

THE NATURE OF ENERGY: PLURALISM PRACTICES  
APPLIED TO NON-FICTION FILMMAKING

by

Sean Daniel Solowiej

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

Master of Fine Arts

in

Science and Natural History Filmmaking

MONTANA STATE UNIVERSITY  
Bozeman, Montana

June 2012

©COPYRIGHT

by

Sean Daniel Solowiej

2012

All Rights Reserved

APPROVAL

of a thesis submitted by

Sean Daniel Solowiej

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citation, bibliographic style, and consistency and is ready for submission to The Graduate School.

Dennis Aig

Approved for the School of Film and Photography

Dr. Robert Arnold

Approved for The Graduate School

Dr. Carl A. Fox

STATEMENT OF PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a master's degree at Montana State University, I agree that the Library shall make it available to borrowers under rules of the Library.

If I have indicated my intention to copyright this thesis by including a copyright notice page, copying is allowable only for scholarly purposes, consistent with "fair use" as prescribed in the U.S. Copyright Law. Requests for permission for extended quotation from or reproduction of this thesis in whole or in parts may be granted only by the copyright holder.

Sean Daniel Solowiej

June, 2012

TABLE OF CONTENTS

1. INTRODUCTION .....1

2. PLURALISM: THE MOVEMENT .....6

3. THE VALUE OF MULTIPLE PERSPECTIVES IN STORY .....13

4. PLURALISM AND NON-FICTION FILMMAKING .....16

5. CONCLUSION.....22

WORKS CITED .....24



## GLOSSARY OF TERMS

### ACTANT

Any of the participants, human or non-human, performing an act.

### HOLISTIC

Relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts.

### LINEAR THINKING

A process of thought following known cycles or step-by-step progression where a response to a step must be elicited before another step is taken.

### PLURALISM

A diversity of views, standing in opposition to one single approach or method of interpretation.

## ABSTRACT

Traditional scientific methods have depended on a linear system of thought, supposing that one singularly accurate (and therefore correct) explanation exists for any given phenomena, and that the explanation can be arrived at through a prescribed methodical breakdown of its elements involving observation, experimentation and repeatability that dates back to the 17<sup>th</sup> Century.

Regardless of how well an actant works to broaden his or her sources and remain objective, any single point of view is necessarily limited to just that. However many peers sign on to a given perspective, they cannot erase the validity of any other functional perspective. Creative workers in all disciplines, from scientific researchers to authors of literature and narrative filmmakers, have increasingly begun to account for multiple different perspectives in order to create a larger understanding of our world. Successful alternatives to linear thinking have been found that often prove more effective in solving problems and answering important questions.

Non-fiction filmmaking about science has typically mirrored science's traditional process, linearly presenting facts based on other facts through the authority of individual experts. Science filmmaking generally has yet to embrace the comprehensive power available through the inclusion of multiple perspectives. *Pluralism*, the view that multiple methodologies or perspectives are necessary to fully describe the world, is being successfully applied to all areas of study as part of a massive cultural shift toward lateral, big-picture thinking. Non-fiction filmmakers can more effectively communicate big-picture understanding by incorporating multiple different perspectives in their storytelling styles.

## INTRODUCTION

Science has long been considered (since the Enlightenment) the ultimate system of human thought and study. Its style of building a progression of ideas on top of other verified details has secured its reputation as a linear system. Many contemporary research works criticize the limits of the traditional linear scientific study and presentation of facts and promote a more holistic comprehension that accounts for an entire network of influences (Harraway 1991, Latour 1986, Pickering 1995). These works argue the value of including multiple perspectives in any project. This acceptance of diversity is already being applied with great success across the board from fuzzy logic control systems in engineering to interdisciplinary academics (Lyll 2011). While non-fiction filmmakers working to broaden scientific understanding still tend to cling to linear traditions, there is enormous potential value in applying the ideas of pluralism to science and natural history oriented filmmaking.

