	Hymenochaetaceae
Deciduous woodland	Pleur-o	Pleurotus ostreatus	Pleurotus ostreatus	Tricholomataceae
Deciduous woodland	Polyp-p.	Polyporus pinicola	Fomitopsis pinicola	Polyporaceae
Deciduous woodland	Pycnp-	Pycnoporus	Pycnoporus	Polyporaceae
Deciduous woodland	Tram-v	Trametes versicolor	Polyporous versicolor	Polyporaceae
Deciduous woodland	Tram-v.	Polyporous versicolor	Trametes versicolor	Polyporaceae
Deciduous woodland		Lycoperdon	Lycoperdon pyriforme	Lycoperdaceae
Deciduous woodland		Summer truffle	Tuber aestivum	Tuberaceae

PSORIC	SYCOTIC	SYPHILITI	TUBERCULAR	
Alternaria	Candida	Blastomyces	Agaricus	Armillaria
Aspergillus	Cordyceps	Cryptococcus	Amanita	Auricularia
Aureobasidium	Fusarium	Histoplasma	Boletus	Ganoderma
Botrytis	Kloeckera	Hortaea	Bovista	Grifola
Microsporum	Kluyveromyces	Paracoccidioide	Cantharellus	Inonotus
Mucor	Lolium	Sporothrix	Chlorophyllum	Lentinula
Penicillium	Pityrosporum	Tremella	Coprinus	Nectria
Rhizopus	Saccharomyces		Cortinarius	Omphalotus
Trichophyton	Sporobolomyces		Gymnopilus	Piptoporus
	Stachybotrys		Gyromitra	Pleurotus
	Ustilago		Morchella	Polyporus
			Paxillus	Pycnoporus
			Psilocybe	Trametes
			Russula	
			Scleroderma	
			Stropharia	

SIMILARITIES BETWEEN INSECTS AND FUNGI

Jenni Tree

Chitin: creates the strong exoskeleton of insect wing cases and bodies, and is used instead of cellulose in fungal hyphae and fruiting bodies.

Restlessness: both are constantly on the move [as are also the Bacteria.]

Tubercular Miasm: Resdessness. Also the idea of Transformation - the Tubercular miasm contains many geniuses, artists, composers; people who transform the mundane into the bizarre, unexpected and glorious!.

Energetic: both use great strength and energy to keep moving. The restlessness demands energy.

Strength and survival: the key to both families.

Bioluminescence·, both groups have the ability to glow in the dark. In some cases it is bacterially enabled.

Penetration: Insects sting; Fungi poison. Both penetrate by infiltration and persistence.

Decomposition: both the Fungi and the Insects give dedicated help in this natural process. *Water/ Damp:* People needing Insect remedies are usually very thirsty. The majority of Fungi prefer damp conditions.

Desire liquid food:

Desire Processed food: Both Insects and fungi process their food into a liquid state.

FUNGI RECIPES

In *Notes from an Italian Garden* Joan Marble writes a chapter entitled Mushroom Madness. She finds that her builders have disappeared ostensibly to go to the garage, and are seen to be carrying three large baskets in the back of the van on their return. The well-digger comments that they are fanatical fungaroli [mushroom hunters]. The following day Joan is initiated into the secrets of mushroom hunting. (Use stout sticks and baskets — never plastic bags — so that the spores can drop out and start the next year's crop; replace stones and dead leaves to protect spore and sites; leave the gambolling big dogs at home!)

" After a morning at the Femmina Morta [a particularly rich site for mushrooming] we found we had assembled five large crates of ftinghi. We drove them home and the women went to work to make lunch.

The first course was a raw mushroom salad, made from slices of the firmest and whitest ovoli, tossed together with chunks of good Gruyere cheese and a liberal handful of rocket salad. A salad dressing made with olive oil, crushed garlic and balsamic vinegar ties all this together.

When you are preparing a dish of raw mushrooms, it is essential to clean them thoroughly, and this is an art in itself. The Tolfa ladies warned against too much washing, as water tends to dilute the exquisite taste. Better to wash the mushrooms with a damp cloth to remove any dirt, or, if they are hard to clean, the dark spots can be cut off with a knife. Never soak mushrooms in water even for a short time.
For the second course we had spaghetti al porcino, which was simply a spaghetti sauce made of slices of mushrooms tossed in hot oil along with a generous amount of garlic and chopped parsley. This rich sauce is poured over thin spaghetti, known as spaghettini. Opinions vary on whether grated parmigiano should be added to this kingly feast, but the ladies of Tolfa voted to include the cheese.

The third course [for those still hungry] was porcini alia gratella, which means quite simply big porcini mushrooms under the grill. To make this you use only the caps, which you dampen with olive oil, then roll in a preparation of bread crumbs, chopped parsley and garlic, sprinkle them with salt and pepper and put

them on a plate directly under the grill. They should be grilled for ten minutes, turned once or twice and a little oil added. If properly grilled these porcini make a dish fit for a maharajah, soft and almost runny in the centre and crisp on the outside.

Mushrooms, it goes without saying, do very well with a fine white wine, preferably from Cerveteri or further north."

Marinated Mushrooms *from Angie Whatmore, Lincolnshire.*

2 lbs button mushrooms
Juice of one lemon

Marinade: 1 /4 pint olive oil
1/4 pint white wine
5 cloves crushed garlic
10 coriander seeds
Sprigs of parsley and thyme
Salt and pepper.

Wash mushrooms, pat dry and trim stalks.
Cover with lemon juice in pan and bring to boil.
Cook for 5 minutes then drain and cool.
Mix all marinade ingredients together and pour over mushrooms.
Leave in a cool place overnight and toss occasionally.

