

Fire and Fungus: The Etymological Journey Continues...

by Tamara Spillis

This author is not an etymologist, but works as a tanner and taxidermist and teaches ancient living skills such as brain tanning of leather; bone and stone tool making; and identification of edible, medicinal and useful plants: A philologist at heart and taxidermist by trade. This article is an assemblage of facts and speculation from personal experience, research, friends and mentors. It may strike a cord of insight or light a match anew in keeping with our reader's understanding and culture.....perhaps the reader will linger in contemplation as familiar words discharge a volley of new questions with old answers. As Solomon opined truly, there is nothing new under the sun – it is we who are newly informed.

In our Winter 2004 issue, we attempted to uncover and reconstruct lost technological uses of fungi associated with fire. We traversed islands in time known as “The Ages” ...and observed an ironic marriage: a dependence on the lowly fungi for creature comfort, and domestic and technical progress. These included fire-drills, textiles, oil lamps, matches and flint and steel strikers. We pondered whether bioluminescence signaled that mushrooms were repositories of fire. We learned of ancient **tachewood**, its **technical** use with the bowdrill (bow =arc in Latin) in **carpentry** and **architecture**. We made the case for fire and by extension to what fire has come to represent: weapons; from mushrooms in a simple fire kit to the mushroom cloud over Hiroshima; lighting technology; and even nuptial bliss.¹ Our journey took us into the Tyrolean Alps to ponder the life and times of Ötzi the Ice-man; to ancient ruins in Greece, Rome and Egypt to wonder at the promenade of fire deities and the practical worth of their arts as new replaced old. And the fungi figured mightily. But as men mined the earth for ore, mineral deposits of coal, bitumen and sulphur began to serve as sources for light and heat. As agrarian societies developed, metallurgy replaced rock as a source of weapons and tools, and textiles of linen and wool replaced leathers. Forests – a repository of fungi – were incinerated to fuel foundries and forges. Naturally,

or not, the use of fungi diminished. Oils and fats were commercially developed as fuels. Twilled wicks of fiber replaced fungi as lampwick.

This Summer issue will explain making of charcoal, slog through swamps in China to explore pyrotechnic fungi (as in fireworks). We will inevitably encounter gunpowder, follow it from there to Arabia, and learn a whole new practical use for walls. We will muster with troops armed with matchlocks in 14th - 18th century Italy and Europe. We will see matchlock muskets meet their eventual demise due to the old/new flint and steel muzzleloaders and then head back to China to fathom Genghis Khan's mythic mystical moniker.² We may have to postpone the hypothetical origins of moxa/muxabustion which will take us to Japan and China (again!) and also the tobacco connections until a later issue. Much of the etymological groundwork was laid in the Winter 2004 issue so it might serve to have it on hand – more will be brought to bear.

Fungal Charcoal

So where to start? Let's get our hands dirty right away. We're going to make charcoal... more precisely fungus charcoal. Here is what you will need: An empty metal paint can with lid; a nail; enough perennial polypore³ broken into fist size or smaller chunks to fill the can; an outside campfire or burn barrel or a public park with a grill. Fill the can with polypore chunks, punch one hole in the

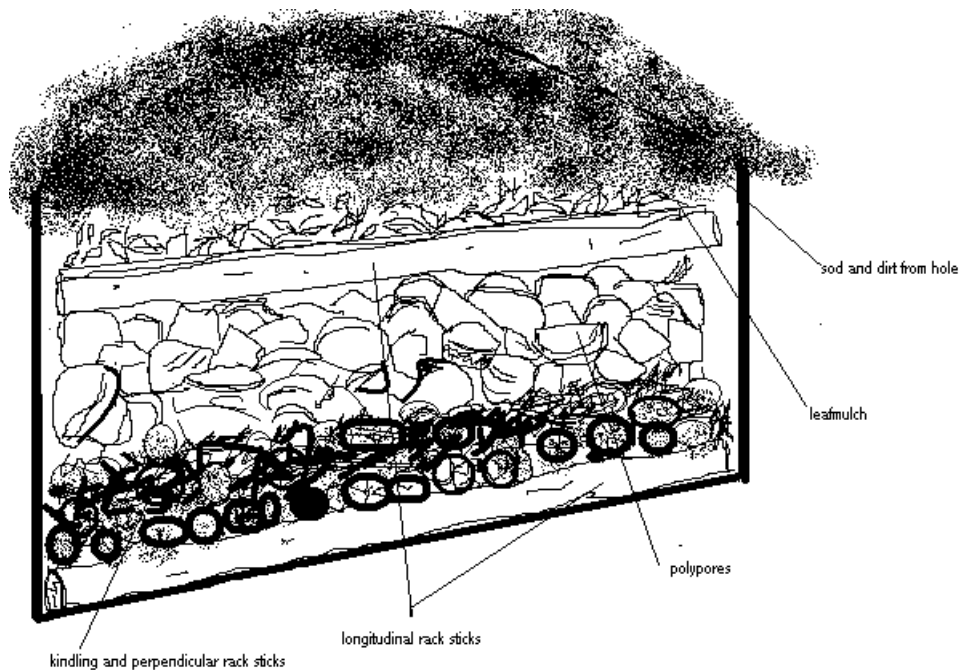
middle of lid with said nail (you may use a hammer to do this), replace lid on can tightly (if it is not tight, the expanding gases will blow it to who-knows-where). Place the can in the fire or on the grill rack. Point the can away from you. This is what will happen: the volatile gases will heat and blow out the vent hole, producing an effect similar to a propane torch. But a flame from the nail hole is not necessary for charring to occur; moisture and gases will be expelled as foggy smoke and this is good enough to get the job done. As these gases vent and combust, the bodies of the fungi stay intact. Because there is no oxygen in the can, incomplete combustion occurs. Eventually the gases will exhaust and the charcoal is done. But... don't take the lid off the can 'til absolutely no warmth can be felt. Otherwise the charcoals will spontaneously combust and you dear reader will be disappointed at your impatience. Take the can out of the fire and let it cool overnight. When opened the charcoal should be black as corn smut. That is nice, tinder-ready charcoal. The blacker it is, the more readily it catches a spark from a striker.⁴ It will also grind down nicely for gunpowder: polypores generate a finer grain charcoal than wood and therefore produce superior gunpowder. If it is brown/black it is called a brand and can be recharred. These undone chars can be kindled with a striker but not so easily, and don't work at all for gunpowder.

