

SCIENCE DOCUMENTARY:
A CASE FOR COLLAPSING THE DISTANCE

by
Kathryn Morgan Lain

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Cindy Stillwell

Approved for the School of Film and Photography

Robert Arnold

Approved for the Division of Graduate Education

Dr. Carl A. Fox

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Kathryn Morgan Lain

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ABSTRACT

This paper looks at conventional science documentary, placing it within trends of documentary, science, and science representation, all traditions with perceived connections to objectivity and authority. Bringing together documentary film theory, science studies, and my own experiences in an academic program dedicated to science filmmaking, I deconstruct conventional science documentary, highlighting why I find inadequate the current questions, assumptions, and methods that guide the making of these films. I demonstrate how such questions, assumptions, and methods reinforce a gulf between science and the general public, and celebrate science as being an objective, all-knowing, extrahuman authority. My case study of The Science of Sex Appeal is an attempt to call attention to that gulf (and related celebration of science) and provide an example of a more active and critical approach to viewing these science documentaries. I conclude that there is a need for makers of science documentaries to venture beyond the problematic conventions that guide these films, to work toward a new type of science film that can help reconstruct the relationships between science, science film, and the general public.

INTRODUCTION

Science documentary is a funny animal. I'm not talking about blue chip natural history/wildlife films or even about An Inconvenient Truth or its environmental advocacy film successors. I'm talking about the ones that maybe you sat through in high school science classes, that you came across last time you ventured onto NASA's website, or that you will find on channels like the Discovery Channel, Science Channel, and TLC (yes, the same channel that has also brought such hits as Jon & Kate Plus 8 and What Not To Wear into so many living rooms). You're probably familiar with the formulaic elements: a very knowledgeable(-sounding) narrator or on-screen host, who is often a white male (sometimes with a British accent) and always omniscient; colorful computer-generated and computer-animated graphics and diagrams, often accompanied by high-tech sound effects; maybe images from other scientific instruments like spectrophotometers and MRI machines; an expert—a *scientist*—who typically looks *near* you but not *at* you while speaking and is introduced by a slick graphic bar across the lower part of the frame, informing you of their name and expertise; flashy transitions that splice together diagrams, graphics, and footage that illustrate what the narrator and experts are telling you; lots of facts (or things that sound a lot like them). Especially in the broadcast programs, the word "science" often appears in the title: Science of the Movies, Science for a Hungry World, and yes, Science of Dragons. This type of film is a strange hybrid of traditions that begs analysis as documentary, as part of science, as a form of science representation, and as a mix of the three.

For just over three years, I have been working on my Masters of Fine Arts degree in Science and Natural History Filmmaking at Montana State University. This program is unique in its focus on genres of filmmaking that have gotten less academic attention than have many others, such as social documentary and narrative/fiction film. One of the loftier goals of the program, as a visit to any of the film criticism or theory class meetings would tell you, would be to take people with science backgrounds and train them as filmmakers who can help to reinvent the genre(s) in ways that would avoid many of the problems that continue to plague these films. Though such a goal might sound like it reflects some combination of arrogance and academic naïveté, I see it as a worthwhile project with cultural merit (which should become apparent later on in this piece) since I do believe that these types of films are rife with problems that too often are unnoticed, undiscussed, or written off as unimportant. (Partly because there is already a decent body of truly interesting and insightful scholarship on natural history film¹ and because of the relative dearth of attention to science documentary, I will limit the focus of this paper to an issues related to the latter.)

While I share with many students in my MFA program what seems to be a common goal of approaching science documentary filmmaking with a questioning eye, we tend to disagree on what the most important questions should be. The most popular questions I have heard from my fellow students these past few years have revolved around how we as filmmakers can go about making these science documentaries more fun, more entertaining, and more exciting. I think these questions are indicative of a

¹ These include Watching Wildlife by Cynthia Chris, Reel Nature by Gregg Mitman, Wildlife Films by Derek Bousé, Animals in Film by Jonathan Burt, and “Viewing What Comes Naturally: A Feminist Approach to Television Natural History” by Barbara Crowther.

misidentification of the problems that exist in science documentary and that a focus on addressing these would allow what I recognize as the more pressing problems to continue, if not exacerbate them. The important problems, in my mind, relate to the cultural construction of science, science's role in constructing culture, and the ways science documentary fits into these interrelated processes. It is for this reason that my interrogation of science documentary in this paper will incorporate not only documentary film theory, but science studies² as well.

Since the publishing of Thomas Kuhn's The Structure of Scientific Revolutions in 1962, science studies has taken a critical look at relationships between science and culture. Participants in the discussion have questioned traditional notions of scientific objectivity, rationalism, and authority from perspectives of philosophy, sociology, feminist studies, cultural studies, and science itself. They have raised questions of how unrecognized or unacknowledged human and cultural biases have very real effects on seemingly objective, rational areas of science – from interpretation of data to theory selection to retention of minorities in scientific fields. (Keller, Latour, Hess, Haraway) Science studies is not an anti-science pursuit, looking to dismiss or do away with science; rather, it calls for a re-evaluation of oft-overlooked aspects of science and how science fits into society. David Hess tells us in Science Studies:

Science studies tracks the history of disciplines, the dynamics of science as a social institution, and the philosophical basis for scientific knowledge. It teaches, for example, that there are ways of developing sound criteria for evaluating opposing theories and interpretations, but also that there are

² I use this term colloquially to encompass a variety of often-opposing critical approaches to science, including philosophy of science, feminist science studies, cultural studies of science, history of science, sociology of scientific knowledge, and science and technology studies. For an overview of these various approaches, see Science Studies by David Hess.

ways of finding the agendas sometimes hidden behind a rhetoric of objectivity. In the process, science studies makes it easier for laypeople to question the authority of experts and their claims. It teaches how to look for biases, and it holds out a vision of greater public participation in technical policy issues. (1)

I contend that many of the approaches that science studies has taken in critiquing science can and should be extended to science documentary. Neither science nor science documentary exists in a vacuum. They are arguably both products of and influential participants in the culture of which they are a part. I see science documentary as both symptomatic of and contributing to larger societal issues involving science. Regardless of how small the role science documentary might play in the larger cultural context of “science,” it warrants critical examination.

