Allison McNulty
Image of Scientist in a High School Classroom Final Report
Biol 545 Critical Thinking Biology in Society
Dr. Peter Taylor
12/9/12

What does a scientist look like? The answers will vary depending on whom you ask, but how many of those answers will have some similar stereotypical features? And, what is a stereotypical feature of a scientist? To answer this, I should address what I mean by a non-stereotypical scientist. A non-stereotypical scientist is a real-life scientist. Someone who is working in the field of science whether that person is historical (Albert Einstein, Humphry Davy) or contemporary (Serge Haroche, David J. Wineland) (Nobelprize.org 2012). Real-life scientists are more than the 1-dimensional stereotypical images of scientists found in books and movies whose stereotypical features are coloring how people see scientists, and by extension, science.

The goal of this project was to get high school students to see that the "popular culture" image of scientist contains stereotypical features, and to have students discover how those stereotypes came about in order to reconcile the pop culture image of scientist with a more accurate image of scientist. By "accurate" image of scientist I mean an image that takes into account real-life scientists like those mentioned above. In order to expose students to these images of scientist, I would ask them to look at blogs of scientists which could include those posted by the NY times online edition in their Scientist at work blog (Taylor, 2012a) and to look at biographies of famous historical scientists..

It has been known for years that there are stereotypical images of scientists in popular culture. In the 1970s David Chambers created a "draw a scientist" test (DAST) to see at what age children conceive an image of scientist. The students were asked to draw a scientist (with no other prompting or information from the teacher) and responses were graded on how many (out of seven) stereotypical features children included (Chambers, 1983). Later tests built upon Chambers' rubric (East Carolina University) by expanding it to include other facets of "stereotypical imagery" as the face of science changed. Interestingly, in Chambers' study only female children depicted women scientists (Chamber, 1983). Chambers looked at socioeconomic levels but could not make any solid inferences as to why children at higher socioeconomic levels come up with stereotypical features at an earlier age than children from lower socioeconomic levels (Chambers, 1983).

Again, we come up against how those stereotypes became so ingrained. Mark Alpert, writing for *Scientific American*, cited the influence of literature and media examples from Ian Fleming's *Dr. No* and H.G. Well's *Dr. Moreau* to Stanley Kubrik's *Dr. Strangelove*. He pointed out that more novels depicting a more realistic image of scientist would help the public finally banish those old stereotypes (Alpert, 2008). However, even in books written about scientists, the tone can come to reflect the author's biases more than factual information. In his work on science in the Romantic Era, Richard Holmes questions what it was like for the wife of Humphry Davy to "live with a man of science-who knew he was a

genius." (Holmes, 2009). In that simple phrase Holmes conveys to the public the idea that Davy was arrogant, temperamental and difficult to live with. In *The Disappearing Spoon*, Sam Kean refers to Watson and Crick as "[k]nowing that Pauling was stubborn but not stupid and would see his errors soon, [they] scrambled for ideas. They never ran experiments themselves, just brilliantly interpreted other people's data. And in 1953, they finally wrested the missing clue from another scientist." (Kean, 2010). Kean's language criticizes Watson and Crick while also seeming to commend them for their "brilliant" interpretations.

A commentator pointed out when reviewing this paper that with the rising levels of high school students cutting class or dropping out of high school all together, this quote from Kean could be a good, but charged topic to bring up in class (Lee, 2012). My take on this topic would be to assign a larger story of the search for the structure of DNA as a homework reading and to see if students bring up the idea of Watson and Crick as "slacker scientists". If no one mentions it, I would gently ask students what they thought of Kean's portrayal of Watson and Crick. Have they ever seen or read of a similar portrayal of a scientist in media or literature? How do they view Watson and Crick? Do they think Watson and Crick could have done their "interpretations" without school and other people's data? Hopefully, in that manner, I can point out that many discoveries build on what came before. Sometimes all it takes is a fresh viewpoint of someone else's data to make that great advancement. Of course, my underlying message would be that Watson and Crick could not have made their discovery without education.