¹ As with the word kindle discussed last issue, the word technology may have double entendre in ancient Greek: To fashion or cut out *and* to bring forth offspring as in building a family. See **tek-1** and **tek-2**: American Heritage Dictionary 1973 Indo-European Roots

² Temujin, 'Blacksmith Thunder'

³ *Ganoderma*, *Fomes* or other woody small-pored genera work well.

⁴ Detailed in Winter 2004 *Mushroom the Journal*.



Nowadays, this same procedure is used to make char-cloth from patches of cotton and linen and charcoal from wood; but anciently, textiles were labor-intensive and precious, not wasted when fungi were abundant. Paint cans were in short supply too, so the pit method was used. To make fungal char for home use: choose a stretch of two or three dry days. Rain will not help. Dig a rectangular pit about 2 wide by 3 feet long. Make it 18 to 24 inches deep. The bottom should slant from a high of 18" at one end of the pit (a diagonal) to a low of 24" at the other end. Keep the sod layer intact as much as possible. It will be used to mound over the pit after initial firing. Have on hand damp leaf mulch to plug any major air leaks and a five gallon bucket of dirt (taken out of the hole) which will be shoveled over the sod and leaf mulch mound to create a kiln effect. To prepare the kiln first lay wood sticks parallel to the length of the pit. These long pieces will act as channels for ventilation and also support the bottom rack that is made of short pieces of wood laid perpendicular to the long sticks. The slanting bottom of the pit allows the heated gases to follow the channels between the long pieces of

wood (at the very bottom of the pit) and flow upward and out. Similar to the venting action in the paint can. An extremely slow draft is accomplished as oxygen is used up and the mound slowly implodes, preventing complete combustion. A "charge"⁵ of fuel is laid in close and about 6 inches deep, laid perpendicular to the long bottom sticks of wood. This can be kindling wood and some stout hard wood such as oak or ash. The "charge" is to initiate burning to reach a critical temperature that will be held as the mound is built. Stack polypores 6-8 inches deep over the kindling. You may use a liquid accelerant on the kindling but not on the polypores... (If you want to be period correct use animal fat, vegetable oil or pine pitch etc.) The fuel and polypores must be stacked closely. Too much space will hold too much oxygen and may allow complete combustion. Then lay some stout long sticks close together and parallel to the length of the pit over the polypores and perpendicular to the kindling rack. This top rack will support the mound of leaf mulch and sod.

Now fire the kindling. Let it really take hold. As it fires lay the damp leaf

mulch over the top rack from one side to the other about 2-3 inches deep. This will slow the intake of oxygen; now place the sod back in place as a lid, grass side up. Shovel enough dirt on it to cover the grass about half the depth of the hole. This is not to be air tight (gases have to escape). Go away for two days. As the kiln chars the load, the mound will collapse. Do not open it until completely cooled. Wait if in doubt. Other wise it will combust. And don't step in it!

As an interesting microbiological note to all this labor is the word anthrax. This is not a modern medical epithet. The ancient disease was so named by the Greeks and later Latinized. It is a virulent bacterial pathogen of cattle, sheep and man. It takes the form of a blister resembling a fiery coal and then crusts over to a black scab resembling charcoal and was dubbed 'anthrax', meaning "glowing coal or charcoal".⁶ Similarly in our day, anthracnose, a black crusty fungal disease hosted by the plant family Rosaceae. So on to pyrotechnic fungi and gunpowder.