I will begin with a more general look at parallels between the public perceptions of documentary film and science, and investigate how science documentary relates to these similarly-perceived traditions. I will then shift the discussion to current approaches in science documentary filmmaking, deconstructing its goals and assumptions and proposing how those relate to audience perceptions of both documentary and science. I then will look at Discovery’s 2009 program The Science of Sex Appeal as a case study. The purpose of this case study is not to merely rehash the preceding general discussion in more specific terms, but rather to engage in more direct discussion of some of the things that are at stake in the making and viewing of these seemingly benign science documentaries. The idea is to highlight a particular subgenre of science film—what you

might call the “gender science” film³—that, while very conventional in its execution, is distinct from many other types of science documentary in that its objects of study are humans—white women, in particular—and interhuman relationships. In a more explicit, obvious way than most other types of science film do, this film (like others in its subgenre) pulls the personal-political into the realm of the “scientific,” yet it makes sure that the scientific and filmic remain off-limits to criticism from or dialogue with the realm of the personal-political. It is my goal to use the methods of deconstruction established elsewhere in this paper to pull The Science of Sex Appeal (as a representative work in the “gender science” subgenre of science film) back into the realm of the personal-political and, in doing so for this more blatantly problematic example, demonstrate the importance of venturing beyond the standard questions when approaching science documentary in general.

Over the course of this paper, I aim to demonstrate the need for shifting the focus of discussion around conventional science documentary⁴ away from devising new edutainment strategies and toward fostering new societal relationships with science, and in doing so, I hope to make a case for a move toward an alternative science cinema.

³ Other good examples of films in this genre would include the six-part TLC series Desmond Morris' The Human Sexes (Discovery 1998) and Discovery's two-part Science of the Sexes (2003).

⁴ Though I will drop the “conventional” in future references to this type of filmmaking, know that it is implied. Into this category of conventional science documentary I'm placing films that fit the basic description I gave in the introduction to this paper. I am aware that I am making generalizations, even as I narrow my gaze discussion from documentary to expository documentary and eventually to science documentary. I have deliberately chosen to do so with the goal of addressing trends, mechanisms, and formulas that show up time and again in this genre. Individual films undoubtedly present exceptions to these generalizations, and I would hope that an awareness of the generalizations would allow one to notice and question those exceptions.

ENGAGEMENT THROUGH DISTANCE

“A good documentary stimulates questions about its subject, not itself.”
 —Bill Nichols’ phrasing of “many a documentarist’s motto” (Nichols x)

I have chosen to use the problematic term “documentary”⁵ in this paper since it is a widely-accepted term for films that appear to share some indexical relationship with the historical world. In short, these films⁶ implicitly and/or explicitly claim to “document” stories, experiences, occurrences from the historical world, whereas fiction/narrative films might be said to “construct” both stories and worlds, even if those stories or worlds resemble our own.⁷ In both traditional documentary and traditional fiction/narrative, the viewer’s attention is supposed to be kept on the argument or story, not on the apparatus presenting it. Experimental cinema (or that deemed avant garde, underground, alternative, art house, and so on) tends to reside outside the commercial or educational spaces inhabited by science documentary, so I won’t spend time contrasting the two.

The reliability of documentary as discourse about and authority on the historical world has been addressed in depth by documentary film theorists such as Bill Nichols and Michael Renov. In Representing Reality, Nichols divides the documentary genre into different modes, which “represent different concepts of historical representation” (23). Science documentary tends to fall into what he refers to as the expository mode, which

⁵ Discussion of the appropriateness of the term is beyond the scope of this paper, but I do think it would be a worthwhile debate for another place and time.

⁶ The term “films” is also problematic. In this paper, I use “film” and lump together in it all the various origination and presentation formats (video, computer-generated imagery, film, and so on) used in this type of science documentary.

⁷ See Bill Nichols’ Representing Reality for an in-depth analysis of differences and similarities between documentary and fiction/narrative film.

relies on such conventions as “voice-of-God” narration (34-38). Concealed from public view are the structures and processes upon and out of which these documentaries are constructed. Its perceived status as evidence, as opposed to interpretation or construction, is discussed by Nichols, who points out that “[t]he status of documentary as *evidence from the world* legitimates its usage as a source of knowledge” (iv). It is constructed and received (especially by those lacking familiarity with the particular topic of the film) as an authority on its particular subject matter.

However, documentary—just as science studies has demonstrated is also the case with science—is not the objective, value-neutral window to the world that it tends to appear to be. It is a human and cultural construction (and construct), and as such, it is ideological in nature, regardless of whether this is admitted or recognized. Though the viewer is drawn in (or, so is the goal of the documentarist) to the subject matter and argument in which it is packaged, s/he is distanced from the structures and processes upon which the documentary is constructed. The documentary’s authority and objectivity therefore do not become the focus or the object of scrutiny. Various devices in expository documentary work to foreground the subject matter and authority of the documentary itself while rendering invisible the value-laden structures and processes of construction, and I refer to these devices as *mechanisms of distance*.

