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The Brain Bank North West

Science in the City

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The science behind the myths: Are there clinical explanations for vampires, zombies or werewolves?

October 31, 2012 by The Brain Bank North West

When people don't understand how something works, they often come up with their own explanations. For example, when ancient societies didn't understand where lightning came from, they attributed it to an angry god. Thus the myth of the lightning god was born.

This tendency of humans to create their own explanations for unusual phenomena may have led to the invention of mythological creatures such as those now seen dominating fantasy writing and films. From a scientific point of view, it is interesting to investigate the source of these myths. How did they come about and why did they become so popular?

With Halloween approaching, I have decided to dedicate a blog entry to the potential 'scientific' explanations behind some of our favourite and most enduring mythological creatures: vampires, zombies and werewolves!

Vampires.





Vampires have always been amongst the most popular mythological creatures, from the tales of Bram Stoker to more modern incarnations like those in Buffy the Vampire Slayer and Twilight. However, in case you have been living in a cave and these have all bypassed you, here is a brief overview of the vampire legend: vampires are generally believed to be man beings who, in life, were bitten by another vampire and then return after death to feed on the blood of other humans. Vampires are generally assumed to never die naturally but, depending on which adaptation you read, can be killed by exposure to sunlight, garlic, holy water or direct penetration through the heart with a wooden stake. Vampires are now a pretty popular part of modern culture, but how could the myth have first come about?

Although few scientific papers exist on this topic the internet is rife with debate and appears to point to several different medical conditions:

Probably the most popular theory of the origin of the vampire is the disease porphyria: as explained by [this article in Scientific American](#). Porphyria is actually a term for several diseases which are all caused by irregularities in production of heme, a chemical in blood. Some forms of this condition, such as cutaneous erythropoietic porphyria (CEP), lead to deposition of toxins in the skin. Sufferers are often sensitive to light since light activates these toxins. When active, toxins eat away at the skin causing disfigurement, including erosion of the lips and gums. These factors could have led to the corpse-like, fanged appearance that we associate with vampires and their dislike of sunlight. Interestingly, people who suffer from porphyria also have an intolerance to foods that have a high sulphur content...such as garlic.





Mycobacterium tuberculosis

Another possible explanation for vampires is tuberculosis (TB). This is a lung disease caused by the bacterium Mycobacterium tuberculosis. The reason [this disease has been suggested](#) as the origin of the vampire myth is because victims turn very pale, often avoid sunlight and cough up blood. This is actually due to the disease damaging the lungs, but it's easy to see how it could be misinterpreted as someone having recently drunk blood. According to [this study](#), the vampire myth may also have arisen from the fact that TB spreads rapidly and easily from person to person. The infectious nature of this disease may have led to the belief that the vampire rises from the dead to feed on his loved ones, causing them to suffer the same symptoms.

An intriguing alternative explanation is [Catalepsy](#). This is a disease of the central nervous system leading to a slowing of the heart and breathing rate, with sufferers often seizing up completely. These symptoms may have led people to mistakenly believe the sufferer to be dead. Therefore, since these individuals were perceived to have risen from the dead, it is easy to see how this disorder could be linked to paranormal mythology.

Zombies.



Ah, the zombie apocalypse, ever a popular scenario in films and books. Some organisations, such as the [Centers for Disease Control](#) in the USA even run “zombie apocalypse” days so you can prepare for what to do when the end is nigh. ^

Zombies are usually defined as people who were once human, but have been altered in some way so they no longer have a sense of self. Usually the sufferers have died and then been re-animated with a surprising taste for human brains. Zombies pursue this delicacy relentlessly. Often, anything that has had its free will removed and is bending to the will of others is also referred to as a “zombie”.



The zombie myth is believed to [have originated in Haiti](#). There are many examples in Haitian and voodoo folklore of corpses which have been re-animated and used as slaves by sorcerers. The existence of zombies was [explored scientifically in 1982](#) by Dr. Wade Davis after a man, Clairvius Narcisse, claimed to have been brought back to life by a sorcerer. Dr. Davis examined samples of the “zombie powder” which the sorcerer allegedly used to create his zombies. He found that the powder contained several toxins, including tetrodotoxin, which is found in pufferfish. Dr. Davis theorised that the tetrodotoxin caused paralysis and a death-like appearance in the sufferer, but that this state would eventually wear off, giving the illusion that the victim had been raised from the dead. He wrote two books on the subject, called *Passage of Darkness* and *The Serpent and the Rainbow* (the latter of which was used as the basis for a horror film). However, some sources do not believe that Davis’s work is scientifically valid due to the fact that the tetrodotoxin level in the “zombie powder” were actually found to be quite low. There was also some speculation that Davis’ work could have been plagued with murky ethics following reports of alleged grave-robbing.