Chris Mooney and Sheril Kirshenbaum cited the influence of Hollywood in maintaining stereotypical images of scientists and pushed more scientists to take a role as an advisor or consultant in the film industry to help weed out this occurrence (Mooney, Kirshenbaum, 2009). They also cited the influence of blogs as helping to expand the image of scientist by exposing the public to more scientists and scientific ideas. Unfortunately, as pointed out by Houston Chronicle science writer and Chron SciGuy blogger Eric Berger, people need to seek out those science blogs and are not likely to do so unless they already have an interest in the science or the scientist (Berger, 2008).

Could this lack of interest in science be blamed on science education in K-12? Ursula Goodenough, Ph.D. reviewed state standards across the U.S. in 2006 and declared the findings "troubling" (Fitzpatrick, 2006). Goodenough pointed out two significant problems with the new standards: students could not see how and why science is done or the impact of scientific discoveries; students could not see "the scientific worldview: a narrative account, with supporting empirical evidence, of current understandings of the origins and evolution of the universe, the planet and life (including humans), as brought to us from what are often called the historical sciences." (Fitzpatrick, 2006). Goodenough points out that most people learn best through storytelling and that science teachers should attempt to show the story of science via "big picture" concepts and narratives (Fitzpatrick, 2006). However, a crucial part of learning via storytelling is that students

must be able to critically evaluate and analyze the stories. If students learn science as a story and do not question it, they are no better off than if they learn science by rote memorization with no questions. The drive behind science and discovery would be gone. There would be no curiosity and the future of science would suffer. It is the same for image of scientist. When anyone passively accepts a media prompted stereotype, society suffers by losing some of its richness. Students need to learn to question what they read and see in order to make informed judgments. By asking them to question potential stereotypes of which they might not have been aware, I hope to strengthen their critical thinking and powers of analysis.

In the classroom I would ask students to complete an assessment based on Chambers' DAST work. I will explain the assessment will not be graded except on whether students took part in the activity (so they either get a check mark for participation or a zero for non-participation. This assessment is to draw a scientist. Students will then compare their scientist drawing to the "rubric", updated from Chambers' and others' work (East Carolina University) to see how many stereotypical factors they included and which, if any, they left out. After the first year, students could analyze previous years' examples according to the East Carolina rubric and any thoughts of their own on whether the images relate to stereotypical or more realistic portrayals of scientists for a bonus homework assignment (Lee, 2012). Depending on responses I would revise the assessment or, potentially, simply ask students to search the term scientists on Google Image and apply the East Carolina rubric to what they find.

Then, I would ask students to name a scientist. We would look at the list and see where those scientists come from (real-life or fiction) and which fields of science those scientists come from: medicine, physics, chemistry etc. From that list, as a class, we would brainstorm why students might have drawn the scientists they did. From my own observations of lists I have made, and from Chambers' work, it would be interesting to note how many scientists are male and how many are female and if that varies based on class ratios of male:female students (Chambers, 1983).

If no students can think of any scientists, or are not willing to share, then I will show them the NY times scientist at work profile (Taylor, 2012a), and ask students to analyze the text looking for (1) who the scientist is (name), (2) what field is he/she in, (3) where does he/she conduct his/her research, (4) what impact could his/her work have on the world and finally, (5) is he/she like what you imagined? Why or why not? Having just looked at the site myself I was astonished by the adventures of Dr. Alexander Kumar who just returned from "over-wintering" as the sole doctor at Concordia Station in Antarctica (Kumar, 2012).