Blackpowder/Gunpowder

Gunpowder is the stuff of legends, the stuff in firecrackers and various incendiary devices. Also known as black powder (color from charcoal content) until firearms became known as guns. It has three ingredients: sulphur, carbon (charcoal) and potassium nitrate or sodium nitrate. Sodium nitrate can be derived from urine but is considered inferior because it is hygroscopic (absorbs moisture from the air), but it works well in a dry climate. The proportions of ingredients determine whether an explosive charge, slow or fast fuse charge is achieved. We will entertain the etymology of "fuse" further along in the article. I made some fungal fuses (also known as "slow-match")⁷ and slow-fuse powder using fungus charcoal for this article (a terrifying experience). All ingredients must be ground separately, mea-

⁵ **kers-2** To run ..carry. *American Heritage Dictionary* 1973, "Indo-European Roots"

⁶ Eric Partridge, *Origins, A Short Etymological Dictionary...*

⁷ Refer to Winter 2004 *Mushroom the Journal* "match" etymology

sured proportionately by weight and mixed together wet, similar to biscuit dough but no oven. Please no oven. The mixing is the do or die part. Always mix wet. Here rain will help. Recipes for slow fuses and out right blasting powder can be located on the internet and we will not take responsibility for such recipes. But fungal charcoal *was* and *is* considered a superior source of carbon (along with willow and alder charcoal) – it pulverizes into a fine dust that exposes more surface area to oxygen translating to big bang fast. Purified potassium nitrate is necessary for blasting and that required some doing. Who invented it first? Whatever made them think to make it? And what more, if any, hyphal insinuations can be intimated or documented in this amalgam of information?

Who Gets the Fame/Blame?

Who invented blackpowder first? Some say the Arabs, some say the Chinese. Documentation leans toward the Chinese as using black powder for firecrackers early, around 200 BCE.⁸ Another source says that by 75 CE it was adapted to fireworks⁹ and “In 1045, a Chinese government official named Tseng Kung-Liang wrote a complete account of the Chinese use of gunpowder, including its adaptation to weaponry. Called “Wu-ching Tsung-yao” (Complete Compendium of Military Classics), the work detailed the use of ballistic fire arrows launched not by bows, but by charges of gunpowder.”¹⁰ Documentation also indicates Arab alchemists having recipes for purifying potassium nitrate as early as the 7th century CE.

Potassium and sodium nitrates had been used very early (4000 BCE) for metallurgy fluxes and tanning leathers,

What’s the big deal with these nitrates?

Well, an explosion is just burning that goes really, really fast. Or rather, when something burns fast enough, the expanding vapor can’t disperse quickly enough into the surrounding air before more expanding air piles up behind it. The shock wave of compressed air is what we call an explosion. Thus, anything that will make the burning go more quickly makes the reaction more explosive. This is why the very fine fungal charcoal is more explosive: being finer, it has more surface area per amount, which burns more quickly because the surface is where it interacts with oxygen.

A nitrate is an unstable compound that’s basically a nitrite plus a couple of extra oxygen atoms. If heat is applied to the nitrate, its extra oxygen sort of bubbles off, leaving a nitrite behind and providing lots of instant oxygen to help speed up the burning. Besides the nitrates listed here, there’s also the popular Oklahoma/Iraq oxgenator ammonium nitrate.

tanning being the more ancient craft. As a side note; the words tan; (as in drums made of stretched skins), tone; thunder; astonish, detonate; tinder and sound (stretching of a line of gut or cord to produce music as in stringed instruments) seem to reach back in time and converge in a Sanskrit word *tan*,¹¹ meaning to stretch.

So who made blackpowder first? Paradoxically, opposite environments

sometimes produce similar results. Arabs and Chinese knew saltpeter very anciently for tanning and metallurgy and yet from diametrically opposed resources and environment. Arabia is desert with much rock and mineral deposit. These mineral salts leach when saturated and evaporated. An Arab physician described purifying salt peter in 1029. Known most importantly as natrun, it was also known as tanner’s salt, flowers of stone, wall salt and salt of stone.¹² And here may be the *true* meaning of saltpeter (Petra=rock in Greek). It is an excrescence resembling salt found at the base of *rock* or *stone walls*. This precipitate was probably caused by an ancient custom of urinating on walls (Tamara’s theory)¹³ which is still acceptable in some societies but has no practical purpose any longer, except the obvious. Al-Hassan also mentions a 13th C. recipe that uses the Arabic word “harraq” as synonymous with tinder for charcoal but not the same as willow used for making charcoal in a pit kiln. Would any of our Arab readers know if this word for “tinder” has the same relationship to the fungal tinder “touchwood”, described in our previous issue? I found a definition of harraq which says when it’s used as a personal pronoun, it means “consumed by fire”. Here is the recipe:

“Take dry willow wood, burn it, bury it (smother it) as is with the *harraq* (tinder). Take by weight two thirds of saltpetre and one third of ashes of wood, which has been carefully pulverized, and put the mixture into the jar, and if the jar is made from copper so much the better. Add a little quantity of water and apply heat until the ashes and saltpetre no longer adhere together. Beware of sparks”.

⁸ Cliff Lethbridge, *History of Rocketry*. Chapter 1, Ancient Times Through the 17th Century

⁹ *A Dictionary of Dates*. Cyril Leslie Beeching, editor. Publisher: Oxford University Press. 1997

¹⁰ Lethbridge

¹¹ Walter W. Skeat, *A Concise Etymological Dictionary of the English Language* .

¹² *Gunpowder Composition for Rockets and Cannon in Arabic Military Treatises In Thirteenth and Fourteenth Centuries*.

¹³ Urine and fecal matter have been used for thousands of years in leather tanning and manufacture of gunpowder and are still collected for such. If you want to know more just ask. This is perhaps why God had Moses remove his sandals while standing on Mt Horeb and linen not leather was kosher for the priestly garb...