One might consider these to instead be mechanisms of engagement since they may help engage the viewer in the subject matter, but I prefer to focus on their role in distancing the viewer from the structures that must remain hidden in order for the film’s objective authority to go unquestioned. Generally speaking, these mechanisms of

distance include both structural and stylistic elements, ranging from logically-organized, authoritative argument to omniscient, confident narrator. They help to engage the viewer and direct her/his attention to the subject matter by stimulating interest, and at the same time distance the viewer from the means of knowledge production and construction by maintaining appearances of objectivity, a concept that is itself predicated on notions of distance. Nichols explains:

In expository documentary...the presence of the filmmaker is shifted to the sound track and eliminated from the image track...Direct address, either through an off-screen commentator or on-screen voice of authority, endorses the tradition of disembodied, universalized knowledge. Such speech, like the clinical gaze, requires the acceptance of a discipline that detaches knowledge from the body that produces it. (89)

Perhaps more so than other forms of documentary, science documentaries are typically made with the end goal of teaching people about a particular subject or concept while demonstrating just how cool/awesome/interesting/exciting that subject/concept's field is. The science documentary's authority is established by not only its status as documentary, but also its mere association with science. "Well, hey, it speaks for science, and science is an objective authority..." is a sentiment I like to imagine that science documentary filmmakers attribute to their films' viewers. As both documentary and science, science documentary makes a double-claim to status as objective window onto the world.

The truth claims made by science documentaries extend beyond those normally attributed to or implied by other types of documentaries. This is because these films are linked (often through their titles or through a narrator's explicit declarations toward the beginning of the film, but also aesthetically) to science, which tends to be placed at the

pinnacle of American hierarchies of approaches to understanding our world. Science, though indeed a collection of fields and practices, is also a cultural construction/construct. The term has come to encompass those particular scientific fields and practices, but colloquially, also an amorphous, almost god-like knowledge-discovering and knowledge-holding entity—and that particular type of knowledge itself (as in, the “science” of earthworms, etc.). I use the term big-S, italicized *Science* to describe this hybrid of all the specific scientific discourses and the intangible phantom science-of-the-imagination. When one looks at or participates in any one aspect or field of science, they are also looking at or participating in *Science*. Science documentary is actually *Science* documentary. And *Science* documentary, in its packaging and selling of *Science*, participates in the production of what I like to think of as *Science*TM. Like Saturday Night Live’s Shimmer (back in 1976) that’s both a floor wax *and* a dessert topping, *Science*TM works double duty. It’s *Science*! It’s a commodity! It’s *both*! *Science* becomes *Science*TM, another commodity to be marketed, desired, bought, and sold. *Science*TM is not a process in which you participate, and it is not a service that you can seek out to aid you in your own projects of discovery and understanding; it is a self-contained product that contains authoritative knowledge about the world.

In her essay “Deanimations: Maps and Portraits of Life Itself,” Donna Haraway remarks on problems with what she considers society’s fetishization of the gene. Haraway pulls her definition of fetishism from Karl Marx’s notion of commodity fetishism:

Commodity fetishism is a specific kind of reification of historical and human interactions with each other and with an unquiet multitude of

nonhumans, which are called nature in Western conventions. In the circulation of commodities within capitalism, these interactions appear in the form of, and are mistaken for, things. (185)

Replacing commodities with genes, Haraway argues that: “Gene fetishism involves ‘forgetting’ that bodies are nodes in webs of interactions, forgetting the tropic quality of all knowledge claims” (186). “[T]he gene is fetishized when it seems to be itself the source of value; and those kinds of fetish-objects are the stuff of complex mistakes, denials, and disavowals” (187). She continues:

[G]ene fetishism is compounded of a political economic *denial* that holds commodities to be sources of their own value, while obscuring the socio-technical relations among humans and between humans and nonhumans that generate both objects and value: a *disavowal*, suggested by psychoanalytic theory, that substitutes the master molecule [gene] for a more adequate representation of units or nexuses of biological structure, function, development, evolution, and reproduction; and a philosophical-cognitive *error* that mistakes potent abstractions for concrete entities, which themselves are ongoing events. (190)

Appropriating Haraway’s extension of commodity fetishism to the gene and integrating a more colloquial understanding of fetishism, I suggest that *Science* documentary participates in the fetishization of *Science*TM. *Science*TM becomes “the source of its own value.” *Science* documentary effectively divorces *Science*TM from its means of production, and *Science*TM as an entity loses its relationship to process and replaces the interactions and actors responsible for the creation of *Science*, *Science*TM, and *Science* documentary. Its celebrated, sublime value/power hinges on this erasure, which is effectively maintained by the mechanisms of distance employed in *Science* documentary.

In the processes of commodification and then fetishization, *Science* comes to resemble some sort of religion or deity in which one either believes (and which one unquestioningly worships) or does not believe (and dismisses). To “believers,” *Science* gives unfettered and objective access to knowledge, and the knowledge gained through *Science* trumps that acquired through other cultural processes such as art. *Science*’s texts and processes are to be understood only by studied practitioners (*Scientists*), and it is only through those revered, extrahuman (i.e., *beyond* or *outside of* human) *Scientists* that we can understand the world. To “non-believers,” *Science* is easily written off as untrue (“I don’t believe in evolution,” “I don’t believe in global warming,” etc.). Such a binary system of belief/non-belief is problematic and denies—on both sides—any meaningful dialogue about the relationship between *Science* and the larger culture(s) of which it is a part. Needless to say, *Science* documentaries tend to be made by “believers.” Meaningful dialogue is denied.