Penne With Mushroom Gorgonzola Sauce

www. mushroominfo. com/db/recipeDetails. cfmlRecipeID=298
Serves 6

3 cups penne pasta, uncooked
2 tbs. olive oil
1 tsp. Minced Garlic
1 lb. Fresh White Mushrooms, quartered (about 5 cups)
1/2 cup Oil-packed Sun Dried Tomatoes, thinly sliced & drained
4 oz. (1/2 cup) Gorgonzola or other blue-veined cheese, crumbled
3 cups Zucchini or Yellow Squash, sliced
1 pkg. (3 oz.) Cream Cheese, diced
1 tsp. Salt
1/2 tsp. Ground Black Pepper

DIRECTIONS

Cook pasta in salted water according to package directions. Drain and rinse under warm water; set aside in a large bowl covered, to keep warm. Meanwhile, in a large skillet over high heat, heat oil until hot. Add mushroom and garlic; cook, stirring occasionally, until mushrooms are golden and most of the liquid evaporates, about 5 minutes. Add zucchini and tomatoes; cook, stirring occasionally, until squash is tender, 5 to 7 minutes. Add to reserved pasta along with Gorgonzola, cream cheese, salt and pepper. Toss to melt cheese and coat pasta. Serve immediately.

Danish Creamy Morel Soup

www. mushroominfo. com/db/recipeDetails. cfm?RecipeID=365

Serves 6

4 oz. fresh Morel mushrooms; trim stem ends and slice in half lengthwise
1 lb. fresh Button mushrooms, wiped clean, stems trimmed
6 cups Vegetable Stock
1/4 cup Tawny Port
2 tbsp. Butter
1 cup Onion, coarsely chopped
1 tsp. ground Allspice
1 cup Heavy Cream
3 tbsp. Fresh chives or dill for garnish

DIRECTIONS

Melt butter in a cast iron skillet over low heat and saute onions until soft, about 10 minutes. Add fresh Button mushrooms and saute for about 10 minutes, add the Morel mushrooms and saute for 4 minutes more. Add vegetable broth, port, allspice, salt and pepper in a large soup pot and bring to a boil, reduce the heat and simmer, partially covered, for about 30 minutes. Puree half of the soup in a food processor or blender and return to the soup pot. Add the cream. Heat an additional 10 minutes to warm and garnish with chives or dill.

Mushroom Stroganoff

www. meadowmushrooms.co. nz/vegerecipe-mushrooml .htm

Serves 4-6

2 medium onions, sliced

5 sticks celery, chopped

4 tbsp butter or margarine

400g White Button mushrooms

1/2 tsp mixed herbs

1/2 tsp basil

1 heaped tbsp unbleached flour

1 1/4 cups stock salt & pepper 1/3 cup sour cream or plain yogurt chopped parsley paprika

DIRECTIONS:

Put the onions and celery into a large pan together with the butter or margarine and saute over a low heat until the onions are transparent. Add the mushrooms and cook for 2-3 minutes until the juices run. Add the mixed herbs and basil. Stir in the flour and cook for 1 minute. Add the stock and seasoning and allow to cook gendy for 8-10 minutes. Remove from the heat, stir in the sour cream and adjust the seasoning if necessary. Heat very gendy to serving temperature but do not allow to boil. Garnish with the chopped parsley and paprika and serve at once.

Serve on a bed of Walnut Rice - cook enough rice to serve 4-6 people and care- fully fold in seasoning, a little butter, 1 crushed clove of garlic and 1/2 cup finely chopped walnuts.

Nutty Portobello Mushrooms

www. meadowmushrooms, co. nz/freshrecipel2. htm

These mushrooms are delicious for an entree or with the addition of jacket potatoes and salad greens make an interesting vegetarian meal.

Anne Morton, Food Writer, Winner of Meadows Recipe 'Piate' Competition

6 large Portobello mushrooms
Lemon pepper
1/4 cup each finely chopped pistachios, almonds and hazelnuts
6 white button mushrooms - finely chopped
1/4 cup sliced black olives
Zest and juice of 1/2 lemon
2 tbsp dried white breadcrumbs
1/4 tsp each salt and ground pepper
2 tbsp extra virgin olive oil
1 egg
Sesame seeds
Shaved Parmesan

Using a damp paper towel, wipe mushrooms. Place into a lightly oiled baking dish. Season with salt and a generous sprinkling of lemon pepper. Set aside. Using a non-stick pan, dry toast pistachios, almonds and hazelnuts until golden (approx 10 minutes) stirring continuously. Remove from heat. Add white buttons, olives, lemon zest, juice, breadcrumbs, salt, pepper, oil and egg. Mix well. Divide mixture into 6. Carefully mould a portion over each mushroom, covering cap completely. Sprinkle with sesame seeds and shaved parmesan. Drizzle a little olive oil over each cap.

Bake at 180C for 20 minutes or until tender. Lemon wedges and a sprig of parsley make a good garnish.

GLOSSARY

Abducens nerve	A nerve conveying impulses from brain to the muscles that move the eye laterally in its socket.
Akathisia	A movement disorder characterized by a feeling of inner restlessness and a compelling need to be in constant motion as well as by actions such as rocking while standing or sitting, lifting the feet as if marching on the spot and crossing and uncrossing the legs while sitting. People with akathisia are unable to sit or keep still, complain of restlessness, fidget, and rock from foot to foot, and pace.
Amaurosis	Partial or complete impairment of vision.
Anamorph	An asexual fruit body produced during the life cycle of fungi.
Anastomoses	The connections of two or more parts of a naturally branching system, e.g. blood vessels, leaf veins. A fusion between fungal filaments (hyphae) to form a network.
Anthropophilic	Human loving
Antineoplastic	Plants that have the specific action of inhibiting and combating the growth of tumours.
Antiphlogistic	Preventing or inhibiting combustion.
Aplanospores	Non-motile spores
Arthralgia	Pain in a joint.
Arthropod	Invertebrate with jointed limbs, segmented body and exoskeleton of chitin, e.g. insects, centipedes, arachnids, crustaceans.
Arthrosis	A degenerative disease of a joint.
Asci	(pl.) The sacs in Ascomycetes in which the sexual spores are formed.
Ascus	Sac. [sing. See above.]
Ascites	An accumulation of serous fluid in the peritoneal cavity, causing abdominal swelling.
Ascomycetes	A group of fungi characterized by bearing the sexual spores in a sac.
Asthenia	Debility. Loss of strength, tone.
Ataxia	Unsteadiness in the use of arms and legs.

