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Mad, Bad Scientists and Cute, Curious Magicians: The Quest for Knowledge in *Buffy* and the Whedonverse

"Science (is) an open-ended quest to improve our knowledge." (Chalmers 1999: 162)

"I'm just the science guy."

Topher Brink ("Needs," *Dollhouse*, 1.8)



(1) As readers of *Slayage* are well aware, academic publications discussing the works produced by Joss Whedon have been written by researchers from many different disciplines (Lavery 2004, Bradney 2006), but for perhaps obvious reasons there have been few contributions from natural scientists. Those that come to mind have usually been rather tangential to the actual text of Whedon's productions, and hence to other Whedon studies. What follows is a scientist's view of the view of scientists in *Buffy the Vampire Slayer* (the TV series; henceforth *Buffy*) and the Whedonverse.

(2) The presentation of scientists in popular culture matters because science is regarded very highly by society (Chalmers 1999). Despite the emphasis of many *Buffy* studies dealing with the show's portrayal of science, the realm of science is not only, or even primarily, the technology it may create. It is also a way of finding out what the world is really like, and in fact many people see scientists as something like "keepers of the truth." Yearly polls in my country (Sweden [\[1\]](#)) regularly show that people have much more faith in scientists and universities than in politicians, newspapers or the church. Scientists are evidently trusted to be objective in describing the world, or at least to try to be as objective as possible. This is presumably the reason why all sorts of claims made in commercials, by politicians, or in public discussions are backed up by science, or by allusions intended to give the impression of scientific investigation (Chalmers 1999, Jenkins 2004) .

(3) Moral questions are at the core of every Whedon production, and *Buffy* is not a show about vampires but rather about ethics (Stevenson 2003, Reiss 2004). Consequently the perceived morality of scientists in the Whedonverse also matters. Any close exploration of this matter will also sooner or later encounter the core question in philosophy of science: if and how science can be distinguished from other ways to search for knowledge.

(4) Joss Whedon has certainly been inspired by literary giants such as Dickens, Shakespeare and T.S. Eliot (Wilcox 2005) , but at least in his youth the bulk of his literary diet consisted of science fiction (SF) and comic books (Havens 2003) . Perhaps as a result of this upbringing, most of his productions belong in the realm of the fantastic rather than

the realistic. *Firefly* and the movie sequel *Serenity* are pure SF, as they are set in a distant future (Battis 2008). *Dr Horrible* and *Dollhouse* contain SF elements, especially in the form of futuristic technology, and this is also the case in *Buff*y and *Angel* (Aberdein 2003). The genre mixing in *Buff*y is often commented upon and described as a blend of horror, comedy, action and drama, but to this can be added that the fantastic elements of the show make up an unusual mixture of three usually quite distinct genres: SF, fantasy and horror. The reality of magic traditionally is the defining characteristic of fantasy, whereas scary beings such as vampires, ghosts, zombies, werewolves and the like belong in horror. However, for the purposes of this essay the important distinction is between SF on the one hand and fantasy and horror on the other. This is because it is only in SF that unusual phenomena are given scientific or quasi-scientific explanations. In fantasy and horror they are instead either explained by magic or they are simply parts of a supernatural realm that most people are (happily) unaware of.

(5) One of the important roles of SF is to comment on the positive and negative sides of scientific breakthroughs and new technology (Battis 2008). In this, the downsides (ethical considerations, the risks involved, dystopian societies) have arguably been emphasized more often than the upsides, in a tradition dating back to one of the very first clear SF novels: Mary Shelley's *Frankenstein*, published in 1818. Whedon's work is no exception to this critical take on science and its products. It should be noted that Dr. Frankenstein, who in Shelley's novel created the monster, is also an early example of a long line of "mad scientists" that later became something of a cliché in SF. Frankenstein has proved very durable as a model character; several episodes of *Buff*y (especially "Some Assembly Required," 2.2; "Goodbye, Iowa," 4.14; and "Primeval," 4.21) are clearly very directly influenced by this iconic "mad scientist" (Rose 2002). In the latest Whedon series *Dollhouse*, a key scene in the episode "Omega" (1.12)--where electricity strikes like lightning as Echo is re-programmed by the renegade "doll" Alpha--is visually reminiscent of the Hollywood version of *Frankenstein* (1931).

(6) The "mad scientist" is really a misnomer, in that these characters are generally not mad, and generally they are engineers rather than scientists (more on this below). At least for the purposes of the present discussion they could more appropriately be called "bad scientists," in analogy with the "bad girls" of Lorna Jowett's gender study of *Buff*y (2005). That is, they are bad not in the sense of being incompetent (they are surely not!) but in the sense of displaying morally questionable behavior. Adopting this term unfortunately means joining the tradition of fusing scientists with engineers but, as we shall see, more realistic natural scientists are not common in the Whedonverse, so a too strict definition of "scientist" is not useful.

(7) It is of some interest to tabulate the *Buff*y episodes where the main plot has an SF element to see if this is useful in analyzing how scientists are treated by the show (Table 1). Although this exercise necessarily has a subjective element, it is at least transparent and thus open to reanalysis. Note that the table has two columns for "value" [2]. The first is the moral value that is given by the show to the technology employed--"technology" in a wide sense, including drugs and software as well as machinery. This value is more or less equal to the moral value of the purpose to which this technology is applied, in agreement with the opinion of James B. South (2001) and Gregory Stevenson (2003) that in *Buff*y technology is only a tool--it is good when it is used for good purposes and vice versa (see also paragraphs 19-20). Thus a *Buff*yverse robot is for instance morally neutral *per se*, but the show argues that it is bad to create a robot girlfriend ("I Was Made to Love You," 5.15). Using technology to raise the dead could arguably be done for a good purpose, and there is some moral ambiguity when Chris raises his brother ("Some Assembly Required," 2.2). Adam, however, does the same thing for purposes presented as clearly morally bad ("Primeval," 4.21). The second entry is the moral value given by the show to the scientist behind the technology. This value is based on the totality of the character's words and actions exposed by the show, not just on the creation of the technology in question. Coach Marin is for instance not only a "bad scientist" but also a liar and a killer ("Go Fish," 2.20), and the same is certainly true of Warren.

Question marks denote clear intentional moral ambiguity, and in these cases the choice of "good" or "bad" as main value is by necessity rather arbitrary.