CURRENT APPROACHES TO *SCIENCE* DOCUMENTARY:
RAZZLE DAZZLE 'EM

Give 'em the old razzle dazzle, razzle dazzle 'em
 Give 'em an act with lots of flash in it and the reaction will be passionate
 Give 'em the old hocus pocus, bead and feather 'em
 How can they see with sequins in their eyes?
 What if your hinges all are rusting?
 What if, in fact, you're just disgusting?
 Razzle dazzle 'em and they'll never catch wise!
 —Billy Flynn's "Razzle Dazzle" in *Chicago* (Ebb)

Through the *Science* documentary, *Science*TM (the fetishized commodity) and *Science* become interchangeable. Current approaches to making this type of film treat this interchangeability as unproblematic, if not as the desired outcome. I have put together a summary of what I consider to be the basic questions, assumptions, and goals involved in current approaches to *Science* documentary. I then relate these to the conventional Plan of Action—ways in which these questions, assumptions, and goals are reflected or addressed in the *Science* documentary itself. In no way is it an exhaustive discussion, but I do think it is a fair representation of many of the current trends. This summary combines observations I have made while discussing and working with other makers of *Science* documentaries and viewing an array of contemporary *Science* documentaries.

Summary of Current Approaches

Perceived Societal Problems: There seems to be a general perception among *Science* documentarists that the average person does not know enough about particular *Scientific*

topics. Another perceived problem is that the general public thinks *Science* is boring, obtuse, and perhaps irrelevant. Related to these two perceived societal problems are implicit assumptions that *Science* documentary is or can be an effective tool for solving these problems.

Assumptions About Viewers: It is generally assumed that the average viewer lacks knowledge about the *Scientific* topic at hand. However, it is assumed that s/he is familiar with a certain image or idea of *Science*: on the one hand, it is an objective, knowledgeable authority while on the other hand, it can seem dull and difficult to understand. A third assumption is that *Science* documentary is one of the main ways, or possibly the *only* way, the general public “interacts” with and is informed about *Science*.

Overarching Goals for *Science* Documentary: These would be to generate more public interest in *Science* and to teach the general public about *Science*. These stem from the aforementioned perceived societal problems and assumptions about viewers.

Proposed Filmic Solution: In order to achieve the above-mentioned goals, and taking into consideration the above-mentioned assumptions, *Science* documentarists set out to make films that will make *Science* more fun, interesting, and easy-to-understand.

Plan of Action: I’ve chosen to highlight here just a handful of filmic choices—and accompanying rationale—that I think are representative of the types of choices being

made in this genre in order to address the problems, goals, and assumptions I have brought up.

1. ***Go for simple, clear lessons or arguments.***

Rationale: This will make *Science* more understandable for the general public.

2. ***Incorporate interesting facts.***

Rationale: This will help make the topic—and thus *Science*—fun and intriguing. The facts also serve as proof of the film’s authority and reliability as a source for *Scientific* knowledge.

3. ***Deliver information through spoken word of a matter-of-fact, confident narrator.***

Rationale: Utilizing scripted narration will allow for the delivery of clear, concise information neatly packaged as a simple lesson that can be easily understood. When performed by a confident and authoritative narrator, the viewer will be able to trust that the information is credible and complete.

4. ***Incorporate on-camera experts (i.e., Scientists).***

Rationale: This will further contribute to the film’s credibility and authority. This also allows *Science* to speak for itself. Information is coming straight from ~~the~~ *Science*’s mouth.

5. ***Utilize colorful, animated computer graphics.***

Rationale: This will make *Science* more understandable and more visually interesting. It also allows the filmmaker to visually represent concepts that cannot be filmed.

6. ***Incorporate Scientific instruments and the images they produce.***

Rationale: Because these are easily recognizable as being “*Scientific*” and do provide

real *Scientific* data during real experiments and diagnostic procedures, their inclusion contributes to the film's authenticity and authority.

Through all of these problems, goals, assumptions, and solutions runs the overarching implicit assumption that people should know about *Science*. Any questions related to *Why?* tend to go unasked. Or, when they *are* asked by others, they tend to be met with confused looks.

Deconstructing the Conventional Plan of Action

The above-described Plan of Action is rooted in the previously-mentioned perceived problems, goals, and assumptions. Those problems, goals, and assumptions tend not to be discussed or questioned, but are rather implicitly understood and accepted. Focus is instead placed on such choices as I described in the Plan of Action. I hope that addressing my own concerns with the current typical Plan of Action will also call attention to the inadequacy of the implicitly-understood problems, goals, and assumptions.

I would once again like to follow Donna Haraway's lead as I take a critical look at the Plan of Action I described above. In her essay in Picturing Science, Producing Art, she describes her critical approaches to such cultural products as cartoons and advertisements: "I over-read, naturally; I joke; I suggest a paranoid reading practice...jokes are my way of working, my nibbling at the edges of the respectable and reassuring in the technosciences and in science studies" (195).

I am not concerned here with whether or not such a Plan of Action and the choices it involves are successful at accomplishing their goals. (It might be worth noting, though, that the striking similarities in the approaches to *Science* documentary—running the gamut from Discovery Channel to NASA’s online educational videos—suggest that there might be some measure of real or perceived “success” of such approaches.) What interests me more are other possible implications of such choices. Join me now as I employ Haraway’s “paranoid reading practice.”

1. ***Go for simple, clear lessons or arguments.***

Other implications: This type of lesson or argument tends to imply the existence of consensus, universal knowledge, a notion disputed by many critics of *Science*, such as Donna Haraway. This approach ignores questions of how knowledges and information are constructed and then used. Such simple, clear lessons tend to rely on causal relationships and single interpretations of data (e.g., “the results are X, and this means Y,” where Y is a value-laden interpretation that goes uninterrogated) and imply that *Scientific* knowledge is predicated on inevitability and discovery-without-interpretation. They reduce complexities to binary thinking (yes/no, black/white, true/false) and in doing so deny the complexities of *Science*. *Science* shares a long history with binary thinking, and that relationship has been criticized at great length by critics of *Science*. Dualisms or binaries related to *Science* include *Science* vs. art, mind vs. body, objective vs. subjective, rational vs. emotional. Each of these binaries is set up as *Science* vs. non-*Science*. And considering that the first halves of these binaries (the *Science* halves) are culturally associated with masculinity and men while

the second halves (the non-*Science* halves) are associated with femininity and women, there are implied associations between *Science* and masculinity/men on the one hand and non-*Science* and femininity/women on the other. Evelyn Fox Keller explains in Reflections on Gender and Science:

The consequence of such a division is not simply the exclusion of women from the practice of science. That exclusion itself is a symptom of a wider and deeper rift between feminine and masculine, subjective and objective, indeed between love and power—a rendering of the human fabric that affects all of us, as women and men, as members of a society, and even as scientists. (7)

A simplified, clear, inevitable lesson may indeed aid in teaching particular *Scientific* subject matter, but it also implicitly presents a very particular—and problematic—image of *Science* and *Scientific* knowledge while implying indisputable universality.