In addition, I would like my students to meet the historical scientists they probably read about in their science textbooks all the time. To help maintain student interest, I would use a storytelling format to introduce notable scientists like chemist Humphry Davy, scientists Rosalind Franklin, James Watson and Francis Crick, and naturalist Charles Darwin after a lesson involving the scientist(s) and/or his/her/their work (Taylor, 2012d). My goal would be twofold: (1) for

students to realize how the stereotypical image of scientist does not apply to actual scientists and (2) how discoveries are made in science by real people.

For example, Humphry Davy made innumerable contributions to the field of chemistry and was to the Enlightenment era public what rock stars are to our time. His lectures were attended by the public and academics alike, he married one of the most sought after women in Great Britain, he traveled throughout Europe, and he competed against a French chemist to isolate an unknown crystalline substance (diabolically changing the dates of his work to claim that he made his discovery first) (Holmes, 2008). None of this is information students would likely know. But hopefully discovering it would enlighten a possibly boring lesson and help students to confront their ideas of "what is a scientist"?

I had initially planned to ask students to locate and critically think about stereotypical examples of the image of scientist and how they came about. For example, Dr. Frankenstein came about as a reaction to Enlightenment principles and a fear of progress and loss of morality. Dr. Strangelove was a satiric take on the arms race during the cold war, and the high number of German scientists who were recruited to work in the U.S. Post WW-II. However, a simple scavenger hunt for examples would likely not keep students interested or help them learn (Taylor, 2012b). And I want to avoid the lack of interest and lack of connections that Berger and Goodenough discussed. So I would ask students to look at what drives people. What drives scientists to study or work on specific projects, and what drives authors to write as they do?

This brings me back to the idea of curiosity that I mentioned earlier which I aim to tackle by asking students to research current and historical scientists. Students may use faculty web pages and blogs written by scientists to examine motivation of contemporary scientists. Then students would be asked, could what the scientists study, or what motivated them to study be viewed suspiciously? This would then, hopefully, lead to discussions on why science, technology and progress, and by extension scientists, have been and still are sometimes viewed with suspicion. This suspicion has its roots in mistrust of alchemists who sought to understand the natural world (Hadot, 2006). But it has continued, over time, to spill-over into a mistrust of technology and progress (Lederberg, 1974). In fact, a recently published article mentions that Mary Shelley's novel *Frankenstein* is still a powerful force because of its "criticism of science without a conscience" (Ginn, 2003), the idea which seems to be the foundation of every image of mad scientist, i.e. a lone figure who pursues science without a thought to ethical considerations.

To help students examine author motivations, I would ask them to look at the format and structure of a sample (literary or cinematic) and the target audience. Students would locate and analyze the use of metaphor, tone, mood etc. and the structure of storytelling. For example, students could analyze Shelley's story-within-a-story-within-a-story format in a chapter of *Frankenstein*, or Kean's use of language in a section of a chapter from his *The Disappearing Spoon*, and look at the author's target audiences to see how the author uses literary tools to get his/her point across.

Surprisingly, there is a new trend in science education that incorporates what is called "Lablit" (Fromme *et al*., 2012). This genre, according to the Lablit.com website of Dr. Jennifer Rohn, "depicts realistic scientists as central characters and portrays fairly realistic scientific practice or concepts, typically taking place in a realistic — as opposed to speculative or future — world." (Rohn, 2012), and it claims that Mary Shelley's gothic novel *Frankenstein* can be considered the first lablit novel (Fromme *et al*., 2012). The trend is to have students examine lablit samples in a variety of ways. Students can read the novels and discuss in "lablit reading groups" (Fromme *et al.*, 2012), read about a real life scientist in the NY Times' Scientist at work blog, pair-share a lablit sample with a current scientific issue (for example, pairing a reading on *Frankenstein* with news articles on DNA cloning) and then students must analyze their reading and/or re-write a scene from their fictional source. Fromme *et al.* (2012) suggest that students ask how the real-life depiction of scientific work affected the fictional story and if it brought up any questions that students would like to explore. A "Going Further" exploration asks students to write their own lablit story (Fromme *et al*, 2012). These ideas are good ones, but they do not seem to take into account the creative license authors could take with the scientific processes nor do they ask students to examine author motivation.