The BBC series “Planet Earth” (2006), narrated by sir David Attenborough, had the largest budget and viewership of any nature documentary to date. Episode Eight (out of eleven), “Jungles,” explores the jungles and rainforests that make up only three percent of the Earth’s land but are home to more than half of the world’s species. Assuming that one of the major goals of creating this masterwork of filmmaking was to expand viewers’ awareness and appreciation of the Earth’s natural wonders so that they would make future decisions in favor of protecting the planet’s resources from human exploitation, imagine that instead of hearing the authoritative voice of David Attenborough (or in the US version, Sigourney Weaver), we had competing perspectives on each spectacular

location from a few of the major forces that influence each one. In the rainforest jungles for example, we would hear from loggers who feed their struggling families by destroying the ecosystem, from local government officials who are economically motivated to allow this destruction to happen, and from local villagers whose ancestral homes were displaced by logging companies. Having moved from a soliloquy to a conversation, this new film would not be complete without someone from a distant climate whose beach home has been threatened by new weather patterns that are emerging synonymous with the deforestation, nor without a handful of petroleum industry representatives speculatively building roads and drilling for any possible subterranean wealth. And of course, we still represent the charming but threatened tree frog in its current habitat. This proposal seems like a large amount of voices for a single film about the glorious rainforests and jungles. It is.

The topic *jungles* ties the diverse voices together into the subject of the film. Representing a larger picture through multiple perspectives on the jungle creates great opportunities for big-scale viewer enlightenment. It destroys the myth there are still great expanses of perfectly undisturbed natural ecosystems maintaining our eternally intact environmental systems. It tells a more complete story of the tree frog, whose fascinating ability to turn color may soon have to adapt to include machinery yellow when the only scalable structure left to place its sticky-padded toes to is a bulldozer. It tells the viewer in no uncertain terms that the inexpensive fuel that he or she burns popcorn with may be causing environmental and economic ramifications beyond his or her easy monthly gas bills. The viewer begins to consider the diverse meanings of the jungle from viewpoints

both similar to and distinct from his or her own. These ideas combine before the viewer, who in the act of finding his or her own way of sorting them out creates new opinions based on a rounder perspective. The actual *Jungles* episode that was viewed by millions in 2006 speaks of fantastically pristine natural habitats and their relatively untouched inhabitants, appealing to viewers who have already decided they are fascinated by the glory of nature and likely need no converting to conservation interests. Including all these proposed diverse voices in one film can do away with the phenomenon of specially targeting films for divided subgroups within our culture. In other words, it re-opens the conversations between sides, returning us from our distracted bickering to the larger issues we face as a species.

In its current version – not the one we just imagined with multiple perspectives, but the version actually watched by over 9 million viewers, - the “Planet Earth” series is yet another gorgeous presentation of visuals on an amazing collection of shots taken of different environments all around the world. The series employs stunning cinematography with cutting-edge time-lapse and slow motion shots as plants and creatures perform their growth and movements with operatic musical scores, such as a tree frog floating in slow motion through the air in Episode Eight, almost appearing to glow with subtle back-lighting. The viewer’s connection with the Jungle’s native elements is breathtaking throughout the Planet Earth series, and the voice of the narrator serves as a host, guiding us from one exhibit of natural splendor to the next. Some viewers may come away from this with a sense of awe and wonder, others with a renewed priority to protect the planet, depending on their own predisposition prior to

watching it. Relatively few, however, will look up from the film asking themselves broad-scale questions about all of the interacting perspectives affecting these ecosystems today.

While science films may be lagging behind the sciences in the diversification of viewpoints, a few existing social documentary films make strong examples by successfully cross-referencing points of view that would not typically relate to the same idea. These films demonstrate the theory that a combination of unlikely perspectives can be edited to create an effective non-fiction film. Such a film does not merely inspire those feelings that come along with new or superior technical understanding, as a typical linear scientific presentation might. Instead, it actually evokes pathos for ideas themselves while communicating greater understanding of our world's natural systems. This result is not achieved through the simple visceral thrill of watching lava exploding from a volcano or a wild lion killing its prey. Inviting viewers' active minds to compare and cross-reference different perspectives leads to a greater comprehension of an idea than any one focused study could realize.