TABLE #1
MORAL VALUES OF TECHNOLOGY AND ITS CREATORS IN *BUFFY*

Ep. #	Plot with SF explanation	Technology	Value	Scientist	Value
1.11	Marcie becomes invisible	None	N/A	N/A	N/A
2.2	Darren raised from dead	Medical etc.	Bad?	Chris/Eric	Bad?/Bad
2.11	Joyce's date Ted is a robot	Robot	Bad	Ted's creator	Bad
2.20	Swim team becomes monsters	DNA modification	Bad	Coach Marin	Bad
3.4	Pete becomes a monster	Drug	Bad	Pete	Bad
3.12	Buffy loses her powers	Drug	Bad	Unknown	N/A
4.7	The Initiative's studies	Brain chips etc.	Bad?	Walsh et al	Bad?
4.14	Soldier modifications, Adam	Medical etc.	Bad	Walsh et al	Bad
4.21	Some dead are re-animated	Medical etc.	Bad	Adam	Bad
5.15	Robot girlfriend April	Robot	Bad	Warren	Bad
5.18	Spike gets a Buffybot	Robot	Bad	Warren	Bad
6.5	The Trio attacks Buffy 1	Time-lapse chip	Bad	Warren	Bad
6.11	Buffy becomes invisible	Invisibility ray	Bad	Warren	Bad
6.13	Katrina is "seduced" and is murdered	Compulsion ray	Bad	Warren	Bad

(8) Importantly, the entries in the two value columns are not automatically identical, because good characters can do bad things in *Buffy*. This is clear from Table 2, tabulating those episodes where the supernatural actions of one or several magicians are important for the main plot of the episode or season arc, excluding in particular many minor spells by Giles and Willow. To make the list as directly comparable as possible to the "bad scientists" of Table 1 it is restricted to magic actively performed by magicians in the show's present, which excludes e.g. the summoning of Eyghon by young Giles and his cohorts ("The Dark Age," 2.8) or effects of objects enchanted at some point in the show's distant backstory. It also excludes passive magic such as direct effects of a beast's demonic nature: the magic rod of demon Toth is included ("The Replacement," 5.3) but not the telepathy given to Buffy by a demonic infection in "Earshot" (3.18).

TABLE #2

MORAL VALUES OF ACTIVE MAGIC AND MAGICIANS IN *BUFFY*

Ep. #	Plot driven by magician	Magic	Value	Magician	Value
1.3	Cheerleaders under attack	Various spells	Bad	Catherine	Bad
1.6	Xander et al get hyena spirits	Possession spell	Bad	Zoo-keeper	Bad
2.5	Reptilian demon in frat house	Conjuring	Bad	Rich boys	Bad
2.6	Halloween becomes real	Magic costumes	Bad	Ethan Rayne	Bad
2.16	Xander wants a love spell	Love spell	Bad?	Amy	Bad
3.6	Adults behave like teens	Magic candy	Bad	Ethan Rayne	Bad
3.7	The glove of Mynegin	Conjuring	Bad	Gwen Post	Bad
3.9	An alternative world	Wish spell	Bad	Anyanka	Bad
3.11	Witch hunt	Glamour spell	Bad	Demon	Bad
3.13	Xander gangs up w/ zombies	Necromancing	Bad	Jack O'Toole	Bad
3.16	Vamp Willow returns	Time fold spell	Bad	Anya/Willow	Bad/Good
3.17	Angelus returns--or?	(Fake) spell	N/A	Shrouded man	Unknown
3.20	Hellhounds attack Prom	Conjuring	Bad	Tucker	Bad
3.22	The Mayor tries for Ascension	Demonic rituals	Bad	The Mayor	Bad
4.2	Buffy's roommate is bad	Soul sucking	Bad	Kathy	Bad
4.5	Beer makes you go caveman	Magic beer	Bad	Barman Jack	Bad?
4.9	Willow enforces her will	Wish spell	Bad?	Willow	Good
4.11	Demons open the Hellmouth	Demonic ritual	Bad	Demons	Bad
4.12	Giles becomes a demon	Spell	Bad	Ethan Rayne	Bad
4.17	Jonathan is a hero	Wish spell	Bad	Jonathan	Bad?

4.21	A super-Buffy is created	Enjoining spell	Good	Giles/Willow	Good
5.3	There are two Xanders	Magic rod	Bad	Demon Toth	Bad
5.5	The Key is hidden as Dawn	Spell	Good?	Monks	Good
5.5	Buffy finds out about Dawn	Magic trance	Good	Buffy	Good
5.6	Tara's family turns up	Demon-obscuring	Bad?	Tara	Good
5.8	Former cobra hunts the Key	Transmogrification	Bad	Glory	Bad
5.9	A Queller kills the mad	Demon summoning	Bad	Ben	Good?
5.11	A troll is released	(Botched-up) spell	N/A	Willow	Good
5.17	Joyce rises from the dead?	Resurrection spell	Bad	Dawn	Good
5.18	Buffy meets First Slayer	Guide ritual	Good	Giles	Good
5.19	Tara mind-sucked by Glory	Black magic attack	Bad?	Willow	Good
5.22	Glory opens the portal	Blood ritual	Bad	Glory	Bad
6.1	Buffy rises from the dead	Dark ritual	Good?	Willow	Good
6.5	The Trio attacks Buffy 2	Demon summoning	Bad	Andrew	Bad?
6.5	The Trio attacks Buffy 3	Time-loop spell	Bad	Jonathan	Bad?
6.6	Willow makes Tara forget	Memory spell	Bad	Willow	Good
6.7	Xander summons Sweet	Demon summoning	Bad	Xander	Good
6.8	Everybody forgets	Memory spell	Bad?	Willow	Good
6.9	Willow and Amy play	Spells	Bad	Willow/Amy	Good/Bad?
6.10	Willow is magic dependent	Magic trips etc	Bad	Willow	Good
6.13	Katrina is "seduced"	Glamours etc	Bad	The Trio	Bad

	and is murdered				
6.15	Everybody is stuck in house	Wish spell	Bad	Demon Halfrek	Bad
6.16	Xander's fake married future	Fake vision	Bad	Anyanka's victim	Bad?
6.20	Dark Willow's revenge	Black magic killing	Bad	Willow	Good?
6.21	Dark Willow's revenge	Black magic attacks	Bad	Willow	Good?
6.21	Scoobies defend themselves	White magic	Good	Anya/Giles	Good?/Good
6.22	Willow tries to end the world	Black magic	Bad	Willow	Good?
7.1	Dead rise at school	Talisman	Bad	Unknown	Bad
7.2	A giant worm attacks	Wish spell	Bad	Anya	Bad?
7.3	Willow is invisible to friends	Unintended spell	N/A	Willow	Good
7.4	Pupils summon demon Avilas	Demon summoning	Bad	Pupils	Bad
7.5	Anya summons killing demon	Demon summoning	Bad	Anya	Bad?
7.5	The killings are reversed	Wish spell	Good?	D'Hoffryn	Bad
7.9	Seal opens for Ubervamp	Blood ritual	Bad	Bringers	Bad
7.12	Dawn is not a Potential	Detection spell	Good	Willow	Good
7.13	Willow becomes Warren	Penance Malediction	Bad	Amy	Bad
7.14	Demon tries to reopen Seal	Blood ritual	Bad	Demon Lyssa	Bad
7.15	Willow opens portal for Buffy	Portal spell	Good	Willow	Good
7.20	A mute Bringer talks	Communication spell	Good	Dawn/Willow	Good/Good
7.22	All Potentials become Slayers	Scythe spell	Good	Willow	Good

(9) A comparison of Tables 1 and 2 shows that in *Buffy* futuristic/fantastic science is something performed by morally bad scientists, creating technology that is put to morally bad uses, whereas the presentation of magicians and their magic is more nuanced. Good magicians such as Giles and Willow perform much good magic (although it is only towards the end of the series that it becomes important for the plot; a criterion for inclusion was that the event should be mentioned even in the very brief episode summaries of Kaveney 2004). Moreover, good magicians sometimes do bad magic, and on occasion bad magicians can be persuaded to do good magic ("Selfless"; 7.5), but of course this comes at a cost. It is actually hard to give a main character with magical skills such as Anya even an ambiguous main moral value because of her convoluted development through the series. The same could arguably be said of Willow, but even when she almost destroys the world as Dark Willow viewers remain convinced that at the core she is a "good girl" (Jowett 2005: 56-61) and thus not really a bad magician. So, in *Buffy* scientists are always bad, but magicians are often good? As we shall see, this superficially obvious pattern may in fact be partly misleading.