Remoulade Sauce

1 c. French dressing
1 c. Creole mustard
2 tbsp, paprika
1 tbsp, horseradish
1 tbsp, grated or minced onion
1 tsp. Worcestershire sauce
1/2 tsp. celery salt
Juice of one lemon

Combine ingredients. Blend thoroughly. Chill until ready to serve. Excellent for "Shrimp Remoulade" on a bed of lettuce.

Remoulade Sauce

2 hard cooked egg yolks, sieved
2 cloves garlic, crushed
1 1/2 tbsp, prepared mustard
1 1/2 c. mayonnaise (not salad dressing)
1 tbsp. Worcestershire
1 tbsp, paprika
1 1/2 tbsp, horseradish
Dash of Tabasco
2 tbsp, vinegar
1/4 c. finely chopped parsley
Salt & pepper to taste

Blend ingredients and chill. Makes about 2 cups. Go easy on salt and pepper.

Shrimp Salad: For shrimp salad, blend 1 quart cooked, chopped shrimp, 1/2 cup chopped celery, 1/4 cup chopped onion, 2 boiled eggs and enough Remoulade sauce to hold the mixture together.

Autolysis	The breaking down of cells by an enzyme produced within them.
Autotrophic	Organisms, especially green plants, capable of making nutrients from inorganic materials.
Azole	Azo- prefix: containing two adjacent nitrogen atoms between carbon atoms.
Basidiomycetes	A group of fungi characterized by the presence of spore-bearing cells called basidia.
Brackets	Shelf-like fruit bodies.
Bronchorrhoea	Excessive mucus discharge from the bronchi.
Buccal	Of the mouth, or of the cheek.
Bulla	A large fluid-containing blister.
Cap	The portion of the mushroom bearing the gills and tubes.
Cholangitis	Inflammation of the bile ducts.
Cholelithiasis	The formation or presence of gallstones in the gallbladder or bile ducts.
Chromista	Once considered Fungi, these potato blight organisms are now placed in their own kingdom.
Coccydynia	Persistent pain in the region of the coccyx.
Commensal	Relationship between organisms of two different species in which one derives food or benefits from the association while the other remains unharmed and unaffected.
Conidium	An asexually produced spore of certain types of fungi (pl. conidia.) Spores are produced from the hyphal tip.
Convex	A surface that is curved or rounded outwards.
Costal	Of the rib. [Costa (n.) — rib, or a part of something such as a leaf or wing, that resembles a rib.]
Decurrent	Running down the stem.
Delirium tremens	A psychosis of chronic alcoholism involving tremors and hallucinations.
Dermatophyte	A parasitic fungus that affects the skin, hair or nails.
Desquamation	Peeling or flaking of the skin.
Diaphysis	The central section of a long bone, between the growth areas at each end.
Diaphoresis	Sweating, induced for medical reasons.
Dikaryon	Cell with two nuclei.
Dimorphism	The existence of two or more different forms within a biological species, (e.g. Hortaea Werneckii which is a yeast when young and a mould when mature.
Diploid	Possessing two sets of matched chromosomes in the cell nucleus, one set from each parent.
Dyschromatopsia	Inability to distinguish colours.
Ecbolic	(Drug) helping childbirth or causing abortion.
Ecchymosis	A bruise; an effusion of blood under the skin causing discoloration.

Empyemic	Smelling of pus. Empyema is an accumulation of pus in a cavity (often the pleural) of the body.
Endocarditis	Inflammation of the membrane lining the heart - due to infection by micro-organisms, fungi, Rickettsia or rheumatic fever.
Endocrinopathy	Pathology of glands that excrete hormones internally directly into the lymph or bloodstream.
Endophyte	A plant or fungus that lives inside another plant. It may or may not be a parasite of its host plant.
Entomogenous	Fungi that parasitize insects or arthropods.
Ergot	A disease of cereals caused by the parasitic fungus *Claviceps purpurea* that grows in the ears of grain. Dried sclerotia of ergot fungus yield substances used to treat migraine and to induce uterine contractions during birth.
Erythema	Redness of the skin caused by congestion of the capillaries in its lower layers, as with any skin injury or inflammation.
Fasciculation	Bundle or cluster [of nerve, muscle, or tendon fibres].
Fibrous	Composed of fine fibres or threads
Flesh	Inner tubes of a fungus
Fruit body	Structure on which the spore-producing cells are held.
Furuncles	A boil on the skin.
Gamete	A specialized male or female cell with half the number of chromosomes that unites with another cell of the opposite sex in the process of reproduction.
Gametangium	The part of a plant, especially an organ or cell in algae and fungi, where gametes are produced.
Gill	Thin radiating plates on the underside of fungi where spores are produced.
Glabrous	Hairless.
Globoid	Shaped like a ball

Globose	See globoid
Haematopoiesis	The formation of red blood cells. Haematogenesis. Haemopoiesis.
Haemolysis	The destruction of the red blood cells and the release of the haemoglobin they contain.
Haemosiderosis	Excess of iron in the blood.
Haploid	Having a single set of unpaired chromosomes.
Haptic	Relating to the sense of touch.
Helot	In ancient Sparta, a member of a class of serfs claimed as property by the state but assigned to individual Spartans to work on their land.
Heterothallic	Common to the black bread mould (Rhizopus), which means that it is self-sterile.
Heterotrophic	Obtaining nourishment by digesting plant or animal matter.
Histopathology	A branch of pathology concerned with the study of the microscopic changes in diseased tissue
Homeostasis	A state of equilibrium, or a tendency to reach equilibrium.
Hygrophanous	Darkening when wet.
Hymenium	Layer of spore-producing cells.
Hypacusia	Diminished acuity of sense of hearing.
Hyperlipemia	An excessive level of fats or lipids in the blood.
Hypercholesterolemia	An abnormally high level of cholesterol in the blood.
Hypha (pl. hyphae)	A long, branching filament that, with other hyphae, forms the feeding thallus of a fungus called the mycelium. Hyphae are also found enveloping the gonidia in lichens, making up a large part of their structure.
Hyphomycosis	Infection caused by mycelial fungi with colourless walls; most are opportunistic.
Immunoceutical	Substances having immunotherapeutic efficacy.
Inrolled	Cells curled inwards and down.
Intertrigo	Inflammation from the rubbing of one area of skin on another.
Intrathecal	An intrathecal injection (often simply called “intrathecal”) is an injection into the spinal canal (intrathecal space surrounding the spinal cord), as in a spinal anaesthesia or in chemotherapy.