By understanding the reasons authors write as they do, students can understand how the stereotypical images of scientist arose and why they remain so popular. Looking at the tone and the purpose of the work being discussed could help students judge why the authors chose that particular image. To properly analyze text, students must learn to ask: who is the audience, what is the goal of the author(s), and what language does he/she use to convince the audience of his/her points. Reading samples of popular literature or watching video clips and asking students to analyze as above could give them the tools to make further decisions regarding author viewpoints, goals, use of language and, ultimately, effectiveness in persuading their audience. My goal would be to ask students to analyze two media samples (a fictional example of scientist and a non-fictional example of a scientist) and two, brief, literary samples (again, one on a fictional scientist and one on a non-fictional scientist). Due to anticipated time constraints, I would probably show the media clips in class on a shortened week prior to a break (like Thanksgiving week) and assign the readings for homework during the break. We would discuss the media examples in class to help students scaffold their thinking for what they will look for and how they will analyze when reading.

Notable examples in ficional cinema could include *Frankenstein* (1931) directed by James Whale with Boris Karloff (even if we did use an excerpt from Shelley's *Frankenstein* as a reading), or *Dr. Strangelove* (1964) directed by Stanley Kubrik and starring Peter Sellers. Both *October Sky* (1999) directed by Joe Johnston, and *The Right Stuff* (1983) directed by Philip Kaufman chronicle the days of rocket science and how pursuit of lofty goals swept through the US and both are based on true stories which could tie in fictionalized accounts of real scientists. Each film has a specific view point

and a goal in mind, and some serve as reactions to social attitudes of the time. The audience is the general public so it will be interesting to see how students react to such diverse portrayals of scientists and what goals and viewpoints they perceive to be in the mind of the author and how that influences their own image of scientist.

Given time, I might even scaffold a literary example in class. For example, Mary Shelley utilized the science of her day, and the popularity of gothic novels, when writing her famous *Frankenstein*. Shelley specifically used the notion of "Galvanism" Luigi Galvani's idea that electricity travels through nerves, which he tried to show in experiments where he caused muscle contractions in frogs by applying electricity (Ginn, 2003). This idea was then given, in fiction, the potential to bring the dead back to life, as evidenced in Shelley's work, and since then in a variety of films and books with the themes of science gone wrong during an electrical storm. In *Frankenstein*, Shelley's goal was to "criticize science without a conscience" (Ginn, 2003) but also to thrill and terrify her audience. In class we could discuss how Shelley's depiction of a mad scientist has come to have increasing prominence in the popular culture image of scientist since her day. I would ask students to brainstorm why they think that could be. Do they notice any similarities between Shelley's depiction of Dr. Frankenstein, and any scientists in blogs we have looked at so far?

In his *On the Origin of Species*, Darwin used metaphor as well as an idea of a personified Nature to help his audience grasp and accept his ideas. In using the metaphor of Nature as a "selector" Darwin met the need for a selector that he knew his audience (most of which had already read or were familiar with William Paley and Natural Theology) would require if they were to listen to his seemingly radical ideas. So, Darwin used Nature as his metaphor and his audience was content to see Nature as "God's handmaiden"(Taylor, 2012). Darwin knew his audience and he wrote for them.

However, Darwin's work was wildly unpopular at the time and continues to foster debate. When we reach evolution during the school year, I plan to present students with a brief reading on Darwin and ask them to think about the scientist who came up with this radical idea. Hopefully we will have time for a class discussion on how students saw Darwin pre/post the reading, and how they view his ideas. Do they think he helped or harmed himself by using the idea of a "selector", and by his cautious approach to broaching the subject of evolution?