(10) However, to get closer to the scientists, it is necessary to first cut through two outer layers that surround them and complicate the issue: the scientific process itself and the technology that it can be used to create. Madeleine M. Muntersbjorn (2003) and Andrew Aberdein (2003) both investigate the position of *Buffy* in the so-called "science wars." This was the debate that raged particularly strongly in the 90s, regarding the nature of knowledge and how it should be sought. Researchers in the natural sciences generally claim to approach knowledge of the "real" world which in some sense is objectively "true," whereas scholars in the humanities more often embrace subjectivity, a degree of relativism, and postmodern interpretations (Daspit 2003). In extreme versions of this latter philosophy, the truth is only in the eye of the beholder--there is no objective knowledge (Olson 2008).

(11) Muntersbjorn states that Whedon's television serials "celebrate the vitality of literature, history, and art" and notes his "commitment to the humanities" but regarding the "science wars" she still comes to the conclusion that *Buffy* is "a subversive challenge to arbitrary battle lines drawn in a needless debate" (2003, 91). In her reading, *Buffy* does not advocate either naive realism or naive relativism, but a pluralistic and pragmatic view of the world. Similarly, Aberdein (2003, 90) states that "room can be made for a pluralist conception of knowledge in which the richly humanistic can coexist with the crisply formal." Both authors note how in Season Four the scientific Initiative is clearly contrasted with *Buffy* (a creature out of myth) and the Scoobies ("her band of mystical outsiders," in Muntersbjorn's words). Nevertheless, Aberdein argues that "the latter happily exploit the methods of the former," and Muntersbjorn sees *Buffy* and her friends as in one sense better scientists than the Initiative's Maggie Walsh, because they are too busy saving the world to do anything but pragmatically accept the world as it is. Walsh instead sticks to her beliefs even in the face of new evidence--this is a non-scientific attitude. Thus both authors conclude that the apparent "anti-science attitude" (Aberdein's words) in *Buffy* is only superficial.

(12) Perhaps the science wars was not an entirely needless debate, as it did serve to clarify both similarities and differences between different fields of research. No doubt research in the humanities must often have a strongly subjective element. Different readings of a text are of course possible and sometimes one interpretation cannot be said to be better than the other, only different. Stevenson (2003, xiv) notes that this is true not the least because "many factors aside from authorial intent impact meaning." Most (but not all) would agree that there must however be a limit even to subjective interpretation; it must be consistent with the evidence, with the actual text. Stevenson (2003, 195-197) provides a graphic example: the moral watchdogs in "The Parents Television Council" said about Season Four of *Buffy* that it portrayed sex "almost exclusively as romantic or fun, with no reference made to the consequences of such behavior." Stevenson shows how this statement is not only blatantly subjective, it is plain

wrong.

(13) Knowledge in the natural sciences is certainly not given directly by objective observation of facts, either (Chalmers 1999) . Results of investigations must be interpreted in the light of existing theory. For instance, concepts like "atoms" or "genes" are not straightforward descriptions of entities that have an obvious real existence, they are (by now very well supported) theoretical models that stem from--but also govern--what we believe we are observing. The increasing awareness of this theory-dependence of science strongly influenced developments in philosophy of science over the last few decades, from Popper's falsificationism to Kuhn's paradigms and Lakatos' research programs, ending in Feyerabend's anarchistic denial that there are any standards for measuring progress in science, or even a scientific method that is distinct from other ways of seeking knowledge (Chalmers 1999) . Feyerabend (1975) thus saw science as not really substantially different from religion, and schools and parents should for this reason not uniquely favor science over, say, magic or myths when children are educated (Chapter 20) [\[3\]](#).

(14) There would not be much point to doing science if knowledge of the material world is only a matter of opinion, and few if any natural scientists actively involved in doing research would agree with such a statement or even with Feyerabend's claims (at least as they were initially interpreted). Alan Chalmers (1999, 162) observed that just because there is no universal, unchanging scientific method this does not mean that any method is equally good. It could be added that just because it is hard or impossible to formulate a sharp line of demarcation between science and other ways of seeking knowledge, this does not mean that they are all the same. At one extreme--religion--knowledge is given by authority, dogma, books and personal insights, and to believe without evidence--to show faith--is an ideal. At the other extreme, the ideal scientist is (perhaps unlike Maggie Walsh, and unlike many less than ideal real-life scientists) always willing to change opinion in the face of enough new convincing evidence, because this helps scientific progress.

(15) Both Aberdein and Muntersbjorn seem to see *Buffy's* mix of science and magic as being in agreement with Feyerabend's stance, advocating a pluralistic approach to knowledge-seeking rather than a special standing of science. More problematic from a scientist's perspective, however, is Richardson and Rabb's interpretation of science in *Buffy* (2007 ,16-17), since they note how the series "privileges ancient texts over the more sterile aspects of the high school curriculum" and "raises questions about whether the magico-mythico religious or the logo-ratio secular is better equipped to deal with evil." In their reading, an important part of the *Buffy* mythos is how it reflects "the Biblical story of the genesis of evil through partaking of the Tree of Knowledge" (2007, 17). In other words, reason and logic (at least when it is used to the exclusion of myth and magic) leads to evil. Such statements raise the question if scientists, relying as they do on reason, logic and rational interpretations, should feel that they are under attack from Joss Whedon's productions.

"I don't believe in science. All those bits and molecules no one's ever seen. I trust eyes and heart alone" Drusilla (*Buffy* "Crush," 5.14)

(16) Drusilla's extreme statement above can be seen as just part of her character. She is "so emotional as to exclude all reason" (Aberdein 2003, 85), and this is perhaps part of her "feminine" nature (Jowett 2005). And, after all, she is on the side of evil, so her views are not exactly endorsed by the show. More interesting from a rational philosophical perspective is the episode "Out of Mind, Out of Sight" (1.11), where the teenage girl Marcie becomes physically invisible because she is emotionally invisible: she is not seen by others. This is relevant here because the phenomenon is not given a magical but a quasi-scientific explanation. Giles says he made a mistake in looking for mystical causes when he should have investigated the quantum mechanical: "It's a rudimentary

concept that reality is shaped, even created, by our perception." This is cited approvingly by James Lawler (2003, 105-106) who goes on to say that "In the universe of *BtVS*, the structure and even the very existence of our world are determined by our basic choices."