Isidia	Wart-like outgrowths that easily break off and grow into a new lichen.
Isomer	One of two or more molecules that have the same number of atoms but different chemical structures, and therefore different properties. E.g. bufotenin and psilocin.
Ischaemia	An inadequate supply of blood to a part of the body, caused by partial or total blockage of an artery.
Jactitation	A state of thrashing around uncontrollably, usually brought on by extremely high temperature, or occasionally by psychiatric disorders.
Kefir	Creamy drink made from fermented cow's milk.
Keratitis	Inflammation and swelling of the cornea.
Lagered	Stored
Lebensraum	Adequate room for life or development, (also additional land in Eastern Europe that the Nazi government claimed was necessary for the continued political and economic development of Germany.)
Lignin	The complex polymer that is laid down in plant cell walls to give varying degrees of rigidity.
Lytic	Causing the destruction of cells by disruption of the binding membranes. Lysis.
Macerate	To become soft, or to break up, by soaking in liquid.
Macropsia	A condition in which everything perceived by the eye appears to be larger than it really is.
Mannan	A complex carbohydrate found in the cell walls of some plants such as the carob bean.
Marginate	With a distinct ridge or gutter-like margin.
Metabolite	A by-product of metabolism.
Metaphysis	The junction of the epiphysis with the diaphysis in a long bone.
Methemoglobin	An abnormally altered form of haemoglobin that can occur as a result of poisoning with certain drugs or as a genetic disorder.
Methemoglobinemia	The presence of methemoglobin in the blood.
Micropsia	A defect of vision whereby objects appear smaller than they really are.
Milk	Sticky fluid released by some fungi when damaged.
Miosis (Myosis)	Contraction of the pupil of the eye, perhaps caused by drug reaction.
Mucormycosis	See Zygomycosis.
Muscae volitantes	Specks that appear to float before the eyes. Floaters.
Mutualists	Organisms living in mutual beneficial association.
Mycelium	The vegetative part of a fungus consisting of a mass of branching threadlike hyphae that exists below the ground or within another substrate.
Mycophagous	feeding on fungi (also: Mycetophagous)

Mycorrhiza	A mutually beneficial association of a fungus and the roots of a plant in which the plant's mineral absorption is enhanced and the fungus obtains nutrients, (e.g. conifers and orchids)
Mycosis	Any disease or infection of humans or animals caused by a fungus.
Mycotrophic	Used to describe a plant that lives in association with a fungus, as do various orchids in which the fungus lives on the roots.
Mydriasis	Excessive dilation of the pupils of the eye, usually caused by prolonged drug therapy, coma or injury.
Myelo-	Bone marrow or spinal cord/ column
Myositis	Muscle inflammation and soreness
Myotonia dystrophica	An hereditary disorder causing progressive muscular weakness and wasting.
Nephrotoxic	Poisonous to the kidneys.
Network	A mesh or pattern of criss-crossed fine ridges.
Neutropenic	Having a decreased amount of neutrophils [white blood cells].
Nummular	Shaped like a coin or disc.
Nystagmus	An involuntary rhythmic side-to-side eye movement.
Nystatin	An antibiotic drug used to treat fungal infections, especially thrush.
Oliguria	Deficient secretion of urine.
Onychomycosis	Infection of the nails by a fungus.
Organelle	Specialised part of a cell, e.g. the nucleus or mitochondrion that has its own particular function.
Oto-	Ear.
Oxytocic	Inducing or speeding up childbirth by stimulating the muscles of the womb and causing contractions.
Parenteral	A route of administration by which a drug, fluid, poison or other substance is brought into contact with the body.

	Parenteral: desired effect is systemic; substance is given by other routes than the digestive tract.
Partial veil	The fine web of tissue connecting the cap margin to the stem.
Pellicle	A thin film, membrane or skin. A multilayered flexible sheath lying beneath the cell membrane in many protozoans.
Peridium	The covering of the spore-bearing organ in many kinds of fungi. Skin.
Perithecium	A fungal flask-shaped fruiting body that contains spores, (pl. perithecia)
Phthisis	Any disease marked by wasting of the body. *Archaically* - diseases of the respiratory system e.g. asthma, tuberculosis.
Petechiae	Small purplish red spot on skin caused by effusion of blood.
Piloerection	Hair standing on end.
Pilocarpine	Poisonous colourless or yellow alkaloid from the leaves of the jaborandi tree (used to promote sweating and to treat glaucoma) $C_nH_{16}N_2O_2$
Pores	The openings of the clustered tubes in Boletes and Polypores.
Propagule	Bud or spore that becomes detached from the rest and forms a new organism.
Purine	A colourless crystalline solid that can be prepared from uric acid, and is the parent compound of several biologically important substances. C 5H4 $N_{/(}$
Recurved	Curving backwards, i.e. scales with recurved tips.
Remoulade	A spicy mayonnaise-based sauce.
Resupinate	Describing a plant part, particularly the flower of an orchid, which grows upside down or appears to do so.
Retinochoroiditis	Inflammation of the retina and choroids - membrane between the retina and white of the eye, containing blood vessels and large pigmented cells.
Rhabdomyolysis	Malignant disease of striated muscle entailing its destruction.
Rhagades	Cracks or fissures in the skin, especially around the mouth.