China knew saltpeter as Ta-lu. And oh, how they knew it. Much of China was vast swampy marshland. Millions of acres of arable land were physically wrested from stagnant bogs beginning in the 5th century BCE by a systematic repetitive cycle of brush burning and drainage (ad infinitum) as canals and levees were built, the power of the earth was eventually harnessed for farming of rice and other crops. This ingenious communal effort was known as “hoeing with fire and water” leaving behind, as residue, saltpeter,¹⁴ – millions upon millions of acres of saltpeter. And this is why I believe China had gunpowder first. After the bogs were burned and drained, saltpeter was precipitated. In the burning of the brush, from season to season a ready carbon source met its “match” with saltpeter... Hello firecrackers.... toss in some sulphur and let the fireworks begin. Stuff it in some bamboo **cane** and you have made a firecracker, a **cannon**¹⁵ or a rocket depending on the size and placement¹⁶ of the vent holes. The Chinese were probably the first to say...“point the can away from you”.....

So to answer the question why did they think to make it? With China it may have been an outgrowth of agricultural practices leading to the happy find – not planned, but improved upon and refined. And 200 BCE is a quite reasonable guess in keeping with known agricultural progress. As the swamps were tamed, the demons and the dragons and beasts were scattered by this joyful invention.

And much later the Chinese launched cane arrows with gunpowder. China had

an abundance of cane...which could carry charges of poisons or chemicals in the hollowed chambers. “The Chinese typically launched these fire arrows in salvoes from arrays of cylinders or boxes¹⁷ which could hold as many as 1,000 fire arrows each. The fire arrows propelled by gunpowder may have had a range of up to 1,000 feet,” notes the same source; “Mongols employed a potent form of fire arrow described as causing “thunder that shakes the heavens”. These may have been primitive grenades launched by gunpowder propelled fire arrows. A single one of these was reportedly able to burn a 2,000 foot area.¹⁸ This controlled application of concussive thunder and fire and the sheer magnitude of the fiery fusillade made Mongol armies the dread of Asia. And with Arabia, why did they make it? An area rich in mineral deposits and ore, metallurgy practices and experimentation with flux and fuels may have led to deliberate purifying of saltpeter and some explosive results in alchemy.

And now we come to two fungal tangents: *Fuses*, without which incendiary devices such as firecrackers, cannons and matchlock weapons would not explode in a timely fashion; and Genghis Kahn’s legendary designation *Temujin*.

Fuses, Metallurgy and Blacksmith Thunder

In the *Winter Journal*, we discussed the intimate relationship of polypore mushrooms (anciently known as agariks) and fire spindles... They were inseparable. The fire spindle was driven by hand or bow (arc) and the polypore was the hearthboard.¹⁹ We pondered the Iceman’s fine 99% pure copper ax and

his reserve of mushrooms. What if any thing was the bridge between these two disparate possessions? A **fuse**. A fuse was literally a wooden spindle and he carried many in his kit.²⁰ Keep this in mind: *the fuse carries the fire the touchwood takes the fire*. This principle has been transferred from one supplanting technology to the next until touchwood vanished altogether from the technology as a **hearthboard**²¹ and inconspicuously metamorphosed and *became the fuse!* Here’s how: The wooden spindle (**fuse**) served to ignite fire by friction in the touchwood, this is an ageless technique, still true, but labor intensive. It teamed up with flint to accomplish carpentry “boring”, synonymous etymologically with the word fire (pyr) and burn²² in this occupational endeavor charcoal (**fusain**) and its heat concentrative qualities came to be appreciated and brought to bear on soft metals (**fusile**), thus the Iceman’s copper axe. Agrarian societies developed, and spinning of fibers was mastered. The wooden spindle fuse was finally replaced by an iron striker (**fusil**) striking against flint to carry the fire to twisted or torqued fibers of fungal wicks or linen or flax and even charcoal. **Here** is where the touchwood *becomes* the fuse (**fusee** or **fuzee**). This fungal fuse would carry the fire to blackpowder or a torch or a candle or cigarette for that matter.²³ Now that *is* full circle no? And now only remnants are left in such phrases as: “touch-hole” “touch-off” “tick-off” “touchy” indicative of incendiary action or hot temperament. Similarly the term “short-fused”(quick tempered) “Strike a cord” indicates initiation of a process which once set in action will culminate quickly or ultimately

¹⁴ “Chinese Civilization,” in *The History of Civilization*, edited by C. K. Ogden, M.A. Publisher: K. Paul, Trench, Trubner. New York 1930

¹⁵ Greek cane/kanna from whence cannon

¹⁶ Umm, and direction – LS

¹⁷ It may be coincidental, but fire boxes depicted at the source site had what appeared to be Ling Chi (*Ganoderma lucidum*) painted on them.

¹⁸ Lethbridge. In 1258, the Mongols were reported to have used gunpowder propelled fire arrows in their effort to capture the city of Baghdad. The Mongols reportedly launched gunpowder propelled fire arrows from ships during their attacks on Japan in 1274 and 1281.

¹⁹ See Storm’s article “Usefulness of Polypores in Fire Making” in *Winter 2004 MtJ*

²⁰ See *Winter 2004 Journal* etymology: *Artemesia*, tarragon, absinthe, sage etc.