(17) Another example of such near-absolute power of human choice is the episode "Normal Again" (6.17) where we are introduced to the truly scary possibility that the Buffyverse may not be real at all, but only a fantasy in Buffy Summers' psychotic mind. In the end, however, Buffy decides that the world of vampires and Scoobies is the one that she wants to inhabit, and we are left with a clear feeling that--by doing so--she actually makes this universe the real one (Richardson & Rabb 2007, 54-58). The writing in these episodes is brilliant as metaphor and for playing with the text and with our minds (see also Stevenson 2003, 28-30), but if applied literally to our own universe it would seem to take both relativism and existentialism more than a couple of steps too far. The near-mystical interpretation of quantum mechanics that Giles refers to as a "rudimentary concept," and which James Lawler calls "a contemporary validation" (106) of a thought experiment by Kant, was in fact wholly abandoned fifty years ago by scientists (Marin 2009). Juan Miguel Marin quotes Albert Einstein, who always firmly rejected the notion that the outer world is a derivative of consciousness: "No physicist believes that. Otherwise he wouldn't be a physicist....Why should anybody go to the trouble of gazing at the stars if he did not believe that the stars were really there?"

(18) But given the theory-dependence of observations, it is appropriate to ask what science's answer to Drusilla really is. How do we know that the phenomena described by science have any objective existence, that stars, atoms and genes--or something similar enough to our theoretical models to make such concepts useful--exist whether we believe in them or not, and that they existed before we knew about them? There are two standard lines of argument. First, the experimental method in science ensures a degree of objectivity and scientific progress. Experiments can be repeated by someone else, with the same result, and well-designed experiments can convince even a researcher who is initially skeptical. This is not true of religion or of (real-world) magic. Second, to the extent that scientific results are used to construct technology, the fact that this technology actually works demonstrates that the scientific results cannot have been entirely subjective--instead our theoretical models must at least approximately correspond to something real (see also Dunbar 1995, 85-87, and Chalmers 1999, chapter 15). Whatever our opinion on the desirability of nuclear bombs or gene therapy, such technology works and those developments did not result from magic or religion, but from science.

(19) In this sense, any use of technology in the Whedonverse is pro-science, regardless of how it is presented. It has been observed by e.g. South (2001) and Stevenson (2003) that in *Buffy* the Scoobies (sometimes with the exception of bookish Giles) do not seem to have anything against making use of technology--such as computers, or even rocket launchers--when fighting evil. Even weapons are "good" when used for good purposes. Nevertheless, the main pattern of values attached to technology in *Buffy* is different, if we focus on those episodes where the main plot has an important SF element (Table 1). Invariably, the "fantastic" technology is used for bad purposes. James B. South (2001) has astutely remarked that "there is present in *Buffy the Vampire Slayer* a real worry about the uses of technology and the ways in which it can dehumanize humans" (98).

(20) South can say this because he interprets *Buffy's* fantasy world as a metaphor for our technological society, but the later Whedon shows deliver the same warnings more directly. In *Firefly*, the catalytic incident that starts off the plot of the series is the arrival of River Tam, whose brain has been programmed using future technology to create a superior type of agent [4]. The other main plot point (which happened in the backstory, but is not revealed until the movie *Serenity*) is the experiment of pacifying the inhabitants of the planet Miranda. This experiment backfired, killed many, and created the obviously dehumanized Reavers out of the rest. Similarly, *Dollhouse* revolves entirely around the concept of futuristic brain programming technology and what it does to the humans for hire as "dolls" and to a society that would permit such techniques [5]. The true world-

threatening scope of this danger is revealed in the episode "Epitaph One" (*Dollhouse* 1.13 [6]). So we can safely conclude that--when it drives the plot and is not just an everyday tool--technology in the Whedonverse is most often presented as something morally bad or at least very problematic.

(21) There are at least three (not mutually exclusive) possible explanations. First, it may be a consequence of Whedon's self-declared feminism, if science and logic is seen as essentially masculine and magic and instinct/emotion as feminine, as Jowett suggests (2005). In support of this notion, although one of the primary morally bad scientists in *Buffy*, Maggie Walsh, is a female (in line with the show's general gender deconstruction) most of the ones found in the Whedonverse are male, and their victims are often female. Second, the gloomy picture of technology, and by extension of science, may be part of the show's message that we need myth as well as (or even instead of) logic (Aberdein 2003; Stevenson 2003, 25; Richardson & Rabb 2007). Third, the possibility should not be underestimated that Whedon's SF upbringing may not only have influenced his view of science (given the genre's often dark messages) but, furthermore, may lead him to naturally turn to plots based on science or technology, even when the main message of the story is really about something else.

(22) The SF episodes centered on the robots Ted ("Ted," 2.11), April ("I Was Made to Love You," 5.15) and the Buffybot ("Intervention," 5.18) are comments on human relationships, rather than on robot technology or on morally bad scientists. Similarly, in the episode "Beauty and the Beasts" (3.4) the character Pete turns into a super-macho monster--at first by using a drug that he has developed himself. This makes him a bad scientist, but the point of the story is clearly not the misuse of biochemical knowledge, but to use a Dr-Jekyll-and-Mr-Hyde plot as a metaphor for male violence. Good drama demands perils and obstacles for the protagonists, so if the antagonists are scientists, the focus will naturally be on the negative consequences of their technology. The same goes for antagonist magicians, and a comparison between Table 1 and Table 2 shows that particularly in the early seasons the problem of the week to be solved by the Scoobies was caused by either bad scientists *or* bad magicians, taking turns.

(23) In *Buffy* (and *Angel*) it's typically almost accidental whether the dead are raised by science ("Some Assembly Required," 2.2; "Primeval," 4.21) or by magic ("The Zeppo," 3.13; "Forever," 5.17; "Bargaining," 6.1; "Selfless," 7.5), or whether the dream girl turns out to be a creature out of horror ("Teacher's Pet," 1.4; "Bewitched, Bothered, and Bewildered," 2.16) or a technological robot ("I Was Made to Love You," 5.15; "Intervention," 5.18). Invisibility can be explained scientifically ("Out of Mind, Out of Sight," 1.11; "Gone," 6.11) or magically ("Same Time, Same Place," 7.3). SF, horror and fantasy plots are interchangeable; the point is not the means, but (because this is a show with strong morals) the intentions. In "Life Serial" (6.5), the Trio attacks Buffy first with futuristic technology, then with demons and finally with a spell, as each nerd is drawing on his particular strengths, but they all have the same immoral goal. Likewise, Warren's cerebral dampener in "Dead Things" (6.13) is mainly a technological feat of brilliant engineering, but it is charged by demonic energy. Only Season Four's treatment of the Initiative, and possibly "I, Robot...You Jane" (1.8; see Stevenson 2003, 126-28), stand out as critiques of the dangers of science and technology *per se*.

(24) As mentioned above, in the later Whedon productions (*Firefly*, *Serenity*, *Dollhouse*) this critique is more obvious. However, also in these cases it is the morality of how technology is used by humans that is the focus, not really technology *per se*. To cite Jes Battis (2008, 36) : "All SF is concerned primarily with human interaction--what we do in space, and how we use technology. This is what makes SF as a genre so focused on ethical development." Whedon makes full use of the power of SF's "What if...?" questions, which can be used to investigate new moral choices and to sharpen the edges of old dilemmas, whether about technology or something else. Richardson & Rabb (2007) suggest that Whedon intentionally does not provide absolute answers to such moral dilemmas, because the message is not that there is a right and a wrong answer, but that we have the free will to make an existential choice. We can take a stand or we can refuse to take a

stand, but in any case we must live with the consequences of that choice.