This paper's application of pluralism to filmmaking focuses on presenting multiple original perspectives within a single work. Research for this study includes the thesis film *The Nature of Energy*. My film explores the concept of energy from diverse perspectives. *The Nature of Energy* aims to show that different points of view with their unique definitions of this broad topic actually benefit one another. The viewer, by exploring and comparing these diverse perspectives, will hopefully interpret energy as larger and more comprehensive than he or she would after studying either of the single

perspectives on their own. This larger understanding of energy can become as meaningful to the layperson as it is to the broader understanding of the specialist in each related field. The goal of *The Nature of Energy* is to affirm that by editing together a diverse variety of sources, the meta subject of the film as encompassed by all sources will gain strength, and by demonstrating its application to particular fields it will also appeal to a wider group of viewers. Fresh styles of storytelling keep audiences better engaged, and changes in scientific thought need to be accompanied by new ways of communicating it to the population.

## PLURALISM: THE MOVEMENT

Within the past thirty years a powerful movement has been increasingly making its way into contemporary thought. It takes a different form in many disciplines, but at the end of the day each one takes on some reflection of the idea of plurality. Academics call it *interdisciplinary learning* (Lyll 2011). To engineers, it's called *fuzzy logic* (McNeill 1994); to anthropologists it's *multiculturalism* (Dietz 2009), and to formal science theorists, *mangling* (Pickering 2005). There are, of course, differences to each approach, but the strong common element among all of these developing new theories is that of pluralism: the acceptance of multiple diverse influences (even apparently contradictory ones) as equally valid and useful.

The greatest instance of pluralism in contemporary cultural thought is the use of the Internet. Web searches in the 1990's were often the topic of much frustration, and received plenty of negative attention in the press for their inaccuracy and tendency to provide more distraction from the sought topic than directly useful information (Lawrence 1999). We had previously been accustomed to finding information directly through a library card-catalog index type system, linearly and with logical intent. The research and discovery process involved first having an idea, and then looking for pre-organized information on that topic. With the advent of early web-based information searches, which relied on cruder word-count and page-hit based algorithms than today's sophisticated search engines, a curious person would go to the web looking for information in support of an idea, and later find that he or she had wandered for hours through a maze of unexpectedly related information. The searcher would have to

personally determine the relative value of each page, only after studying it to some degree. So the minds of web surfers had to suddenly allow for the possibility that *any* given search result or link might have some relevance to their topic of focus. Limits to the scope of an information search had to be self-imposed, and, therefore, consciously acknowledged as a self-limited field of support for the searcher's inspiration.

In short, web searches frustrated linear thinkers to a degree that mandated a shift toward lateral thought. Lateral thinking is the bedrock of pluralism. A web search for a recipe makes a simple example. A Google search for "cornbread recipe" yielded "about 1,800,000 results" in February 2012, the time of this writing. Opening the first three results shows enough variation and similarity between each recipe for a novice cook to quickly understand the basics necessary for baking something that passes as "cornbread." Already the initial goal has been achieved: a recipe for cornbread has been found. But by continuing to compare not only the similarities but also the differences between the endless selection of recipes, it is easy to develop a larger perspective on how cornbread can be modified in different ways to make it sweet and moist, savory and rich, or even "a great custard-like cornbread that can take the place of a stuffing." (Christine 2012)

Regardless of how sophisticated the search-engine algorithms become, or why a given recipe is first or fourteenth on Google's list, the point of interest is that a curious web searcher is presented with an array of options rather than just one 'correct' recipe. The process of deciding which recipe(s) to reference, and which parts of each recipe to cross-reference among one another, moves the searcher into lateral thought.

The ability to cross-reference so many popular recipes makes the expertise that

generally requires years of baking experience relatively quick and easy to access. It is fairly simple to understand the bigger picture by actively comparing the differences among similar recipes. Learning happens fast when the learner's perspective is larger than the context of the immediate problem to be solved. The motive to make one good pan of cornbread combined with the active comparison of differences and similarities among various recipes puts the novice cook into the realm of knowledge that previously took the expert baker years to acquire. Lateral thinking happens much faster with web-based answers to questions, encouraging the novice cook to consider what philosophers might call *cornbread-ness*, the essential qualities that define what it is to be cornbread.