Rhinorrhoea Abnormal discharge of nasal mucus.

Rotifer A microscopic invertebrate animal with a wheel-shaped crown of cilia at the anterior end, living mostly in freshwater habitats.

Ring Remains of partial veil left on the stem.

Saprobe An organism that gets its nourishment from inorganic or decaying matter.

Saprophyte

Saprophyte used to be defined as any organism that obtained its energy from decaying animal or vegetable matter. Most species of Bacteria and Fungi were considered saprophytes. "Phyte" means plant. Saprophyte is thus an obsolete term because fungi and bacteria that feed on decaying organic matter are no longer placed in the Plant Kingdom. They should be termed saprobes or saprotrophs.

Scales Small to large raised flakes or flaps of tissue, usually on the cap or stem surface.

Sclerotium In fungi, a compact hard mass that contains stored food, (pl. sclerotia)

Septa (pl. of septum) A thin partition or membrane dividing something into two or more cavities.

Sesquiterpene Any of a class of terpene $C_{15}H_24$; *also·,* a derivative of such a terpene.

Siccative A substance that speeds drying. Absorbing moisture to promote drying.

Soredia Tiny balls of algae wrapped in fungal hyphae.

Sporangium A hollow spore-producing organism in fungi, ferns and some other plants. Pl. sporangia.

Spore Reproductive cell of typical mushroom.

Spore print A thick deposit of spores dropped by a mushroom onto paper.

Squamulose Covered in tiny scales of the type that make up the covering of fish, reptiles and some mammals.

Stem The 'stalk' on which a mushroom cap is raised up.

Stereotypy Pattern of fixed, persistent speech or movement that is meaningless and characteristic of some mental conditions.

Sterol A waxy colourless organic solid such as cholesterol or ergosterol, containing an alcohol group and found in animal and plant lipids.

Striated With distinct parallel grooves or lines especially at the cap edge.

Styptic Slowing down the rate of bleeding.

Succus A fluid secretion of plant or animal origin.

Teichopsia Temporary blurring of vision, with the appearance of multi-coloured zigzags of light before the eye, accompanying migraine.

Teleomorph	A sexual fruit body produced during the life cycle of fungi. The sexual stage of this cycle.
Terpenes	Any of a large group of volatile unsaturated hydrocarbons found in the essential oils of plants, esp. conifers and citrus trees. They are based on a cyclic molecule having the formula $C_{10}H_{16}$.
Thallus	The body of a plant such as an alga or liverwort that is not differentiated into leaves, stems and roots. Pl. thalli
Thiamine	One of the B group of vitamins, found in grains, meat and yeast. Vit. B_k
Tremorgen	A type of neurotoxin produced by members of the Clavicipitaceae.
Tryptamine	A crystalline amine found in plant and animal tissue, formed synthetically or by the decomposition of the amino acid tryptophan. $C_{10}H_{12}N_2$.
Tubes	The downward pointing clusters of tubes on Boletes within which the spores are produced.
Umbo	A small protuberance on a plant or animal part: the small nipple of the caps of some mushrooms
Universal veil	The fine to thick covering of tissue which envelops some fungi when immature.
Volar	Of the palm or sole.
Volva	Example of thick universal veil, which remains as a bag at the base of the stem.
Xerotolerant	Tolerant of dry conditions. Xero = dry.
Zoophyte	An invertebrate animal that looks like a plant, e.g. sea anemone, coral or sponge.
Zygomycosis	A fungus infection caused by various genera of the class Zygomycetes. Also called mucormycosis, phycomycosis.
Zygospore	A thick-walled sexual spore formed from the union of

two gametes in some fungi and green algae

Glossary compiled by Jenni Tree with help from:
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Index

Roman numerals refer to the Introduction

ABOUT THE AUTHOR

Frans Vermeulen is Dutch, living in Sweden with his wife and daughter. He spends his days buried in homeopathic literature, making forays out into the world to lecture, and lecturing in his Swedish School of Homeopathy in Stockholm. His love is to elucidate, categorize and structure huge amounts of homeopathic information, making a strong stable and secure base on which homeopaths may build their understanding of this complex medical art. To do this he chases every symptom to its source. So he himself is now a reliable source and resource for homeopaths.

FUTURE PLANS

Frans is currently working on Spectrum, a set of Materiae Medica divided into the Kingdoms. Books on non-vascular Plants, Plants, Minerals and Compounds, Gases, Imponderables and Animals of air, sea and land will follow this second book in the series. It is an encyclopaedic work, and of great benefit to Homeopathy.
Frans is also lecturing worldwide about his work.

BOOKS IN PRINT

Concordant Materia Medica [1994] — the practitioner's bible. This contains Materia Medica from Hering, T.E Allen, Boericke, Boger, Clarke, Cowperthwaite, Kent, Lippe, Pulford and Vermeulen. It is a concordance of annotated sources, clearly laid out, starting with the main characteristics of the remedy, and working in sections through from the Mind to the Modalities. Then follows a section on related remedies. This book contains the maximum number of reliable Materia Medica facts in the minimum space.

Synoptic Materia Medica [1992] — a handy reference of Materia Medica from many modern sources. 195 rxs. Great for learning the basics, the essence and for passing exams. Interesting reading. First published in 1992, and reprinted a dozen times since. Sold over 18.000 copies Updated in 2004 as:
The New Synoptic One. [See below.]

Synoptic Materia Medica 2 [1996] — continues in the vein of Synoptic Materia Medica to give valuable information on 'small' and unknown remedies.
However SMM2 is expanded to include Signs, Folklore, Comparisons, Botanical and Chemical information, which also bring the remedies to life.
A very useful chapter on Botanical relationships starts the book, followed by one devoted to food desires and aversions This book contains remedies made from

drug substances [Haloperidol, Amyl nitrate]; hormones [Corticotropinum, Folliculinum]; bacteria, [Streptococcinum]; the bowel nosodes; little known plants [Ocimum canum, Onopordon] indeed it takes remedies from every conceivable kingdom. This book brings together remedies about which little has so far been written. In 1996 it was ahead of its time. In 2004 however, these remedies take their place in more common usage owing to our increased understanding of the Periodic Table and the Plant and Animal Kingdoms. This is the only materia medica in which information about these unusual remedies can be found together.