Once students have a grasp on interpreting texts and have confronted the image of scientist in literature and media, I would ask them to look at a real scientist using Douglas Allchin's read, stop, think, write method (Allchin) combined with Taylor's interactive timeline (Taylor, 2012f). If I used Humphry Davy, 18th and 19th century science super-star, as my real scientist, I would provide a students with a basic linear timeline listing social, scientific and political factors of the time, including what led up to and resulted from the era. I would then present an instance from Davy's life and ask students to read, stop, think, and share. After the last share, I would ask students to add the information on Davy to their linear timeline. Then, students would create a more complex non-linear timeline incorporating interconnecting features using the

information from their timeline and the reading. I am hoping students can create a graphic depiction of how social and political factors play into science and affect a scientist. Unfortunately, due to time constraints this activity will likely be relegated to a bonus activity to be completed by students at home on their own (though I will provide them with a non-linear timeline example to help them get started) (Taylor, 2012f). To get students to complete the bonus activity I would let students use it to replace their worst quiz grade

To incorporate Allchin's method, I would give students a series of 1-2 paragraph length sets of information detailing Davy's competition with French scientist Joseph Gay-Lussac to isolate the crystalline residue left behind once a gun is fired. Davy submitted his results after Gay-Lussac, but dated them earlier in order to claim the prize from the French government. The competition divided the public back in Davy's native England between those who saw Davy as a patriot abroad besting their French enemy, and those who saw him as a traitor for visiting France, let alone accepting an award from the French government (Holmes, 2009).

The first section would consist of two paragraph length articles on the competition (from the time period), one vilifying Davy and one supporting him. Students would be asked to think about Davy's actions, what was going on in Europe at the time, and why the authors might have written as they did. The second section would give information regarding Davy's work for the British government and coal-miners in particular, asking students their thoughts on Davy's work. The third section would detail the actual experiment as it happened and students would be asked which initial author they agree with after reading the new information, and what their opinion of Davy is after reading what really happened. A final think would ask students to discuss whether they could trust the authors of the initial articles, including why and how author biases could come into play in the description of Davy.

The above would incorporate several lessons which, in reality, I probably would not have time to include in the year. So, another option would be to spend one class showing students how to analyze texts, including how to look for author biases, use of metaphor, tone, mood etc. both in a text and online where the biases could be seen in the url (whether it is .com, .gov, .org etc.) and a quick Google search of the author might reveal biases to students. The set up of the website, depending on background and color chosen, as well as vocabulary could play into mood and tone of the piece (though this is not always true). My peer-reviewer suggested that I rely on student reading levels to see if I can actually incorporate both forms of text analysis in one class (this might work only for AP or advanced groups) and use one of the two for a group that requires more scaffolding (Lee, 2012). In that case, I would probably scaffold the group needing more assistance with how to analyze a website since that is what most students rely on for their research. I would save analyzing a physical text for a different lesson. I would instead include some instruction on analyzing text when I scaffold how to analyze a literary sample of a scientist (real-life or fictional) from earlier in the paper.

A homework assignment I would like to assign early in the year would be to have students look at an assigned blog written by a scientist and to analyze the most recent blog post. I would have students free write in class what they think their scientist will look like, what they think the blog will be like, and why. They would hand in these writings at the end of class. At home, students would analyze the blog post using the strategies discussed in the previous paragraph and also briefly write how their assigned scientist met, or failed to meet, their expectations. In class we would discuss what students learned regarding the blog posts and their scientist. I would show students a brief PowerPoint presentation on the image of scientist, including clips of stereotypical scientists and ask students how those images might have arisen. Then, throughout the year I would pepper lessons with information regarding the scientists behind what the class is studying.