2. ***Incorporate interesting facts.***

Other implications: *Science* is reduced to a collection of facts, rather than being about any deeper understandings of truth. Facts easily come to appear indisputable, self-evident, and outside the realm of human influence or interpretation. The hidden constructedness of facts was meticulously studied and analyzed by sociologists of *Science* Bruno Latour and Steve Woolgar in Laboratory Life: The Social Construction of Scientific Facts, their sociological/anthropological study of processes and rituals in laboratory *Science*. The word “fact” has been divorced from its root in process (*factum* is the neuter past participle of the Latin *facere*, meaning “to do” [Dictionary.com]) and has come to imply an entity or piece of information that is objective and irrefutable. In these films, facts are become synonymous with objective knowledge. They serve as proof or evidence for larger claims about the particular

subject matter, whether that be photosynthesis, gravity, or human life. The focus on the fact avoids questions related to the *How?*s and *Why?*s of *Science* and implies a self-sufficiency of evidentiary arguments. That something is factual is all one needs to know. How it came to be regarded as factual, how that knowledge is put to use, why it was investigated, and so on, are irrelevant. In their apparent simplicity, these facts become unquestioned interesting tidbits, factoids that support the simplified, clear, inevitable lessons I discussed above. They feed what Bill Nichols calls an epistophilia, “a pleasure in knowing” (178). By directing the viewer’s attention away from more complex questions about the constructedness of *Science*, facts, and knowledge, it is the fact (or factoid), and not an interrogation of its construction or implementation, that the *Science* documentary posits as the source of this pleasure.

3. ***Deliver information through spoken word of a matter-of-fact, confident narrator.***

Other implications: That the bulk of a *Science* documentary’s lesson is delivered verbally suggests a primacy of straightforward, word-driven argument. Images and non-verbal sounds (e.g., sound effects, music) support the verbal track, and that verbal track is to be taken at face value. There is no invitation for the viewer to delve below the surface and ask deeper questions. This is not a conversation; it is an informative lesson or lecture in which information flows in one direction. *Science* is made up of objective information, not metaphors to be parsed. When the lesson is delivered with confidence by an off-screen narrator, that voice becomes the Voice of *Science*. Through this Voice of *Science*, the *Science* documentary becomes *Science* itself, not a representation of *Science* (in reality itself a way of representing). While

the Voice of *Science* may be reinforced by on-screen experts, this Voice of *Science* is *Science* itself, reinforcing notions of consensus, universal knowledge, a problem I touched on earlier. The logical-sounding, evidence-supported verbal argument and its confident, matter-of-fact delivery together reinforce the appearance of objectivity and authority.

4. ***Incorporate on-camera experts (i.e., Scientists).***

Other implications: These experts—*Scientists*—are sources of information. They are not humans with whom we empathize, and their importance lies not in who they are as actual people; they are important because they are vehicles and purveyors of *Science*. The graphic bars, or “lower-thirds,” that introduce them establish their authority, justify their presence in the film, and visually demarcate the realm of *Science* from the realm of Regular People. And as Carl Gardner and Robert M. Young point out in “Science on TV: A Critique,” the typical absence of an interviewer during the on-screen explanations from *Scientists* adds to the impression of objectivity and universal-truth-through-*Science* (177). They also address how the idea of direct debate between *Scientists* is completely avoided:

This is in striking contrast with interviews on programmes where it is accepted that the issue is controversial and open, to some minimal degree at least, to public scrutiny, doubt, debate, etc...When scientists disagree on television, one talking head is followed by another, and they are almost never in direct conversation, much less debate... (177)

The *Scientist* is cast into the realm of the extrahuman. S/He is not someone with whom we are supposed to connect. Stereotypes of *Scientists* as abnormal, antisocial, socially awkward, brilliant, absent-minded, asexual, disconnected, etc. can remain

intact and possibly add to the mysteriousness and authority of these human-like extensions of *Science*. *Science* is in the value-neutral, objective realm of the extrahuman.

5. ***Utilize colorful, animated computer graphics.***

Other implications: These flashy, eye-catching graphics remove traces of any human involvement in the process of making them. They give the impression of a rational, objective world that exists outside of human interpretation. Technology and *Science*, not humans, produce these images. They show us things about the world that humans cannot otherwise perceive. Any indication of human involvement in technological and *Scientific* image production is absent. The graphics employed in *Science* documentaries often are visually similar to images produced by *Scientific* experimental or diagnostic instruments, and this visual similarity both reinforces the impression of objectivity and authority (a *Scientific* instrument, not a human, made this) and fosters the viewer's unquestioning dependence on *Scientific* experts' explanations. The computer-generated graphic, its construction, and its explanation are extrahuman, and so *Science* and its practitioners become extrahuman