Prisma: The Arcana of Materia Medica Illuminated is a fully expanded version of Synoptic One, containing the same remedies, and also an encyclopaedic amount of information on the source, zoology, chemistry, physics, habitat, distribution, folklore, mythology and history of the remedies. This contextual material is absolutely fascinating reading, bringing the medicinal substances vibrantly to life. Whereas Synoptic One and Concordant Materia Medica are vital books for the student and clinical reference texts, Prisma is all this, plus bedtime reading too.

The New Synoptic One, 2004. An updated, re-edited reference based on the 'out-of-print' Synoptic Materia Medica of 1992. Contains the fresh ideas of many modern writers and draws on the standards of our basic texts too. Easy to read, fascinating. Also contains material from Jan Scholten and Rajan Sankaran — Sensation and Miasm, and stage in the periodic table. An essential for Essence and Exams!

TRANSLATIONS

Concordant Materia Medica is available in German [Konkordanz MM]
Synoptic Materia Medica 1 is available in French, German, Russian, Chinese and Japanese.Roumanian in 2008.
Synoptic Materia Medica 2 is available in German and French, Russian, Italian 2007
Prisma: The Arcana of Materia Medica Illuminated is available in German Bulgarian, Italian 2007, Japanese 2008.
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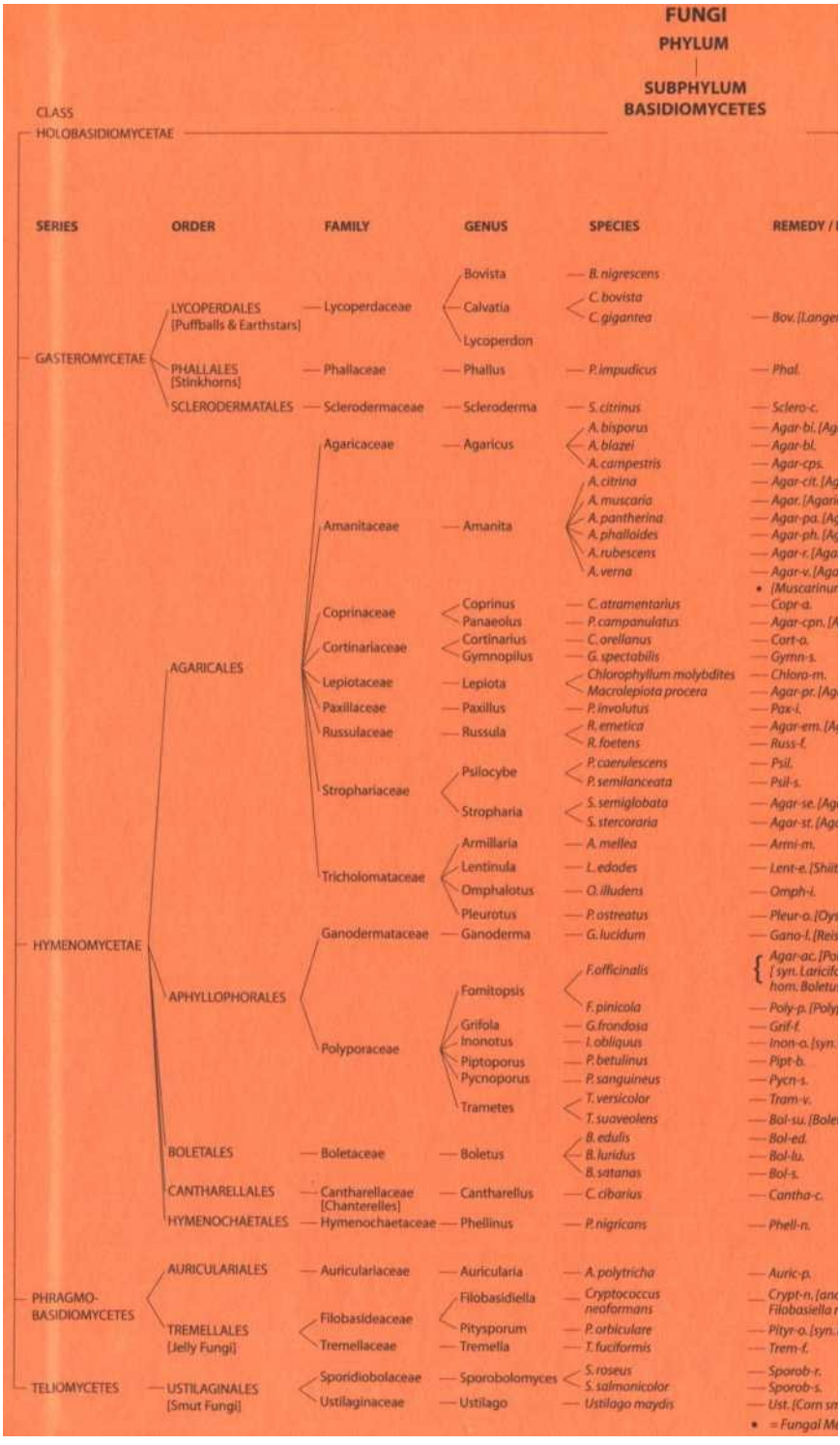
FUNGI
PHYLUM
SUBPHYLUM
BASIDIOMYCETES
CLASS
HOLOBASIDIOMYCETAE
SERIES
ORDER
FAMILY
GENUS
SPECIES
REMEDY /
GASTEROMYCETAE
LYCOPERDALES [Puffballs & Earthstars]
Lycoperdaceae
Bovista
B. nigrescens
Calvatia
C. bovista
C. gigantea
Bov. [Lange
Lycoperdon
PHALLALES [Stinkhorns]
Phallaceae
Phallus
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Phal.
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Scleroderma
S. citrinus
Sclero-c.
HYMENOMYCETAE
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Agaricus
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Agar-bi. [Ag
A. blazei
Agar-bl.
A. campestris
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Amanita
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A. pantherina
Agar-pa. [Ag
A. phalloides
Agar-ph. [Ag
A. rubescens
Agar-r. [Aga
A. verna
Agar-v. [Aga
• [Muscarinu
Coprinaceae
Coprinus