(25) In the search for the good scientist in the Whedonverse we must now deal with the issue of technology as something distinct from science and scientists. A fact that is for convenience often ignored by both the authors of *Buffy* and by scholars commenting on the show is that--in the real world--science is a social endeavor, and any piece of technology is the result of a communal process that often takes many years. Curiosity-driven basic research, with the aim of finding out more about the properties of the physical, chemical and biological world, leads to scientific publications and presentations at meetings. If something novel has been found, corroborated with enough evidence, other scientists perform additional investigations based on the new ideas, and over time the consensus in the field of research may change to accommodate them. Sometimes the new knowledge has implications for goal-oriented, "applied," research and further investigations may then attract funding from more strategic resources, perhaps also from private companies that see a commercial potential. Even at this point much further research may be necessary before there is a finished product, but this is carried out by engineers rather than by scientists.

(26) The mad scientists of the SF genre and the morally bad scientists of *Buffy* sidestep this entire process. They are scientists and engineers rolled up into a single antagonist, and often they do everything from coming up with the first theory to finalizing the finished product. And this is not just any product, but often technology which seems to be decades ahead of the competitors. *Buffy* is full of such quite unrealistic bad scientists (see Table 1): high school students and swim-team coaches who single-handedly perform technological miracles on a shoestring budget. Unfortunately, this self-reliance tends to put them on the morally bad side in terms of *Buffy's* ethics, which favor friendship and group efforts (Reiss 2004). There are of course good reasons for this simplification, since a realistic collective scientific process from idea to implementation would not make for very exciting TV. Furthermore, it is clearly the practical applications of scientific knowledge--the realm of engineers--that make the natural sciences more potentially threatening to society and thus more useful as pivotal plot devices in an action show than research in the arts and humanities.

(27) Professor Maggie Walsh (the "evil bitchmonster of death" in *Buffy* Season Four) gives classes in psychology which count against the required science credits ("The Freshman," 4.1), and apparently her expertise lies on the biological side of this cross-disciplinary area of research, since she is proficient in applied behavior modification. It is the fact that she is thus in a position to put her theories into working practice that qualifies her as a bad scientist. Conversely, Winifred Burkle (Fred) in *Angel* is scientifically schooled in physics, but she is a more timid character than Walsh, not to mention that she is on the side of good. She is thus non-threatening, but this is also because she mostly stays away from practical applications of science, unlike her colleagues: the well-meaning but dangerously naive Gene Rainy of "Happy Anniversary" (*Angel*, 2.13) and the bad scientist Professor Seidel of "Supersymmetry" (*Angel*, 4.5). Good Fred is a curiosity-driven theoretical scientist who publishes on the esoteric subject of string theory, but somewhat unrealistically she still becomes head of Wolfram & Hart's evil applied Science Division. The interesting potential for having her make complex moral decisions in this position is never really utilized before her body is permanently possessed by the demon Illyria.

(28) Of the natural sciences, geology is further from practical technology than physics, chemistry or biology, and perhaps it is of some relevance that the geologist Lester Worth is one of the rare scientists who are not presented negatively in *Buffy* ("Graduation Day," 3.21). After a brief appearance he is killed by Faith, who is at the time on the side of evil, for the only crime of being curious about a find that he thinks may be a dinosaur fossil. This parallels the fate of another "safe" researcher, archeologist Doug Perren ("Becoming," 2.21), who is curator in charge of a newly found artifact (containing the demon Acatlha). This gets him killed by evil Drusilla.

(29) As mentioned above, the two key plot points of *Firefly/Serenity* hinge on the

misuse of science and technology. However, the responsible scientists and engineers are not shown at all, so we know nothing of their ethics beyond obeying the Alliance; we don't even know if they were aware of the practical applications of their work. Instead, those events are used to display the moral decisions of in particular Captain Malcolm Reynolds (Goodfriend 2007, Kurzban 2007, Richardson and Rabb 2007) .

(30) In *Buffy* (Table 1), almost all scientists are morally bad scientists/engineers, and they are either quickly killed off or they stay bad. This is the same fate that meets the bad girls of the show (Jowett 2005). Lorna Jowett points out that moral realignment and redemption of bad girls is only possible for the more developed main characters, such as Faith. Two of *Buffy's* bad scientists do recur in several episodes, Professor Maggie Walsh and Warren, but they are still not main characters and neither of them shows any moral development. Walsh appeals to the greater good of the Initiative's purpose to clear the world of dangerous beings, but as an individual she is presented as bad, or even evil (for one thing, she is willing to set up *Buffy* to be killed; "The I in Team," 4.13), and she is killed off relatively quickly by her own creation Adam, with no time for remorse and re-thinking.

(31) Warren is consistently shown as making bad choices in terms of *Buffy's* core morals, i.e. he is "self-centered with no regards for others" (Stevenson 2003,166). By virtue of his long run as a bad scientist on the show he finally receives the doubtful honor of being killed by no other than the once so good and innocent Willow. At least when it comes to killing humans, *Buffy* always tries to avoid "the demonizing of those whom the hero kills," a common device to preserve viewer sympathy for the protagonist (Wilcox 2002) . The death of Warren by Willow's magic is not taken lightly, but scientist (of sorts) Warren comes closer to being demonized than just about any human in the series. No tears are shed over him, and Willow's act of murder plays a relatively small role in her season seven redemption, given the show's usual ethics [\[7\]](#).

(32) At the time of writing, two new Whedon series are still unfolding [\[8\]](#). The Internet-and DVD-based *Dr. Horrible* refreshingly has a morally complex bad scientist as the protagonist, opposed by the egotistical hero Dr. Hammer. Thus, "the bad guy with good intentions is matched by the good guy with bad intentions" (Wilcox 2009). Time will tell whether Dr. Horrible can reconcile his strivings for fame and to belong in a community (unfortunately he targets the Evil League of Evil) with his basically nice and loving personality. In *Dollhouse*, bad scientist Topher Brink is initially painted as completely amoral, but as a main character he soon shows more layers. Unless the show is cancelled too early, there may be some hope of redemption for him. Hopefully Topher does not really believe his own protest that he is "only the science guy" and thus innocent ("Needs," 1.8), because clearly no scientist/engineer working so close to the applied technology or finished product can be free of the responsibility for making the moral choice to go along with the application or not. This is equally true whether the choice concerns working in the tobacco or weapons industry, or programming humans to be dolls. Richardson & Rabb rightly remark that the Initiative in *Buffy* could be read as a warning for universities against accepting applied funding. Such money never comes without ethical strings attached, which might compromise scientific integrity and objectivity.

(33) Even when applications are more distant, there are ethical considerations in science that can be critically explored by a TV show, for instance concerning the subject of the study. Knowledge-seeking in the safe, text-based traditions of the humanities is presented positively in *Buffy*; the Scoobies hit the books (or computers) in almost every episode in order to fight the good fight. In the natural sciences experimental manipulation of the physical world is instead considered the strongest method, which can lead to ethical considerations even during initial curiosity-driven investigations.