²¹ Linked to *Artemesia* and Artemis. See *Winter 2004 Mushroom the Journal*

²² See *Winter 2004 Mushroom the Journal*.

²³ In the *Winter 2005* issue we will see a similar transformation in the muxabustion trail but in contrast the fuse (spindle) will be the changeling and become the moxa.

in presupposed consequences (whether that is a physical or an emotional response).²⁴

In the Winter 2004 *Journal* we discussed how spindles were replaced by flint pyrites, then flint was used in combination with metal pyrite and with the advent of the metallurgical revolution forests, the repositories of touchwood, vanished and metal tools and mineral deposits began to serve in its stead. So this is “how” the touchwood metamorphosed to become the fuse. Modern dictionaries and etymologists trace several words back to one Latin source “*fusus*” “*spindle*” and from there anciently to an Indo-European Root word “*gheu-*” to melt metal.... but fail to venture across the bridges and infer relationship. This may be from a lack in understanding the use of fire spindles and touchwood in early technology or quite rightly from a scholarly temerity. But I am no scholar of merit and so will venture to cross the bridges, presenting these words with definitions and etymologies to draw out some ideas of semantic evolution. See if it clicks for you. Can you see the shift in meaning as the fuse carries the fire? Can you see the founding of the Iceman’s ax?Or 5000 years later....the horrendous poetic irony as the *fuselage* of Enola Gay carries atomic fire, which vaporizes part of our human family, and leaves only a mushroom cloud in their place...as an iconic threat to extinction of human progress and endeavor... where once the literal shroom served as a benefactor. Technology is at once seducer, benefactor and reducer.

I have included several related fuse/mushroom/spindle words to tease some imaginations. To be consistent, these are all taken from The American Heritage® Dictionary of the English Language: Fourth Edition. 2000.

fuse¹ **1.** A cord of readily combustible material that is lighted at one end

to carry a flame along its length to detonate an explosive at the other end. **2.** Often **fuze** A mechanical or electrical mechanism used to detonate an explosive charge or device such as a bomb or grenade: “A *mechanical . . . switch is used to initiate the fuzes*” (International Defense Review). From Italian *fuso*, spindle (originally from its shape), from Latin *fusus*.

fusain **1a.** Fine charcoal in stick form, made from the wood of the spindle tree. **b.** A sketch or drawing made with this charcoal. **2.** A dull dark-gray, brittle, porous type of bituminous coal resembling charcoal French, spindle tree, charcoal made from its wood, from Vulgar Latin **fusago*, **fusagin-*, spindle (formerly made from the wood of a spindle tree), from Latin *fusus*.

spindle tree See **euonymus** ETYMOLOGY So called because the wood is often used to make spindles

burning bush **1.**....certain species of *Euonymus*, having foliage that turns bright red in autumn

fusile *Archaic* **1.** Formed by melting or casting. **2.** Capable of being fused; fusible. Middle English, from Latin

fusilis, from *fusus*, past participle of *fundere*, to melt. See **gheu-** below.

fusee also **fu-zee** **1.** A friction match with a large head capable of burning in a wind. **2.** A colored flare used as a warning signal... **4.** A combustible fuse for detonating explosives. From French *fusée*, spindle, rocket, flare, fuse, from Old French, spindleful of thread, from *fus*, spindle from Latin *fusus*.

fusil A light flintlock musket. French, steel in a flintlock, firearm, from Old French *fuisil*, steel for a tinderbox, from Vulgar Latin **focilis* (*unattested*) (*petra*), fire-(stone), from Late Latin *foculus*, fire, from Latin, hearth.

fuselage The central body of an air-

craft, to which the wings and tail assembly are attached and which accommodates the crew, passengers, and cargo. French, from *fuselé*, spindle-shaped, from Old French *fusel*, spindle, from Vulgar Latin **fusellus*, diminutive of Latin *fusus*.

fusion **1.** The act or procedure of liquefying or melting by the application of heat. **2.** The liquid or melted state induced by heat. **3a.** The merging of different elements into a union: the fusion of copper and zinc to form brass.... **b.** A union resulting from fusing... **4.** Physics A nuclear reaction in which nuclei combine to form more massive nuclei with the simultaneous release of energy. Latin *fusio*, *fusion-*, from *fusus*, past participle of *fundere*, to melt. See **gheu-** in Appendix I

foison **1.** *Scots* Physical strength or power. **2.** *Archaic* A plentiful harvest; abundance. **3.** **foisons** *Obsolete* Reserves of power; resources Middle English *foisoun*, from Old French *foison*, from Latin *fusio*, *fusion-*, a pouring, from *fusus*, past participle of *fundere*, to pour. See **gheu-**

gheu- To pour, pour a libation. Oldest form **gheu-*, becoming **gheu-* in centum languages. Derivatives include *gut*, *funnel*, *fusion*... **I.** Extended form **gheud-*. **1.** Zero-grade form **ghud-*, *gut*, from Old English *guttas*, intestines, from Germanic **gut-*. **2.** Nasalized zero-grade form **ghu-n-d-*. *foison*, fondant, fondue, font², found², funnel, fuse², fusile, fusion, Latin *fundere*, to melt, pour out

So... those are some things to think about... *Euonymus* is anciently the burning bush/spindle tree. A lot of trees and bushes turn red in the fall, so the color probably wasn’t why it was called burning bush. It may have had to do with its use for fire spindles. The word **foison** and **foisonner** turned up in my old Larousse’s French English dictionary

²⁴ Leon: Really? I thought “strike a chord” (diff. spelling) meant something that you respond to, as with an inner quiver

Tammy: Yes, but in this instance it does not refer to music, but matchcord.