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Copr-a.
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P. campanulatus
Agar-cpn. [A
Cortinariaceae
Cortinarius
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Cort-o.
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G. spectabilis
Gymn-s.
Lepiotaceae
Lepiota
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Chloro-m.
Macrolepiota procera
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Paxillus
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Pax-i.
Russulaceae
Russula
R. emetica
Agar-em. [A
R. foetens
Russ-f.
Strophariaceae
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P. caerulescens
Psil.
P. semilanceata
Psil-s.
Stropharia
S. semiglobata
Agar-se. [Ag
S. stercoraria
Agar-st. [Ag
Tricholomataceae
Armillaria
A. mellea
Armi-m.
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L. edodes
Lent-e. [Shit
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Omph-i.
Pleurotus
P. ostreatus
Pleur-o. [Oy
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Ganodermataceae
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G. lucidum
Gano-l. [Reis
Polyporaceae
Fomitopsis
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Agar-ac. [Po
[syn. Laricif
hom. Boletu
F. pinicola
Poly-p. [Poly
Grifola
G. frondosa
Grif-f.
Inonotus
I. obliquus
Inon-o. [syn.
Piptoporus
P. betulinus
Pipt-b.
Pycnoporus
P. sanguineus
Pycn-s.
Trametes
T. versicolor
Tram-v.
T. suaveolens
Bol-su. [Bole
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Boletaceae
Boletus
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Bol-ed.
B. luridus
Bol-lu.
B. satanus
Bol-s.
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Cantharellus
C. cibarius
Cantha-c.
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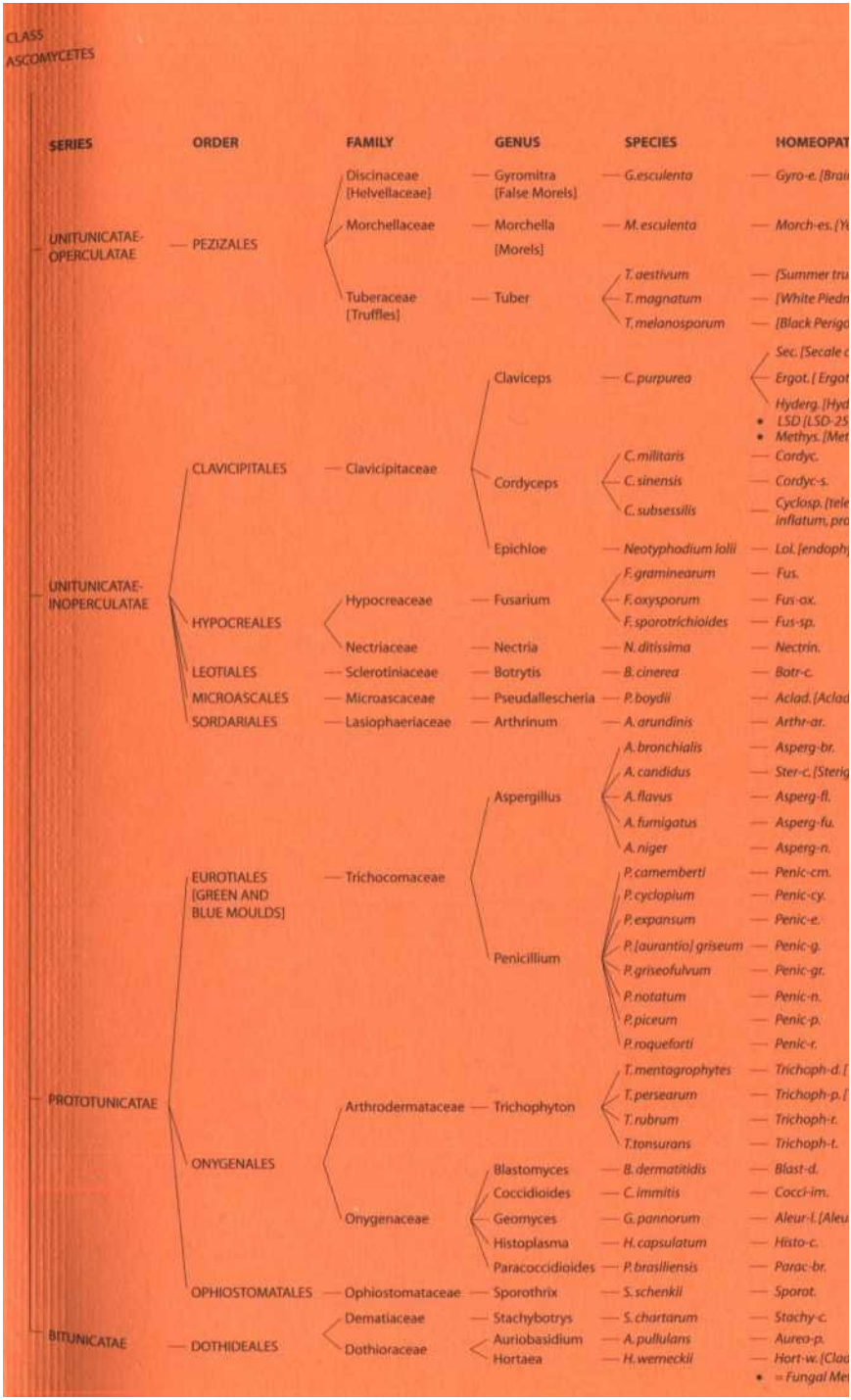
Hymenochaetaceae
Phellinus
P. nigricans
Phell-n.
PHRAGMO-BASIDIOMYCETES
AURICULARIALES
Auriculariaceae
Auricularia
A. polytricha
Auric-p.
TREMELLALES [Jelly Fungi]
Filobasideaceae
Filobasidiella
Cryptococcus neoformans
Crypt-n. [an
Filobasiella
Pityosporum
P. orbiculare
Pityr-o. [syn.
Tremellaceae
Tremella
T. fuciformis
Trem-f.
TELIOMYCETES
USTILAGINALES [Smut Fungi]
Sporidiobolaceae
Sporobolomyces
S. roseus
Sporob-r.
S. salmonicolor
Sporob-s.
Ustilaginaceae
Ustilago
Ustilago maydis
Ust. [Corn sm
• = Fungal M