6. ***Incorporate Scientific instruments and the images they produce.***

Other implications: The inclusion of images of these instruments and the images they produce (or, in the terminology of Bruno Latour and Steve Woolgar, the *inscriptions* they make) add to a *Science* documentary's *Scientific* authenticity, but that authenticity is built upon the viewer's visual recognition of such instruments and images/inscriptions as being part of *Science*, not upon any deeper understanding of or

meaningful interaction with them and how they are used. Turning briefly to semiotics here, I assert that inscriptions of *Scientific* instruments (e.g., CT scans, MRI images, absorption spectra) might be considered indexical images to those who are trained to interpret them, but when such an image appears in *Science* documentaries, that indexical bond is broken. The image/inscription becomes a symbol or icon that represents *Science* and reinforces the distance between viewer and *Science*. The film invites viewers to limit their understanding of or relationship with the image to mere recognition of it as representing *Science*. The image no longer represents the particular diagnostic/experimental event or its results; it now represents *Science's* ability to make sense of the world in ways that humans alone—and especially the viewer—cannot. The frequent accompaniment of these images/inscriptions with images of the *Scientific* instruments that produced them only adds to this distancing effect. The visual presence of the instrument is a reminder that these images/inscriptions are made by technology, by *Science*, not by humans. The people who operate and understand these instruments and interpret their inscriptions are not Regular People, not the viewer; they are extrahuman *Scientists*.

All of these filmic choices that fall under the Plan of Action I have described, along with many more that are made for reasons similar to those I described earlier, are mechanisms of distance. They distance the viewer from the constructedness of the film, from the constructedness of *Science*, and from knowledge production. Though the purpose of the *Science* documentary may be to educate viewers, they also operate to remind viewers of their own ignorance and of *Science's* universal knowledgeability.

Science has unique access to knowledge. The general public lacks this access, and so *Science* documentary comes in to provide limited access (even if it is only voyeuristic access) to that knowledge. Through the *Science* documentary, knowledge passes from *Science* to the general public, and not the other way around. *Science* is built on an objectivity predicated on distance/detachment from human values and emotions, so knowledge cannot possibly move in the other direction. Or so implies the *Science* documentary.

Through these filmic choices, these mechanisms of distance, the *Science* documentary posits *Science* as an extrahuman endeavor that is unaffected by human values, beliefs, and culture. Its practitioners are likewise unaffected; they exist outside of the realm of the everyday, outside of humanness. They, as part of—and synonymous with—*Science*, are objective authorities.

And just as *Science* and *Scientists* become synonymous, so do *Science* and the *Science* documentary. The filmic choices I have described, the mechanisms of distance, perform a trompe l'oeil that declares, “What you are looking at is science itself!” Even the titles often blatantly declare this: PGA Tour Production’s The Science of Golf, National Geographic’s Fight Science, Discovery’s The Science of Storm Chasing, to name a few. The razzle dazzle of this *Scientific* side show, filled with sparkly factoids and impressive feats of technology, convinces its audience that it *is Science*, the real deal. *Science* and its flashy, fun packaging as a documentary become one, the same thing. The existence of the documentary as a mediating presence is erased. *Science* is a set of inevitable, easily devised, easily interpreted, easily explainable experiments and

concepts. The documentary *is Science*, not a human-constructed interpretation of other human endeavors. It is extrahuman, as is the *Science* it presents, as is the *Science* it *is*.

The implicit claim (or assumption) here is that the way that *Science* documentary deals with the topic is the same way in which *Science* deals with the topic. Whatever unacknowledged and/or unrecognized biases and values silently influence *Science*, there are just as many (or more) that influence the making of a *Science* documentary. The *Science* documentary denies bias and value on both levels. Questions of *Why?* and *How?* would pull *Science* back to the realm of the human, the personal-political, the cultural, and since this is taboo, these questions are avoided through mechanisms of distance.

CASE STUDY: THE SCIENCE OF SEX APPEAL

I turn now to a case study: The Science of Sex Appeal, a Discovery production released earlier this year. Using the above-discussed Plan of Action as a guide, I want to deconstruct this film and use this deconstruction to demonstrate the importance of asking the *Why?*- and *How?*-type questions and therefore the value of pulling *Science* back to the realm of the human, the personal-political, the cultural. I selected this particular *Science* documentary for my case study for a variety of reasons, and chief among them are the following. One, it is currently widely accessible, as clips from it are being featured online at Discovery's website at <http://dsc.discovery.com/videos/science-of-sex-appeal>. Two, it follows the *Science* documentary conventions—the Plan of Action—that I have described: it employs simple, clear lessons and arguments; it incorporates interesting facts; it delivers a verbal argument through a matter-of-fact, confident narrator; it incorporates on-camera *Scientist*-experts; it utilizes colorful, animated computer graphics; and it incorporates *Scientific* instruments and the images they produce. Three, and the most important reason for my discussion, it is part of a subgenre—which I referred to in the introduction of this paper as the “gender *Science*” film—of *Science* documentary that is unabashedly sexist. Let me expound on this last reason a bit.

Up until now, I have focused my discussion on more general critiques of broader issues such as the unquestioned authority, binary thinking, and hidden constructedness of *Science* and *Science* documentary. I have also argued for the need for *Science* and

Science documentary to embrace (or admit?) and *be* embraced (or accepted?) as human endeavors, projects, and products that operate not on some lofty, distanced, objective, omniscient plane but in the realm of the human, the personal-political, and the cultural. And if conventional *Science* and *Science* documentary are not yet at this point—and I don’t believe they are—I would like to take the opportunity to take a representative of *Science* documentary—and therefore *Science* by proxy—and pull it back to this realm myself. And the representative I have chosen is a prime candidate because it proclaims itself as being outside and above this realm, while at the same time being a *Scientific* and therefore objective and all-knowing authority on this realm.

My assumption here is that you as the reader might have a more vested interest in deconstructing another’s authoritative explanation of your personal interests, choices, sexuality, body, and objectification than you would in doing to a similarly authoritative explanation of, say, high-energy gamma rays. And if this is the case (I know that *I* have a far deeper and more visceral stake in the former), I hope that my critique of The Science of Sex Appeal will be relevant to you. My goal is that by deconstructing a more obviously and personally problematic *Science* documentary, I can encourage similar deconstructions of other *Science* documentaries that might seem more innocuous on the surface.