In this way, I could address the image of scientist but still save time. Of course, it would not be as in-depth as incorporating Allchin's methods on an isolated text, but I would use his methods as instruction for how to read any texts we come across. For their "shares", students could write, draw or discuss their ideas. I would also offer students the extra credit option of investigating relevant scientists in various lessons and examining how they are treated by different sources. For instance, when learning about DNA, I would ask students to look at the images and descriptions of Rosalind Franklin, James Watson, Francis Crick and/or Linus Pauling presented in the text, then look at other sources' takes on those same scientists. A good outside text would be Sam Kean's presentation of the "race" to discover the structure of DNA and the interplay between Pauling, Watson and Crick and Franklin (Kean, 2010).

With an eye on the available time to devote to this idea of image of scientist, I thought about creating a webquest on the image of scientist for students to complete. A webquest is a project where students are asked to analyze multiple different texts as sources and then create a product from their analysis (Kellinger, 2012). The product could be writing a paper, but for an image of scientist webquest the task for students to complete would be to explain the concept of scientist to visitors from another planet. This would entail explaining and debunking the myths and stereotypes to reveal a more realistic (Lee, 2012) portrayal of scientist and the role of scientist in society. This project would also allow for me to show students how to analyze text and then have them immediately apply that knowledge.

A simulation requires that students act the role of something and is set up in second person format. Students must make their way through a system (sometimes but not always in a quest format) to exhibit their understanding (Kellinger, 2012). For an image of scientist simulation, I would set up the system as "Congratulations! All your hard work and years of schooling paid off and you are now a scientist. You are being head-hunted by three different firms…" the different firms would lead students down different pathways where they would confront and have to explain stereotypical features of scientists, and science, while learning about actual scientific work via graphics, links and the branching pathways that result from their choices. Students will be asked to reflect on the choices they make at critical junction points (adapting Allchin's

idea to a new, more time-saving format).

Either a webquest or a simulation could be assigned for homework or as extra-credit, and the simulation could always be completed in class. For the text analysis portion, I would manipulate the simulation to include multiple texts (links to video clips, images, text documents and websites etc.) which students would need to analyze and respond to before they could move on. For the webquest I would use a wiki and include a page in that wiki to briefly explain how to analyze a website using some methods I developed for an education class. These include checking "Dot who?" to see whether the site is a .gov, .edu, .com etc. and AUCC (look for the *author*, when the page was last *updated*, who the site *cites*, and find *confirmation* of what you read) (McNulty, 2012).

What types of sites could I use? A science website of particular interest during an election year is ScienceDebate.org. Started prior to the 2008 election in an attempt to get the political candidates to address important scientific issues, ScienceDebate re-geared itself for the 2012 election. Notably, particularly for students, ScienceDebate was started by two Hollywood scriptwriters, one of whom is a great-great grandson of Charles Darwin, who wanted the candidates to debate scientific and technology issues in front of a live audience and televise the debate (Mooney, Kirshenbaum, 2009 & Otto, Chapman, 2012). Granted, this website itself does not discuss the image of scientist directly, but incorporating it as a text for students to analyze could help them see some of Goodenough's "big picture" impact stories (Fitzpatrick, 2006). However, as I would point out to my students, be wary of .org sites. See if you can identify the viewpoints of the website authors and if those viewpoints could skew or misinterpret information (for instance is the site a left-leaning site, a righ-leaning site etc).

In response to Peter Taylor's comments on my idea of having students set up their own forum on Image of Scientist, I have revised my idea of a summative assessment to incorporate the variety of under-represented voices Taylor mentioned (Taylor, 2012e). I would keep the idea of a forum as a summative assessment, but instead of having students create their own forums in wiki using the same target audience, I would assign each group a different target audience. I thought about assigning students a different "voice" and keeping the target audience the general public, but I thought that might be too difficult for students and could work against what I am trying to get them to learn about image of scientist. So, students would target audiences that (1) are indifferent about the image of scientist, (2) see scientists as nerds, (3) see scientists as mad scientists and (4) know someone in a field of science and are annoyed by the false images presented online and via the media.