"Psychologically, this is fascinating. Doesn't it make everyone want to lock them in separaterooms and do experiments on them?" Riley ("The Replacement," 5.3)

(34) The experiments on River Tam and the population of Miranda in *Firefly/Serenity* are unethical not only because they threaten to dehumanize, but also because they were done without the consent of the study subjects. In *Buff*y, Coach Marin ("Go Fish," 2.20) is guilty of the same unethical behavior, besides his other faults. The swim team did not consent to taking the risk of becoming monsters. Neither did Buffy herself consent to risking her life in "Helpless" (3.12), when the Watcher's Council orders Giles to remove her powers with a drug. This is done solely as a test designed to gain marginal added knowledge about Buffy's abilities, and would never have passed scrutiny by a science ethics board. Even more gruesomely, the fact that Professor Walsh has created something evil in Adam truly becomes clear at the point when we understand that he has killed and dissected a human boy to fulfill his need for knowledge ("Goodbye, Iowa," 4.14; Breton and McMaster 2001; Wandless 2001; Daspit 2003). That this is out of bounds for a scientist is obvious to everybody except perhaps the likes of Dr Josef Mengele.

(35) More difficult ethical problems instead deal with the limits of (physically) non-invasive studies on humans, or experimentation on other living beings: animals, or--in the Buffyverse--soulless demons (Season Four, Breton and McMaster 2001 Wandless 2001). The quest for knowledge has its moral limits. A more complex presentation of a scientist and a scientist's ethical dilemmas is given in the form of Dr. Stanley Backer in "Killed by Death" (2018). He is a medical doctor who is performing clinical studies, and as such he is one of the most realistically portrayed scientists in *Buff*y. At first, the Scoobies suspect him of doing experiments that are killing children at the hospital, but it turns out he really had good intentions; he was trying to help the sick children. However, the fact that he had earlier been reprimanded for controversial experiments and risky procedures suggests that his studies may have been borderline unethical.

(36) This more or less exhausts the list of scientists in *Buff*y. As we have seen, most of them are used as simple villains and plot-enablers (Table 1). Like the (invisible) scientists of *Firefly/Serenity*, they create opportunities for others to make the right moral decisions, but there is no room for their own existential decisions beyond their initial bad choices--they have no path to redemption. Paraphrasing Jowett (2005, 94, originally on the subject of bad girls): the static nature and restricted development of the bad scientists trap them in their role as villains. They are the kind of opponents that Buffy longs for in season four "Pangs" (4.8) when she is torn between cultural guilt and a desire to protect her contemporaries from spirit Chumash Indians: she prefers her evil to be "straight up, black hat, tied to the train tracks, soon my electro-ray will destroy Metropolis bad." However, we should not yet be content with the cartoonish bad scientists shown in *Buff*y, but instead explore the possibility that the division between science and magic is really moot in the Buffyverse, so that Tables 1 and 2 can be fused. It follows that perhaps cute, curious witch Willow, who by virtue of being a main character and a protagonist can follow a more intricate moral path, could be the more multi-dimensional scientist in *Buff*y [\[9\]](#).

"Gotta keep asking the big old questions, when you're blessed with this girl's thirst for knowledge!" Willow ("Revelations," 3.7)

(37) Several *Buff*y scholars have emphasized the contrast between science on the one hand and magic on the other. Science is masculine (Jowett 2005), secular and dryly logical (Richardson and Rabb 2007), and it can create dangerous, dehumanizing technology (South 2001, Stevenson 2003). Magic is feminine (Jowett) and mythological (Richardson and Rabb, Stevenson), and South (2001) adds that it is rooted in tradition and books, somehow intrinsic to the magician, and can lead to liberation from the dangers of technology. At the same time, as noted above, South sees much of the supernatural in *Buff*y as metaphors for such technology, in itself indicating that the borderline between

science and magic in the show may not be very sharp. This is also pointed out in the treatments of Aberdein and Muntersbjorn.

(38) Aberdein (2003) distinguishes between three grades of popular representation of the supernatural. In grade one it is reduced to the natural, to contemporary science, the way episodes typically ended in the original cartoon show *Scooby-Doo*--no matter how many ghosts and goblins that had passed by. In grade two it is reduced to futuristic technology and quasi-scientific explanations--the typical SF device for explaining the fantastic. In grade three the supernatural is irreducible; it is truly magic. Aberdein mentions that the distinction between grades two and three may not be real, and quotes Feyerabend's rejection of "the conventional exclusion of magic from scientific technique" (89).

(39) "Guys! Reality?" an irritated Buffy says to Xander and Oz in "Helpless" (3.12) when they bicker about Superman and how exactly he is affected by different sorts of kryptonite, when they should really be researching what magic has taken Buffy's powers (it was actually a quasi-scientific drug). Magic is Buffy's reality. Superman is her fiction.

(40) In the *real* world, magic is very different from science; it is not by chance that modern engineering, molecular biology or medicine is not performed by magicians. In the Buffyverse the situation is quite different. As Muntersbjorn (2003) points out, the Scoobies make pragmatic use of magic (as well as technology). The very reason they can do this is because the fantasy element of *Buffy* demands that magic follows strict rules; it *does* work in a repeatable (if at times somewhat unpredictable) and objective manner. It is thus part of true and rational knowledge about the world, and so the dichotomy between science and magic starts to break down. As noted by Aberdein (2003, 88) scientists were historically interested in astrology, alchemy and magic. These areas of research were initially well worth pursuing, but they were abandoned by professional scientists because they failed to produce useful results; in the terminology of Imre Lakatos (1970) they declined as research programs. In the Buffyverse, it is instead something of a mystery why magic is mostly found in old books and is not studied methodologically and experimentally by scientists to produce new knowledge, since it is such a powerful technology. Willow's magic has the potential to save or destroy the world, just like science. It is no less formidable or risky than nuclear technology.

(41) Willow is a knowledge-seeker from the very beginning of *Buffy* and she is firmly on the road to a future career as scientist or engineer when her interests turn more and more to magic [\[10\]](#). Willow herself doesn't seem to see an important distinction. As she says in "Bad Girls" (3.14): "Chemistry is easy. It's a lot like witchcraft, only less newt." She is also on record as saying that magic works off physics ("Get it Done," 7.15), and even provides an example: she speculates that a spell that can make the mute talk works by "transmuting synapses to sound waves" ("Touched," 7.20). Willow discovers magic already in Season Two and soon becomes the show's most multifaceted knowledge-seeker, albeit with the makings of a bad scientist. In "Becoming" (2.21), Buffy notes Willow's somewhat morbid interest in dead Jenny Calendar's files. Willow's curiosity about magic is thus signaled as threatening from the beginning, and in Jowett's reading Willow pursues even feminine witchcraft in a masculine way, in a close parallel to Warren, the recurring bad scientist of the show. Willow saves pieces of the killer robot in "Ted" (2.11) for future reference and later she shows engineering skills matching Warren's when she repairs and modifies his creation, the Buffybot ("Bargaining," 6.1).

(42) Willow arguably also provides a further direct parallel to Dr. Frankenstein, in that she raises Buffy from the dead, even if she uses dark magic rather than science ("Bargaining," 6.1). In line with Richardson & Rabb's existential reading of *Buffy*, it is never clearly spelled out whether this was a good or bad thing to do, all things considered. It is referred to as "wrong" (6.1) and Giles condemns the act ("Flooded," 6.4) but after all it resulted in Buffy being around to save the world again ("Chosen," 7.22). There are ethically good and bad choices, but no moral rules can be written in stone.