Without further ado, let me allow The Science of Sex Appeal to introduce itself. Here is a transcription of the narration that opens the documentary (*italics indicate words emphasized in the actual narration*):

Sexiness: personal preference...or a complex biological equation? A new breed of researcher and a host of human guinea pigs uncover the

surprising—sometimes *shocking*—science of sex appeal. Each to his own, right? *Wrong*. Sex appeal is not a matter of taste; it's a biological imperative. Evolution is driving how we pick partners, and science can prove it. We're hard-wired to read genetic clues in a potential mate's face, body shape and sway, scent, and voice. And it looks as if *women* have an even *more* complex sexual agenda than *men*. (The Science of Sex Appeal)

The visual title sequence, which begins with the announcement of the program's title (and is also used at the head of every clip on the website), features a spinning CGI brain, followed by silhouettes of thin, fine-featured women moving seductively. This is the first of many, many implementations of Plan of Action #5—Utilize colorful, animated computer graphics—in this film. These work with the narration to let us know that we're entering the province of *Science*, and that *Science*'s specialty in the area of sex appeal is *women*. The image track starting at “Each to his own, right?” consists of an attractive woman walking down the street—wearing a tight black cleavage-highlighting dress, fake eyelashes, and high heels—being gawked at by creepy men. And the “new breed of researcher” happens to be a group of three sexy ladies who saunter down the street in form-fitting labcoats. *Science* is now sexy. Yeah, you thought *Science* was male and asexual, right? *Wrong*. It's a sexualized, objectified woman. A sexualized, objectified woman who, over the duration of this *Science* documentary, sexualizes and objectifies women. It's *Science*. The documentary says so.

Now, women and *Science* have had a long and complicated⁸ history, but a viewer would never learn this by watching this program. Historic associations between men and *Science*, men and the mind, women and the body, and so on, might be relevant here. So might the fact that *Scientific* searches for differences between males and females have

⁸ Too complicated, in fact, to be addressed in any real depth in this paper.

historically been intertwined with culture and politics. In their essay on the brain in

Women, Science, and Myth, Patricia Miller and Sue V. Rosser explain:

Scientific research focused on differences between the brains of men and women can be traced back to antiquity...Typically, in an attempt to justify a particular social stance or agenda, the evidence demonstrated that the brains of women were inferior to those of men...The persistent search for brain differences in males and females suggests that society considers such differences important.” (149)

Feminist studies of *Science* have demonstrated “how scientific definitions of women’s ‘nature’ came to justify her exclusion from the public realms of politics and the learned professions” (Schiebinger, “Introduction 4). Londa Schiebinger has written about how early drawings of female skeletons highlighted and exaggerated differences from males and how these differences were in turn used politically to “buttress arguments against women’s participation in the public spheres of government and commerce, science and scholarship” while proving “that women were naturally destined for motherhood, the confined sphere of the hearth and home” (Schiebinger, “Skeletons in the Closet” 26). In her essay “The Birth of Sex Hormones,” Nelly Oudschoorn demonstrates “[h]ow science gives meaning to sex differences is...partly shaped by cultural notions of masculinity and femininity” (113). In the words of Evelyn Fox Keller, “The most immediate issue for a feminist perspective on the natural sciences is the deeply rooted popular mythology that casts objectivity, reason, and mind as male, and subjectivity, feeling, and nature as female” (Keller, Reflections on Gender and Science 7). Closely related is the male-as-active-subject vs. female-as-passive-object binary.⁹ The title of one of Sandra Harding’s

⁹ While this is part of the social construction of science, it is also no stranger to film history. This was famously addressed by Laura Mulvey in her essay “Visual Pleasure and Narrative Cinema”, published in 1975. It has been addressed by many others as well.

books on feminism and *Science* asks Whose Science? Whose Knowledge? Questions of *How?* and *Why?* do abound, but not in this documentary that claims to be an authority on sex appeal (and especially women's sex appeal). Why not?

That the omniscient narrator (recall Plan of Action #3: Deliver information through spoken word of a matter-of-fact, confident narrator) and a good portion of the on-screen *Scientists* (Plan of Action #4: Incorporate on-camera experts (i.e., *Scientists*)) are female is not a coincidence, nor is it a step toward sex/gender equality in *Science* or *Science* documentary. As in other *Science* documentaries, the humanness of the narrator and on-screen *Scientists* is ignored. These Voices of *Science* are here to deliver information and, in this case, to sell a particular variety of *Science*TM: *SexScience*TM. This film is a broadcast documentary and its main purpose, regardless of any loftier claims of educating the masses or spreading the word of *Science* to the world, is to make money. Sex sells. Females talking about sex sells. Very attractive females with attractive voices talking about sex really sells. (Hell, this program itself even says so. It's *Science*.) Questioning *Scientific* objectivity and its objectification of women apparently does not.

The Science of Sex Appeal consists of a series of depictions and descriptions of experiments that basically offer *Scientific* "proof" that the objectification of women is *Scientifically* warranted. A computer program, visually represented by a computer monitor that shows numerical data and human faces covered with numbered *Scientific* data points (Plan of Action #6: Incorporate *Scientific* instruments and the images they produce)—calculates a face's "Attractiveness Score" based on how closely particular features relate to the Golden Ratio (Audrey Hepburn scores a 7.05 out of 10). Another

Scientific experiment proves that women go after men with “deep pockets.” The narrator tells us that one of the scientists in the film has “gathered evidence that women get more *attractive* when they’re ovulating” and that “researchers have put a number on what appears to be the sexiest body shape: her waist should be seven-tenths as wide as her hips.” Here, just like in so many other instances in the film, Plan of Action #1 (Go for simple, clear arguments) and #2 (Incorporate interesting facts) are put into play to *Scientifically* justify woman’s to-be-looked-at-ness that Laura Mulvey criticized in her famous “Visual Pleasure and Narrative Cinema” essay. After all, as the narrator says, “we all operate according to a genetic playbook.”