Leon: But of course it does, because “chord” comes from the use of strings to make sound. Similarly, perhaps, “heart-strings”. And there is the Latin word for heart: “cor” which may come from that which is set fire to.

Tammy: Of COURSE! I stand **corrected**: music (*tone*; sound) predates fire techniques and stems from the same Sanskrit root *tan*.



The Fire, by Giuseppe Archimboldo, 1566

(vintage 1966) while searching out the word mushroom. The definition was thus: "To be plentiful, to abound; to swarm; to swell to buckle." So I included it for its archaic obscurity. Note its ultimate etymology from *fusus*, past participle of *fundere*, to pour, the same word that means literally: spindle... "[Perhaps this has something to do with the way the polypore swells and buckles its way out of the tree. Also, if you think of a straight tree swollen about half-way down with polypores, you get a direct link to the spindle shape. – LS]

So let's see some written fungal evidence" is what you're thinking? Well... 'The door banged open, somebody screamed. You oughta heard just what I seen'²⁵

Arcimboldo's 'Fire'

First we must thank the Italians: Explorers, Historians, Archaeologists, Artists and Laborers: Grazie. Let us here present a painting by Giuseppe Arcimboldo a 16th C Italian artist: *The Fire!*

Absolutely breathtaking.... Specifically portraying the progression of fire and weaponry.... Beginning with fire and charcoal in the brain (conception of idea) perhaps forging of red-hot iron flaming from his skull; tinder mushrooms in the form of felted and twisted 'German tinder' (amadou) *Fomes fomentarius* or *Phellinus igniarius*, the true and original matchcord, just under the flaming hair trailing down to the steel striker ear... perhaps to catch the spark of the striker as it bangs against the cheek of flint; and also (a contemporary technique) dangling to the brow to touch the smoldering end of *artificial* matchcord (now spun flax or hemp with perhaps a fungal core); we see the nose of flint pyrite overlaid with a steel striker for prominence; a brass oil lamp for chin and throat with a tongue of flame licking up toward a mustachio of fuzees.

Lamps were lit with fuzees which carried the fire from the flint and steel to candles, torches, matchcord etc. A candle or firecracker fuse for an eyeball; and as his carotid artery (?) where the life blood courses... a fused candle with several wicks flaring (perhaps pretreated with saltpeter);²⁶ and finally emanating from his torso where a booming heart of flesh should reside are blackpowder musket and cannon. We thus have a chronology of fire, weapons and light technology with the earlier techniques at the top and what was then modern warfare at the bottom. This composite depicts unabashedly a creature that thinks, eats, talks and breathes fire. All senses are expressed: hearing, sight, taste smell and touch as being inextricably enmeshed in fire... The Fire of Arcimboldo... Gordon Wasson²⁷ had located and documented this painting. I merely found the website sponsored by a contributing editor to this magazine, Elio Schaechter et al.: The Online Mushroom Art Registry, <http://members.cox.net/mushroomsinart/>

I also found separately the web page of an archeological dig and exhibit, in Italy 1988, documenting the fire guild of Italy that is represented in the ornaments around the neck of this painting. Quite extraordinaire! The "seeds" of fire are represented as imprisoned within polished pyrites and freed by stylized strikers of gold. Here is the web link: **An Exhibit sponsored by Cassa di Risparmio and the Comune of Bassano del Grappa, Piazzotto Montevicchi - Bassano del Grappa:** <http://www.endex.com/gf/family/fsf/lepietredelfuoco/PF.E.htm>. It corroborated the use of mushrooms anciently at Star Carr (England, Mesolithic), and "fuzees" for fire starting and tobacco use (which will be covered separately in future article) and had a wonderfully detailed explanation of the mechanics of matchlock and later flintlock weaponry.

But it did not give me a source for what I wanted in the worst way to say: *that* matchlock weapons and earlier incendiary devices at one time used a fungal fuse. These guns were known variously as "fusils"; "fusees"; "fuzees"; "muskets".²⁸ The matchcord cord of these muskets was looped and carried like a lariat with one end constantly burning to touch off the powder. It was very dangerous to try and load a musket barrel with a live match under your arm at the same time. The matchlock musket was first depicted in a 1411 manuscript. Germany developed the first match lock by which matchcord was held secure (locked), though still constantly burning. By applying pressure on a trigger, one pivoted the fuse toward the touch hole. The matchlock had arrived! War was now safer.

These weapons lost their touch when supplanted by flintlock muskets. You see they had a fatal drawback: they slowed the progress of war. Why of course they did. Fighting at night was ludicrous: your positions were obvious, as fuses of hundreds of matchlock men sparkled on the battlefield. And war in the rain was nearly impossible.