Film depictions of the zombie apocalypse usually hint that it is rapidly spread by a pathogen such as a bacteria or virus. This may have some root in real life, as there are a number of known pathogens that are suspected of causing behavioural changes. As explained in this [blog](#) by fellow Brain Bank-er Sarah the parasite *Toxoplasma gondii* can control the behaviour of rats. The rats behave in a “zombie-like” manner, going against their natural instincts to actively seek out cats – the parasite’s true target. There have been some suggestions that *toxoplasma gondii* can affect the behaviour of humans too, making

men more jealous and women more 'warm hearted'. If *T. gondii* or similar parasites are ever able to affect humans in a way that modifies their behaviour to extremes well ... hello, zombie apocalypse! (In the interests of not scaring you too much, I should point out that this scenario is very, very, unlikely).

However, there are other ways of creating a Zombie. Scarily, some current scientific techniques may one day be capable of creating 'zombies'! Scientists are now capable of controlling some aspects of behaviour in certain laboratory animals using targeted laser light to activate groups of genetically modified neurons, this technique is known as optogenetics (for more detail see this [post](#) by fellow Brain Bank-er Natasha). This notion of behavioural control of 'loss of free will' is spookily similar to the depictions of some of the mindless zombies seen in popular culture. However, the ultimate aim of this technology is much less sinister, it is actually being used to investigate how the nervous system works and how problems may be corrected when things go wrong.



Werewolves.



Werewolves appear to be having a mini media renaissance, thanks to Professor Lupin from the Harry Potter books and all of Team Jacob. Legend has it that werewolves spend most their time in human form but then, on the full moon, transform into a giant man-eating wolf with no human conscience. The werewolf usually turns back into a human at sunrise, with no recollection of their wolfish activities.

Lycanthropy, the clinical name given to werewolves in fiction, is actually a real medical term referring to someone who is under the delusion that they are a wolf.

Some medical theories concerning the origin of werewolves were explored in the book *Why do Men have Nipples?* by Billy Goldberg and Mark Leyner. One of these is once again based around porphyria, the same disease with links to the vampire myth. Some sufferers of cutaneous porphyria exhibit the canine "fang" look caused by the erosion of the gum

Also, following exposure to light, the healing blisters on sufferers' skin often grow a fine layer of hair.



Someone suffering from congenital hypertrichosis universalis



Some authors also speculate that the disease congenital hypertrichosis universalis could be the cause of the werewolf myth as this also causes excessive hair growth across the whole body. However, this disease is extremely rare so may not be prevalent enough to have bred such a popular myth.

Another possible reason behind the werewolf myth is the disease rabies. Rabies most famously affects dogs, but can also be transmitted to other animals. Its most characteristic feature is foaming at the mouth but it also causes hydrophobia (fear of water), aggressiveness, hallucinations and delirium. If an infected animal bites a human, they will suffer from similar symptoms. Possibly, in the past, someone noticed that a human bitten by a rabid dog took on the same characteristics and thought that the person was literally becoming a very aggressive dog or wolf. However, rabies doesn't explain the all-over hairiness or link to the lunar cycle most people associate with werewolves, particularly as, if you believe Noel Coward, sufferers of rabies famously come out in the midday sun.

According to howstuffworks.com, the idea of men turning into wolves has been a part of folklore since ancient times, but was popularised by the 1941 film *The Wolf Man*. It is therefore possible that the myth of werewolves, unlike vampires and zombies, has been shaped more by popular culture than medical science.

My boyfriend suggested that being a woman may also be an origin for the werewolf myth. He decided to point out that women tend to get a bit aggressive at certain times once a month. This suggestion was met with a stony silence and being made to pay for dinner "I think it may have been a full moon)." ^

So, there is no clear scientific explanation for these myths, but the subjects continue to fascinate and intrigue us. More and more films and books are being produced which revolve around these mythical horrors, often meaning that the origins of the myths become further buried as authors and film-makers add new characteristics and traits (However, that doesn't make unearthing the science behind these enduring and popular creatures any less interesting). As you can see from some of the articles here, scientists are using the popularity of these myths, especially zombies, to raise awareness of very real and potentially dangerous situations such as the rapid spreading of a deadly disease. Since these stories can be used both to entertain and educate, keep the tales coming!