CLASS
ASCOMYCETES
SERIES
ORDER
FAMILY
GENUS
SPECIES
HOMEOPAT
UNITUNICATAE-OPERCULATAE
PEZIZALES
Discinaceae (Helvellaceae)
Gyromitra (False Morels)
G.esculenta
Gyro-e. [Brai
Morchellaceae
Morchella (Morels)
M.esculenta
Morch-es. [Y
Tuberaceae (Truffles)
Tuber
T.aestivum
[Summer tru
T.magnatum
[White Piedn
T.melanosporum
[Black Perigo
Claviceps
C.purpurea
Sec. [Secale c
Ergot. [Ergot
Hyderg. [Hyd
LSD [LSD-25
Methys. [Met
UNITUNICATAE-INOPERCULATAE
CLAVICIPITALES
Clavicipitaceae
Cordyceps
C.militaris
Cordyc.
C.sinensis
Cordyc-s.
C.subsessilis
Cyclosp. (tele inflatum, pra
Epichloe
Neotyphodium lolii
Lol. [endoph
HYPOCREALES
Hypocreaceae
Fusarium
F.graminearum
Fus.
F.oxysporum
Fus-ox.
F.sporotrichioides
Fus-sp.
Nectriaceae
Nectria
N.ditissima
Nectrin.
LEOTIALES
Sclerotiniaceae
Botrytis
B.cinerea
Botr-c.
MICROASCALES
Microascaceae
Pseudallescheria
P.boydii
Aclad. [Aclad
SORDARIALES
Lasiophaeriaceae
Arthrinum
A.arundinis
Arthr-ar.
EUROTIALES (GREEN AND BLUE MOULDS)
Trichocomaceae
Aspergillus
A.bronchialis
Asperg-br.
A.candidus
Ster-c. [Sterig
A.flavus
Asperg-fl.
A.fumigatus
Asperg-fu.
A.niger
Asperg-n.
Penicillium
P.camemberti
Penic-cm.
P.cyclopium
Penic-cy.
P.expansum
Penic-e.
P.[aurantio] griseum
Penic-g.
P.griseofulvum
Penic-gr.
P.notatum
Penic-n.
P.piceum
Penic-p.
P.roqueforti
Penic-r.
PROTOTUNICATAE
ONYGENALES
Arthrodermataceae
Trichophyton
T.mentagrophytes
Trichoph-d. [
T.persearum
Trichoph-p. [
T.rubrum
Trichoph-r.
T.tonsurans
Trichoph-t.
Onygenaceae
Blastomyces
B.dermatitidis
Blast-d.
Coccidioides
C.immitis
Cocci-im.
Geomyces
G.pannorum
Aleur-l. [Aleu
Histoplasma
H.capsulatum
Histo-c.
Paracoccidioides
P.brasiliensis
Parac-br.
OPHIOSTOMATALES
Ophiostomataceae
Sporothrix
S.schenkii
Sporot.
BITUNICATAE
DOTHIDEALES
Dematiaceae
Stachybotrys
S.chartarum
Stachy-c.
Dothioraceae
Auriobasidium
A.pullulans
Aureo-p.
Hortaea
H.werneckii
Hort-w. [Cla
= Fungal Me


CLASS
ORDER
FAMILY
GENUS
SPECIES
HOMEOPATHIC NAME/ information
SACCHAROMYCETES
ENDOMYCETALES [SACCHAROMYCETALES]
Ascoideaceae
Candida
C. albicans
Moni. [Cand-a.] [Monilia albicans]
C. kefyr
Kluyv-ma. [anamorph of Kluyveromyces marxianus]
C. parapsilosis
Cand-p.
Saccharomycedaceae
Kloeckera
K. apiculata
Kloeck-a. [Sacmy-a] [Saccharomyces apiculata]
Saccharomycetaceae [Yeasts]
Kluyveromyces
K. lactis
K. marxianus
Kluyv-ma.[teleomorph of Candida kefyr]
Saccharomyces
S. carlsbergensis
Cerev-lg. [Cerevisia lager]
S. cerevisiae
Tor. [Torula cerevisiae]
PHYLUM ZYGOMYCOTA
TRICHOMYCETES
ZYGOMYCETES
ENTOMOPHTHORALES
Entomophthoraceae
Entomophthora
E. muscae
MUCORALES
Mucoraceae
Mucor
M. mucedo
Mucor.
Rhizopus
R. nigricans
Rhiz. [=Rhizopus stolonifer]
PHYLUM CHYTRIDIOMYCOTA
BLASTOCLADIALES
CHYTRIDIALES
HARPOCHYTRIDIALES
MONOBLEPHARIDALES
SUBPHYLUM LICHENS
ASCOLICHENS
LECANORALES
Cladoniaceae
Cladonia
C. pyxidata
Cladon.
C. rangifera
Cladon-r.
Parmeliaceae
Cetraria
C. islandica
Cetr.
Usnea
U. barbata
Usn.
PELTIGERALES
Lobariaceae
Lobaria
L. pulmonaria
Stict. [Sticta pulmonaria]
BASIDIOLOCHENS
LICHENS IMPERFECTI