Returning to the painting, we see that hemp or flax supplanted amadou as matchcord. Nobody says this outright, we just see it...the history of fire and mushrooms under the flaming hair: the twisted, felted amadou cord dangling down...almost touching the ignited artificial match cord of the brow. But then ...note this bit of history: "All matchlocks were based on the same firing principle: a matchcord (a loosely braided cord of hemp or flax soaked in a salt petre solution, allowed to dry, which burned at a slow rate of four to five inches an hour)... pulling the trigger, acted ...to depress the serpentine/matchcord onto the flashpan causing the ignition process."²⁹ *and then a source for what I wanted to say...* Another Ital-

²⁵ "Who Do Ya Love?" Bo Diddly, funky singer-songwriter

²⁶ Leon, *please* don't ask me to try this.

²⁷ Author of *Soma Divine Mushroom of Immortality*

²⁸ I'm thinking musket can be traced to China and Marco Polo but that's next issue's *muxa moxa* trail to be followed).

²⁹ *History of Armour and Weapons Relevant to Jamestown*, National Park Service

ian scholar to the rescue... Silvio A. Bedini: His book *The Trail of Time: Time Measurement with Incense in East Asia*.³⁰ He uses this quote from the “diary of Matteo Ricci (1552-1610), founder of the Jesuit mission in China. In an entry probably written in about 1601 while he was in Beijing, he noted that in China there were few means for measuring time and these were by means of water or fire, and “. . . of those operated by fire, time is measured by an odoriferous ash, like the tinder sticks or **touchwood of our guns**.”³¹ Bedini elaborates as to the what touchwood is by quoting an Asian author: “punk or match cord was used by the Japanese in the same manner that it had been employed in China for timetelling purposes, and presumably the practice had been borrowed by the Japanese from the Celestial Empire. ‘The knotted match cord, the simplest form of incense time measurer, consisted of a length of specially prepared cord composed of punk which was knotted at measured intervals. Punk is made of dry decayed wood, or from a **spongy substance prepared from fungi**. Each of the spaces between knots would indicate a period in the passage of time measured by means of the progress of the cord’s burning. Punk, like incense, burns slowly and at an even rate, and the knotted cord was commonly used as a time alarm among the poorest classes. A length of **match-cord made of punk**, knotted for the period of time desired, was placed between the user’s bare toes and ignited before the user, such as a military sentry on night duty, fell asleep. When the cord had burned down to the skin, he would be awakened...”³² Let’s stop to reason on this:

If fungal fuses were used between the toes of the *military sentry*... should we think that was the primary purpose for which they were designed....to wake up sleeping guards? Or was that an extended application of an existent weapon technology? The Italian Ricci said: **“like...the touchwood of our guns”**³³ not the match or matchcord but touchwood.

In summary, there seems to be enough data to reasonably conclude that fungal fuses were used for touching off blackpowder in incendiary devices. They were also prepared with saltpeter as time telling devices and perhaps for timed bombs by the Chinese Celestial Empire. We know of China’s abundant fields of saltpeter which quite probably led to their happy discovery of blackpowder circa 200 BCE. Matchcord’s burn rate, as mentioned, of “four to five inches an hour” could be manipulated by the addition and proportions of charcoal and sulphur. And isn’t Arcimboldo’s *The Fire* worth a thousand words? And don’t forget our dictionary and etymology guesswork. What do you think reader? Got any solid references? Send it to Leon.

Temujin/Blacksmith Thunder

What we have all been reading for... the fungal roots of Genghis Khan. We must thank Gordon Wasson³⁴ for bringing to our attention documentation of an account by Marco Polo who spent 20 years at the court of Kublai Khan, the grandson of Genghis. “Speaking of the Uighur, a Mongolian tribe,”³⁵ he tells us “they say of their Khan³⁶ who first ruled over them³⁷ that he was not of human origin but was born of one of

those excrescences on the bark of trees, and that we call esca. From him descended all the other Khans.”³⁸ There you have it: Genghis Khan descended from a mushroom. Well not exactly, but from *esca*. The Italians knew esca as the tinder polypore that grows on birch. And so did the Mongols, perhaps as zhagra or tchaga. Birch has a host specific relationship with *Fomes fomentarius* and *Amanita muscaria*, the gilled mushroom known as mukhomor,³⁹ which at the time seemed unrelated to esca. The Italians had blackpowder and muskets and knew the power and value of this esca; so did the Mongols. So what were they telling Polo? They were thunder men by birthright. It was not happenstance or luck that bequeathed their domain... it was destiny. Marshes and swamps have been etymologically linked with tinder fungus in many European and Nordic languages. Before you think this is a stretching of imagination please consider the following material:

Webster’s 1913 Edition: Date “swamp” was first used in popular English literature: sometime before 1682. Etymology: Swamp \Swamp\, noun. [Compare to Anglo-Saxon swam a fungus, Old Dutch swam a sponge, Dutch zwam a fungus, German schwamm a sponge, Icelandic sv[“o]ppr, Danish & Swedish swamp, Gothic swamms, Greek somfo`’s porous, spongy.]. Danish yields “tondersvamp” (thunder-mushroom) for *F. fomentarius*.