Post by: Louise Walking Dead



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Louise Walker

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27 thoughts on "The science behind the myths: Are there clinical explanations for vampires, zombies or werewolves?"



mohamad

October 31, 2012 at 1:57 pm | Reply

may be next days we are going to see one of having lunch with us in our house (or could be we are the lunch) , as a veterinary there isn't something impossible

Pingback: [狼人、僵尸、吸血鬼传说起源的临床医学解释](#)



**Amunyu**

March 12, 2013 at 1:32 am | Reply

Nice! It's only logical. But my problem with this explanations is the myth is told differently in different societies. In my society the myth is not about vampires, zombies or werewolves. It is rather associated with 'hyenas'. According to the myth there are certain individuals who have the power to control hyenas and command them to do their works just like the compelling power of vampires. It is hereditary and not transmitted. They feed on human flesh but not while it's alive. They make their target sick to death and they feed on its flesh by resurrecting it within three days of its death. You can find similar myth among different societies and it makes you question what if there is really something that we human beings could not explain through reason? Just curious ...

**Samantha**

July 24, 2013 at 10:36 pm | Reply

Werewolves, zombies, and vampires are REAL trust me they are

**tej**

August 19, 2013 at 5:03 pm | Reply

there is no such things as vampires.i thnk u watched too much movies like twilight. or serials like vd

**R.A.L.G.**

September 18, 2014 at 4:13 am | Reply

I am saying...yes they are real..though they were just told in exaggeration.



**Cody barnhardt**

December 1, 2014 at 4:10 am | Reply

I opened a pack of raw steak a few days ago for thanksgiving and was about to cook it when apparently something somewhere inside of me was like "hey! That looks delicious! Let's just eat it raw!" And I did... Does this make me a werewolf/vampire/zombie?

**madeline**

May 25, 2015 at 6:17 am

no that makes you a looney who is probably going to die.

**Heshia**

July 19, 2015 at 12:53 am | Reply

I agree, I mean werewolf, Vampire, and Zombie stories are so popular they gotta be real. But over the years every thing probably got exaggerated.

**Olivia**

October 14, 2013 at 2:48 pm | Reply

i believe in people and animals having strange side affects on a full moon but i dont believe in anything such as zombies or vampires. i am a very superstitious person though (i take from my mum and dad). this is a gr8 website and it has provided a lot of answers, thank you!



**Olivia**

October 14, 2013 at 2:51 pm | Reply

**madeline**

May 25, 2015 at 6:18 am | Reply



Pingback: [What's the difference between a vampire and a werewolf? | What's The Diff!](#)

**Ellya Farahanny**

November 9, 2013 at 6:52 am | Reply

Hey guys. I'm a genetics student and currently doing my 2nd year in my local university in Malaysia. I hope by reading your blogs, my curiosity and critical thinking skills can be enhanced as I'm lack of both. I just wanna say your blog is awesome and please keep us updated with interesting topics! Terima kasih (Thank You in "Malay")

Pingback: [Real Vampires by J.B. Doyle | Life Paths 360](#)

Pingback: [Origin of the Vampire | Deakin SciCom 2014](#)



Pingback: [Vampire Stiinta | Human Textuality](#)



Tiff

December 28, 2014 at 8:45 am | Reply

Geez!! The photoshopped zombie actually made me jump. An interesting read, Thanks!



KuraiKokoro

May 27, 2015 at 6:56 am | Reply



I think that was from garrys mod.

Pingback: [Two stories: Kart and Dark Side | Onto the page](#)



johanna

July 28, 2015 at 4:07 pm | Reply

i think vampires and werewolve turning into normal humans re real because if dey re not thre cant have a name

Pingback: [Lastest Porphyria News](#)



Scarlet

July 31, 2015 at 3:26 am | Reply



You are all fools if you do not believe in these creatures! The only reason you don't want to believe in them is because you don't understand them!



Mo and Larry

January 26, 2016 at 4:32 am | Reply

?are they really real?🔪??at least I'm armed🔪?👁️???🔪??



Kathy

February 12, 2016 at 3:36 am | Reply

Well this has been very interesting...I do have Porphyria and it SUCKS..no pun intended. If anyone knows a doctor in MO that deals with this disease please let me know.my dermatologist isn't doing much and doesn't see the vampire markings as I do. I will check back. Thanks



Aparna. S

January 23, 2017 at 10:35 am | Reply

I find it interesting to read articles like this very nice.I also believe in werewolves and vampires. Humans may become like them at certain situations of life.




Jess

February 7, 2017 at 5:59 am | Reply



I have also heard of hunters wearing wolf skins to hunt wolves in so maybe that was the werewolf origin? Also if a family has a child with the disease that makes them grow hair everywhere they would likely hide it and only let him/her out at night and on full moons they can be more easily spotted? idk just a theory

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Oct 13, 2017

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