Students would be expected to research their target audience and determine what myths and stereotypical images their audience is likely to believe (groups 2 and 3), why the audience might not care about science (group 1) and how to attract the attention of an audience that is well aware of a more realistic image of scientist (group 4). Also, students should

research the arguments their audience will be likely to make to support their own beliefs and reasons for thinking as they do in order to counter or support those arguments. Then, students will create a wiki where they debunk the myths and stereotypes of their audiences (for groups 2 and 3), stress why understanding image of scientist is important (group 1) and ask those with realistic image of scientists to share their thoughts and to comment on the debunked myths (group 4).

Each group will present their forum to the class for 10 minutes (on a double-period day) and will be given 10 minutes for the rest of the class to play at being their target audience. By this I mean, when group 1 students are presenting, the rest of the class pretends to be indifferent to the image of scientist at the start of the forum and gives the group feedback on whether the forum changed their mind or not. When group 2 presents, the rest of the class pretends to assume that all scientists are nerds and gives the presenters feedback on whether their forum made them think differently.

In this way, the use of the forum becomes more of a simulation in that students role play various audience members and those trying to share thoughts on what it means to be a scientist. I anticipate that this could become a little confusing, or difficult for my students, so I would explain the process at the beginning of the project and hand each student a rubric to use to identify how well the other forums worked at debunking target audience myths, getting them interested in why they should care about image of scientist, and incorporating other audience members to voice how their experiences with actual scientists have affected their views on image of science and resulted in them having non-stereotypical images of scientist.

I would provide students with some links to forums for them to examine, to help them explore their target audience and the ideas surrounding their audience (for group 2, the following site might helpful for them to explore "the nerd culture": http://nerdforum.org/ while group 3 might want to look at: http://www.sciencemadness.org/talk/). Group 4 could discuss forums like the following (http://classroom.all-science-fair-projects.com/forum/) which calls a classroom science fair project forum "The Mad Scientist's Forum" and (http://forum.evilmadscientist.com/) which is a site for art, technology and engineering that plays on the idea of an evil mad scientist. The use of the stereotypes in these forums would be interesting for students to address, i.e. how have certain groups come to "own" the stereotypical label and display it with pride? That pulls us away from the image of scientist to a different field of how people see themselves. Perhaps a part II to the image of scientist could be having students interview scientists asking the scientists how they define and describe themselves.

This is a lot to incorporate into a high school classroom, but the image of scientist has been skewed throughout history due to social attitudes and changes, as the media leaves most people with a false impression of scientist. By helping students discover the inaccuracies of the stereotypical image of scientist, I hold out hope that its popularity can be diminished. While humorous when the image is used in satirical settings, as in Kubrik's *Dr. Strangelove*, or to depict Jim Henson's charmingly bumbling Dr. Honeydew Bunsen and his lab assistant Beaker, the stereotype can bleed into the

nebulous fear of "science without a conscience" (Ginn, 2003) and fear of progress that is due to a lack of understanding of science. By helping high school students see for themselves how the image came about and how inaccurate it is, I hope to inspire them to question not only the image of scientist, but other social ideas that are, simply, popular inaccuracies based on myths.

Ideally, I hope to show my students that science is a fascinating, demanding but rewarding career. If at all possible I would like to invite people currently working in the field of science to speak to the class and answer any questions my students can pose about working in some field of science (Lee, 2012). If I cannot get a physical scientist to come to the class for a question and answer session then my other option would be to have students write to the scientist whose blog they explored (this could be in the form of a well-thought out comment post). Perhaps they could even ask their scientist what drives them or ask about similarities they seem to share. Whatever the students ask, hopefully the actual interaction with a real scientist would help students see beyond stereotypical images and possibly foster an interest in science where none was to be found before. In response to comments from Taylor, it might be worthwhile to streamline this unit and pick one or two assignments discussing stereotype then jump to really investigating real-life scientists via blogs (Taylor, 2012a). This would more likely fit time-constraints and also help keep students focused on their work.

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