To the right is a recent translation, by late scholar Ksenia B. Kepping, of subtle hidden meanings in written and tonal description in the translation of the name Temujin. From an encyclopedia we have this explanation of Genghis Khan’s name: “At birth he was named

³⁰ Cambridge: Cambridge University Press, 1999

³¹ Italics mine

³² *Tokei Hattatsu-Shi*, a work on the “Development of Clocks” by Hyoe Takabayashi

³³ Author’s Italics

³⁴ Famous for his research on *Amanita muscaria*, Wasson wrote of *Fomes fomentarius* in its “sister fungi” relationship with *A. muscaria* on birch in Russia and Siberia. His documentation is illuminating.

³⁵ Mongols were not the same as the Chinese proper. They were descended from the Tungusi or aboriginal stock, with a strong mixture of Iranian and Turkish blood a race that is now called Ural-Altai, nomads of high Asia that the Greeks named Scythian.

³⁶ Khan is a contracted form of khakan meaning sovereign

³⁷ Perhaps 5th Century

³⁸ *Il Libro di Messer Marco Polo*, edited by L.F. Benedetto et al Milan and Rome 1932

³⁹ The subject of Wasson’s research

*Chinggis Khan's Name Encrypted in a Tanhut Song*⁴⁰

Ksenia B. Kepping

“Chinggis Khan’s last campaign against the Tanguts (1226-7) proved to be fatal to both sides. Legend tells how the Great Khan met his death on Tangut territory in August 1227, and this same year is regarded as that of the total destruction of the Tangut state (982-1227) at the hands of the Mongols

Let us start with the three characters which I translate as ‘Blacksmith Thunder’. The ‘blacksmith’ etymology of Temujin, the name given to Chinggis Khan at birth, is well known and there is little doubt that ‘Blacksmith Thunder’ stands in the song for Temujin. The first two syllables mean ‘blacksmith’ and the third seems to be his name (rather his nickname). The two syllables comprising the word for ‘blacksmith’ — *mbin* ‘ie — belong, in my observation, to the ritual language vocabulary, the first character standing for ‘gold’/‘metal’ and the second for ‘master’. The corresponding common language word is *sion kie* (literally ‘iron master’), and is found, for example, in the Tangut Code.

It is noteworthy that *mbin* ‘is homophonous with the word meaning ‘*membrum virile*’. Thus, readers may understand this collocation as ‘*membrum virile* + master’. Another homophone is ‘high’, ‘lofty’ which is included into the Tangut indigenous name for their Empire *phon mbin lhie lie* ‘The Great State of the White and Lofty’.

The third syllable is the character *rew* ‘marsh’, ‘swamp’, but I believe that this character stands here for its homophone meaning ‘thunder’. Thus both parts of Chinggis Khan’s name in the song are conveyed in a cryptic way.”

Temuchin (also spelled Temujin), meaning “blacksmith” from the Turkic words *temur* (iron) and *jin* (smith).”

But now it seems there is much more richness to add to this moniker. She holds that “gold/metal” is synonymous with “blacksmith” which in modern times we think of as pertaining to iron only. But recall that it was soft metals such as copper and even gold that were first smelted and fused by the intense heat generated by charcoal polypores. Iron was the last of metals to be smithed. This would indicate a *very* ancient history for this word character (from the Iceman’s days) which conferred much honor (weight) upon any man who carried it.

Also noteworthy is the third syllable of his name, which Kepping calls his nickname: a syllable that can be read either as “swamp” or “thunder”. The swamp is the habitat of the *esca* fungus, from which the khans believed they were descended; and the artificial thunder of explosive weaponry is its result. This name thus positions Temujin as both the cause and the effect of the Khanate, the alpha and omega of his people.

As for the *Fomes* itself (pictured to the right), it was aptly qualified to be the male generative principle that engendered the Khans. It persisted perennially through all seasons, regenerating itself when broken, adding to itself year after year. Under the influence of fire, metals – the strongest, hardest things known – became liquid and took whatever form was willed by the smith. But not the *Fomes*, which retained its shape and hardness when being turned into charcoal. In fact, this transformation made it even more powerful, as it thus acquired many of the fire’s properties: it could be used in forges to smelt or smith metals, and it could be ground into blackpowder to rival the thunder of the heavens and bring the devastation of fire

from the sky upon its enemies. Thus, the “*membrum virile* high and lofty” may itself be the excrescence, or *esca*, growing high on the birch above the swamps, the “thunder-mushroom” that engendered metals, blackpowder and, as the Khans believed, even themselves.

A Trail of Significance

I’m starting to view mushrooms as the building blocks of the world... after the fall of Babel. Thus, from Agarikons to the Mongols we’ve seen peoples whose early existence was so dependent on mushrooms for fire, technology and weapons that they defined themselves by that relationship. If you the reader have some other input on these imaginations send them along. Something from your own language, culture or research? So...there we have some more things to think about until our next installment when we continue our journey and follow the *muxa/moxibustion* trail. It is an intriguing trail entwining faeries, midges, mygies, and punkies while tracing *moxie* and *mugwort* and *moguls* all the way to the tobacco habit. Meanwhile keep the sparkle in your eye and your powder dry!

Mushroom



⁴⁰ IDP News, Newsletter of the International DUNHUANG Project. No. 19, Winter 2001. ISSN 1354-5914. [There were numerous internal citations in this passage, indicating where in the work of Li Fanwen a given phrase was elucidated. Those really bogged down the reading, so I (LS) have just taken them out here. If anyone really really wants the citations, I will be happy to provide them.]