The sexism in The Science of Sex Appeal also happens to be a racially- and culturally-charged sexism. The film uses *Science* to more or less “prove” white standards of attractiveness. It uses white actors to illustrate sex appeal, and only allows non-whites access to certain types of sex appeal. It uses non-whites, specifically the Hadza people of Tanzania (“*not* typical subjects for a sex appeal study,” the narrator tells us), to study the *Science* of sex appeal as it relates to men’s voices. Then, after giving examples of how non-human males like peacocks and lions are the anatomically flashier sex, the narrator explains, “Human males don’t sport such obvious anatomical adornments, but there’s one thing they *do* have: toys.” As she says this, we see many Hispanic men standing next to bright, flashy cars. Then we hear from a man and woman, both Hispanic, who talk about how these hydraulic-enhanced, shiny cars contribute to a man’s sex appeal. A *Scientist* further relates this behavior to that of non-human animals like big-horned sheep. At another point in the film, an on-camera expert shows us pictures of what she—and

therefore the film and *Science*—refer to as the “average woman” and the “average man” and then explain that they were “made from averaging together 60 different student-aged Caucasian women or men.” The *Scientist* analyzes these pictures to determine facial differences between the sexes. She then applies her newfound knowledge of these differences in her design of subsequent *Scientific* experiments studying attractiveness. That Caucasian faces are used as the control is not addressed in any depth, nor is it presented as at all problematic.

If *Science* and *Science* documentaries are the objective, value-neutral discoverers, holders, and distributors of knowledge that they are made out (or understood) to be, they can’t *possibly* be sexist. Sexism implies things like bias, subjectivity, and discrimination—things that are not allowed in the definition of *Science*. Whatever is addressed in The Science of Sex Appeal must then be *Scientific*, not sexist. Furthermore, sexist attitudes in the realm of the everyday (and in *Science* and in the *Science* documentary) have a *Scientific* basis, and through the magic of circular reasoning, the film immunizes itself against any accusations of sexism.

CONCLUSIONS: TOWARD A NEW *SCIENCE* FILM

I have not intended to present myself as anti-*Science* here, and I hope that I have not done so. *Science* definitely has its merits and has done a lot for the world. But it should be no means be beyond question or reproach. And it is not the be-all and end-all of systems to understand our world. Its problems warrant serious exploration and criticism that need to move beyond the realm of academia and both into fields of *Science* and out to the public arena. Serious re-evaluations of our relationship with *Science* and of how *Science* is constructed are warranted. But if the general public's exposure to *Science* remains limited to *Sciency*-sounding jargon on beauty products (e.g., "amino-peptide complex infused with intracellular fortifier and a touch of precious marine proteins" of Olay's Regenerist Micro-Sculpting Cream, the "powerful combination of cellactive Folic Acid and Creatine to effectively stimulate healthy cell renewal from within" of Nivea Visage's DNAge Cell Renewal Firming Day Care¹⁰), conservative talk show hosts' flagrant misinterpretations and misrepresentations of *Scientific* research¹¹, and this type of *Science* documentary, I worry that the fetishization of *Science* will eventually be replaced by the dismissal of it as unreliable and irrelevant (if that has not already happened). Dismissal of *Science* is an equally problematic alternative to the fetishization of *Science*. Both involve a distancing of *Science* from the general public.

¹⁰ Yes, these are real products. Look next time you're at a supermarket or online or browsing through a fashion magazine.

¹¹ For examples from the shows of Rush Limbaugh, Sean Hannity, Glenn Beck, and Jim Quinn, see "Conservatives repeat inane claim that CO2 [sic] can't be a pollutant because 'we breathe' it" on the Media Matters For America website (<http://mediamatters.org/research/200905210011>)

The re-evaluation and cultural re-construction of *Science* recommended by academic critics of *Science* will hinge on meaningful interaction and engagement, and I believe that a new type of *Science* film could help facilitate this, even if it is only in a small way. I do not presume that a different take on *Science* documentary could single-handedly redefine how society and *Science* interact, but I do see it as a player, however small, that should not be ignored.

Science film is a form of *Science* communication that lends itself to reinvention, to questioning, to experimentation, to change. Peer-reviewed *Scientific* journals are not going to start publishing the *Scientific* equivalents of Gertrude Stein and Ulysses. And while it is doubtful that broadcast entities and educational video companies will risk revenue and audience numbers by opting to showcase and distribute *Science* documentaries that completely break from tradition, festivals and the internet may provide viable avenues through which non-standard *Science* film can reach audiences.

It is time for *Science* documentary to turn to the ignored questions of *Why?* and *How?*. It is time to acknowledge that *Science* does exist in the realm of the human, the personal-political, the cultural. It is time to foster new relationships between *Science*, *Science* documentary, and the cultures of which they are part. It is time to collapse the ideology of distance upon which the *Science* documentary is built.

I purposely do not propose a specific model for a new type of *Science* film because I do not believe that there is—or could or should—be a single magic, all-encompassing formulaic solution. Instead, I propose a new attitude, a new approach predicated on interrelationships, on humility, on empathy, rather than on spectacle,

authority, and distance. I leave you now with a quote from physicist and feminist critic of *Science* Evelyn Fox Keller, herself borrowing the word “ensoul” from artist Marion Milner:

The ultimate descriptive task, for both artists and scientists, is to ‘ensoul’ what one sees, to attribute to it the life one shares with it; one learns by identification. (Keller, A Feeling for the Organism 204)

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