(43) Willow raises Buffy out of love, but this is not so different from Chris in "Some

Assembly Required" (2.02). She also has selfish reasons (Stevenson 2003, 241; Bardi and Hamby 2007) . There is furthermore a distinct feeling--although not articulated--that she performs the resurrection spell at least partly just to see if she can really do it, a bit like Eric, Chris' bad scientist buddy. Willow craves power, and at this stage Willow sees such powerful magic as something cool. She soon becomes addicted to its lures, and towards the end of the same season, Dark Willow kills for vengeance and is then finally ready to destroy the world--out of good intentions, of course. She backs off because of Xander's unconditional love, and can be granted redemption in the final season. Willow is a good or at least multi-dimensional person, shown through seven seasons as she is trying to maneuver the existential difficulties of life and come to grips with her insecurities (Battis 2003) . I like her; can I consider her a scientist colleague of mine? Perhaps, even without resorting to agreeing with Feyerabend's original anarchistic theory of science.

(44) The characteristics of magic in *Buffy* that South (2001) points to--as distinct from science and technology--is that the facility with magic is intrinsic to the person, natural rather than acquired, and that it is given by tradition and books. The evidence that the propensity for Buffyverse magic is inherited is however scant or even non-existent when it comes to humans--and not counting the demonic fighting/healing powers of the Slayers. Tanya Krzywinska (2002) writes that witch Amy "has inherited her mother's powers," but also that presumably she "gleaned her spells" from her mother (187). Thus her powers may be acquired. If magic is intrinsic, it is a very widespread skill. Just about every main character does active magic (and many minor ones as well: Table 2). Besides Willow and the other more accomplished magicians--Giles, Amy, Tara, Anya, Andrew and Jonathan--magic is performed by Angel (e.g., "Becoming," 2.22), Buffy ("No Place Like Home," 5.5) and Dawn ("Forever," 5.17). In the hilarious episode "Something Blue" (4.9), the newly engaged Buffy and Spike are cooking up a spell to reverse Giles' blindness. They are not consulting Willow, even though they are unaware that she is behind the whole mess. Willow herself is clearly no Harry Potter, born to magic. She has a strong talent for it, yes, but arguably she is just a highly intelligent and curious person that would succeed with anything intellectual that she set her mind upon. That she initially learns her magic from books only strengthens this argument.

(45) *Buffy* seems to value such knowledge from books and by extension from tradition and mythology, something which is often commented upon positively (e.g., South 2001; Richardson and Rabb 2007). I do not wish to dispute the value of such sources of knowledge. Tradition is not always a good thing, however, as exemplified by the above-mentioned episode "Helpless" (3.12), where the Watcher's Council's poor excuse for risking Buffy's life in a pointless test is that "it's been done this way for a dozen centuries." From the perspective that *Buffy* magic can be viewed as something worthy of being the object of science--because it works, it can be applied--the fact that it is rooted in books also takes on a less positive meaning. For a science it is a dead end to assume that all important knowledge can be found in books, traditions and myths. Why then bother too much with first-hand observation and experiments?

(46) Talented scientist Willow eventually breaks out of the confinement of knowledge derived only from books. Naturally she takes her first steps by learning from ancient texts and from authoritative instructors (especially Giles), but this is just like a student of science learning introductory biology, chemistry and physics from text books and teachers. Willow is never content with safely following magic recipes but always experiments a bit ahead of her current state of knowledge. In "Out of My Mind" (5.4) she improves on a light spell:

Tara: How'd you do that? With the light?

Willow: You know. You taught me.

Tara: I taught you teeny Tinkerbell light.

Willow: Oh yeah, I tinkered with the Tinkerbell. It was easy.

(47) By the seventh season Willow is well beyond the stage of passive learning from her predecessors: she is finding new knowledge. Willow improvises a spell to bring Buffy back from meeting the original creators of the Slayers ("Get it Done," 7.15) and in the final episode she (following a suggestion from Buffy) comes up with the spell that uses the magic of the Scythe to transform the potentials into Slayers ("Chosen," 7.22). This has never been done before, so she could not have learned it from a book.

(48) Interestingly, in *Buffy* Season Eight--the Whedon-produced comic book sequel--this development has gone even further, and Willow is now a very powerful witch with little use for books; she could write her own. The fusion of science with magic has also continued, and magic itself is approaching a grade two, quasi-scientific explanation. Willow does magic battle with Amy, but says she is only pretending: "You think I'm fighting you. I'm just absorbing your mojo. So I can decode it." Later in the same issue (Volume 1, #3) she says that Amy's spells "reeked of tech." In the next issue (also written by Whedon) Xander says that "teleportation is not an exact magic." These references to computer terminology, science and technology provide further evidence that the polarity between science and magic is to some extent a false dichotomy--within Whedon's fictional Buffyverse, that is!

(49) *Buffy* magic is not easily recognizable as a science, because modern society sees real science as something scientists do. It is the activity of people with PhDs and jobs at the university or other professional research positions. When I teach philosophy of science for biology PhD students, each year I put the question to the class: are you a scientist? Students in their first year of PhD studies always say "No, not yet"; those approaching their dissertation often say "Yes." The latter category of students typically have published one or two scientific papers, they have presented their work at meetings and they may have acted as peer reviewers--they have started to see senior scientists as colleagues and hence themselves as scientists. This fits very well with Ziman's social definition of science (1968) : that science is the search for consensus of rational opinion among all competent researchers. Science is an extension of rhetoric; it is a social activity where the theories that best survive severe tests and critical discussion are the ones that are allowed to most strongly influence the consensus. As pointed out by Alan Cromer (1995) , we can thus also define science as "the study of those things about which the scientific public can form a consensus." Consequently, if a branch of academic activities insist that there can be no consensus even in principle, i.e., if it wholly embraces subjectivism and relativism, then the activity is not strictly a science according to this view [\[11\]](#).

(50) This social context is what is lacking for Willow and the other Buffyverse magicians, before we can easily see them as proper scientists. It would certainly be possible in principle to form a consensus about the workings of the pragmatic and repeatable *Buffy* magic, but (similar to the situation for real-world astrology, a thriving activity which is not considered a science) there is little evidence of discussion among peers with a serious aim to arrive at objective knowledge--certainly no peer-reviewed journals or international meetings where magicians try to convince each other that they are on the right track. Knowledge is instead found in dusty old books, perhaps produced in a golden era when enough people believed in magic so that they could form a social network where scientific progress was possible. Magic in *Buffy* is like an ancient research program that has decayed. But Willow's recent activities suggest that it could get going again--just give her a chance!

(51) Is science really under assault from Joss Whedon's productions? Perhaps not, if it is true that the contrast between science and magic in *Buffy* has been overemphasized. Since *Buffy* is a strongly moral show, when something negative happens to the protagonists this is often also something morally bad. The purpose is often not to paint

science (or magic!) as bad in itself, but to kick off a moral plot. The bad scientists are just in it for the ride. But perhaps yes, to the extent that Richardson & Rabb's analysis holds and *Buffy* really teaches that reason and logic leads to evil. Certainly, season four (and later Whedon shows) is a pointed critique of at least some aspects of science. In a plea for postmodern modes of knowledge and education, Toby Daspit (2003) suggests that the Initiative's goals echo "modernism's faith in the ability of science and reason to remedy all ills" (121) and that "the will to mastery intrinsic in modern scientific inquiry is itself dangerous" (122). Another recent example in the same vein is Wendy Olson's (2008, 10) description of this season of *Buffy* as a comment on the "monstrosity of scientific rationality."

(52) Most would still agree that we need science, if only because we want innovations such as clean and safe energy sources, or treatments for diseases. We may not be able to remedy all ills, but this does not mean that we should stop trying. At the same time, students are increasingly choosing other subjects, in Sweden and many other countries. Also, science may be held in high esteem in society, but appeals to scientific evidence are frequently misused, and we need people to understand the strengths and limitations of science in order to be able to better judge such claims for themselves (Jenkins 2004). Thus it could be problematic if scientists in popular culture are too often cast as villains, and if science is shown as inherently evil. Neither should scientists be displayed as heroes of the society that can do no wrong. A quote from Robin Dunbar (1995, 180) is relevant: "Popular accounts of science must move away from the magical 'hero-quest' and 'gee-whiz' varieties to a more realistic attitude in which science is reported as it really is....This is a role that television is especially suited to play because of the immediacy of its impact." Dunbar is here referring to popular science rather than to TV drama, where realistic accounts of science often are not feasible, but his point--that it is desirable to move in this direction if we want an informed public--is still valid.

(53) *Buffy* and *Angel* are the least realistic of Whedon's productions, and many of us respond strongly and viscerally to their fantasy elements. Scientists or not, we rejoice when magic finally defeats science in "Primeval" (4.21), in "a challenge to reason and the will to knowledge" (Olson 2008, 14). One might ask what it is about magic that is so enticing, and in what sense magic is "liberating" (South 2001, 99). One obvious answer is that the Fantasy genre "offers an escape from the banality of everyday life" (Krzywinska 2002, 179). Also, magic in the Buffyverse stands for power (Stevenson 2003), and it is always liberating to see power used for good purposes--especially when this is accompanied by exciting special effects.

(54) A more complex possible answer is that what South describes as the liberating aspect of magic in *Buffy* could be that (good) magic is used to show the virtue of hope against all hope, of defying rational and utilitarian choices [\[12\]](#). According to Richardson & Rabb, true freedom to choose means to not have to choose the lesser of two evils, or the greater good--with some evil consequences attached. Evil should not be let into the equation at all. The authors of *Buffy* take care not to make magic an easy way out, both because of the show's focus on the consequences of choices and actions, and presumably to avoid the suspense-killing *deus ex machina*. Nevertheless, the presence of magic means that the heroes of *Buffy* and *Angel* can sometimes refuse to choose between evils and that they can repeatedly go up against impossible odds and prevail.

(55) In Season Two ("Becoming," 2.22) Buffy chooses to kill her beloved Angel, for the greater good. It turns out that magic later brings him back from his hell dimension, although it is never made entirely clear how. At the end of Season Five, Buffy again faces a similar choice: between saving the world and saving her sister Dawn ("The Gift," 5.22). This time she (according to Richardson & Rabb) refuses to choose rationally and instead sacrifices herself--the hidden third option. Because of her magic resurrection by Willow, she still lives to fight another day. Could this be the true liberating aspect of Buffyverse magic? It allows our heroes to sometimes cheat reality, to eat the cake and have it, too. The real world is not so forgiving, and thus a bleaker place to live in. Perhaps this is part of the reason why later Whedon TV productions (sadly) lack magic: by eliminating the

backdoor of supernatural solutions the moral choices in *Firefly* or *Dollhouse* potentially become more immediate and more urgent. The dead stay dead, and sometimes impossible choices must indeed be made (Held 2003).

(56) A world where all decisions are taken strictly logically and rationally is nothing to strive for; emotion and intuition must also play a role. Such gut-feelings help us decide wisely, because they summarize more complex ethical considerations than those that can easily be laid down in the form of rational laws and rules. However, the opposite is also true, as illustrated by "Gingerbread" (3.11) with the rampant irrationality of its witch hunt [13]. As history has shown more than once, there is reason to fear a world where major decisions are taken based on their emotional charge, and where society scorns scientific knowledge and rejects even the mere attempt at finding out the objective truth of a matter.

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[1] [Mediakademien](http://www.mediakademien.se/sv/Arkiv/Fortroendebarmetern/), <http://www.mediakademien.se/sv/Arkiv/Fortroendebarmetern/> (in Swedish)

[2] The values are my own interpretations, but tempered by academic discussion and other commentaries. Space does not allow me to defend each value in detail, but in most cases they should be relatively obvious.

[3] Feyerabend later moderated his views, explained that he rejected relativism as much as simplistic rationalism, and clarified that he sometimes wrote ironically and that the anarchistic principle "anything goes" (end of his chapter one) should rather be seen as "the terrified exclamation of a rationalist who takes a closer look at history" (Preface to 1993 edition).

[4] See Daniels (2007) and Connor (2007) for comments about the science involved.

[5] Ed Connor's discussion of neuroscience in *Firefly and Serenity* (2007) is very relevant also to *Dollhouse*.

[6] I refer to this episode as 1.13--as is commonly done--even though only twelve episodes originally aired in the US. It was however broadcasted as episode 13 of the first season in Sweden, Sunday, July 26, 2009, and later in other countries.

[7] In "Selfless" (7.5) the deed is briefly alluded to, and Willow mentions that it is

always on her mind. However, in "The Killer In Me" (7.13) a spell cast by Amy makes Willow unconsciously choose her own punishment; she then turns into Warren, but her own interpretation is that this is punishment for kissing Kennedy and moving along from Tara (who was accidentally killed by Warren). Warren returns skinless but alive (and no more likeable) in the comic book sequel season eight, so Willow may still have to further face her actions.

[8] There are also several comic book sequels. A web and DVD sequel to *Dr. Horrible* is not yet in production as I write (so it's not technically a series), but there are concrete plans.

[9] South (2003) describes Willow as a character "outside the scope of rationality". However, in her knowledge-seeking she seems as rational (or irrational) as any scientist.

[10] Jowett (2005) and others make much of this shift from masculine to feminine activities, but Aberdeen (2003, 90) warns against too simplistic gender interpretations of "ways of knowing".

[11] I'm not saying that the only way to fail to reach a consensus is if a discipline is founded on subjectivism and relativism. There is little complete consensus about anything in my own research field of evolutionary ecology, for instance, because it's too complex and too contingent on history to be an exact science. But there is a *search* for a consensus, an agreement that there is an objectively existing world with properties over which it is possible in principle to arrive at a rough agreement. Although I personally don't see a sharp line of demarcation between science and other ways to seek knowledge (because scientific facts are better described as well supported theories), I agree with Cromer that an academic activity which explicitly rejects even trying to find agreement over what is objective knowledge is something different from natural science (but not necessarily less valuable).

[12] See Held (2003) for an alternative utilitarian view. He argues that Giles did the right thing when he killed the (mostly) innocent human Ben to stop Glory from ever returning and destroying the world ("The Gift," 5.22).

[13] Different readings of *Buffy* are certainly possible: Breton & McMaster (2001) sees the episode as a critique of "PTA-style rationalism" contrasted with "non-rationalist, teenage insight into an extra-rational reality". It could instead be argued that the teenagers were correct in their rational interpretation of the world, whereas the parents were misled by a demon that made use of the emotional impact of child murder.