It is interesting to compare lateral thinking to the function of random access memory (RAM) in computer hardware. RAM memory is information storage that is considered volatile (it ceases to exist when the power is removed) as opposed to non-volatile (the information that is continually stored, such as that written on a hard drive). While it is active, RAM memory can be read and over-written many times, as needed by the system's operations. Comparisons of the human mind to computer functions can be useful to build understanding, despite the fact that the latter are more or less crude attempts at replicating a few functions of the former. Consider applying one's mental resources to web browsing for an hour in search of the above cornbread recipe. Now compare that memory use (human brain memory) to that of opening the Betty Crocker Cookbook to the index, locating the correct page for cornbread, and studying the necessary information. The web browsing exercise requires expanding the idea of cornbread to fit many variations. In that process, the first recipe found sets an idea of the

task at hand, along with the aesthetic considerations of how the website presents it, and likely some impressions from some attendant reviews by other web users. Then as other recipes are compared, certain parts of the first one remain, such as the standard ingredients of corn meal and flour, while others become variable like butter or lard, sugar or honey, milk or buttermilk. Oven temperatures may vary but will create an understanding of the range of temperatures in which cornbreads are created: between 350 and 450 degrees Fahrenheit. This constant comparing and re-writing of the recipe in context of the cook's available resources and preferences becomes an active use of memory, much like the use of RAM in a computer system. Reading the Betty Crocker recipe, making sure to shop for exactly the ingredients required, and continually re-making that same cornbread over a lifetime of cooking may yield a fine dish and satisfy a hunger for cornbread. A major difference is that the single-recipe cook's process is not as much a function of active memory but is committed to non-volatile, or more permanent, memory. This technique can arguably be more efficient than having to fully understand cornbread-ness, as long as the resources always remain constant. But when one thing changes, or one ingredient becomes unavailable to the Betty Crocker kitchen, cornbread can simply not be made.

The inherent nature of Internet searching has swayed our cultural thought process dramatically in the direction of lateral thinking, and not a moment too soon. The mounting threats from overdependence on the achievements of narrowly-focused linear scientific progress, such as continually unearthing greater amounts of fossil fuels while evidence mounts that their burning is having a hugely destructive consequence on our

environmental stability are already overtaking our ability to sustain our culture on the planet (Hansen 2008, McKibben 2011). A more lateral consideration of all the associated effects will convince a person that the value of power from fossil fuels is much lower than the value of a stable environment.

The “superposition principle” (Campbell 1987) describes a basic difference between linear and lateral - or “non-linear” (Nicolis 1995) thought in science and mathematics. According to this principle, components of a linear system can be deconstructed and each of their effects studied independently. When their isolated effects are re-combined, the ultimate effect will be no different than the effect of the whole system prior to deconstruction. Non-linear studies find the opposite to be true. Each of a non-linear system’s constituent elements has an effect that, when re-combined, may create unexpected new effects that reflect their cooperation.

There are by now many examples of successful applications of non-linear logic. *Fuzzy logic*, a scientific system of accounting for the value of partial answers (as opposed to working only in quantifiable absolutes), is designed into control systems from high-speed commuter train brakes to rice cookers. The Japanese company Zojirushi sells rice cookers that integrate fuzzy logic circuitry to sense the rice’s condition as it cooks and make adjustments as necessary. A typical (linear-process) rice cooker will simply turn on with a switch, rise to the programmed temperature, and remain on for the factory-determined duration. Regardless of variable factors that affect the cooking such as the type or volume of the rice, or the altitude of the location, the linear rice cooker blithely performs its duty with no concern for mitigating influences. The fuzzy logic cooker,

while its exact process for each batch of rice cannot be predicted at the factory, consistently delivers ideally cooked rice in a variety of conditions.

The social sciences have long been in the habit of finding answers to their questions through statistical survey work. These answers are often attacked as being scientifically disputable, not only because of the many opportunities for bias in collection or interpretation methods to skew statistical results but also because survey data is limited to most strongly representing a majority opinion or result. However large the sample size for collected data, this argument goes, accurately repeating a survey can potentially return different results every time. This is known as the *replication fallacy* (Gigerenzer 1993). But the data are nevertheless extremely useful. By understanding broad tendencies in behavior, predictions based on statistical data can be made within a certain degree of likelihood to be accurate (Abelson, 1995). This level of accuracy is enough to justify large-scale decisions. Statistical mathematics serves as another strong example of the sciences' early acceptance of lateral, pluralistic thought processes, and a willingness to find value in partial answers. Despite surveys not being absolute in basic linear mathematical application, they are nevertheless ~~extremely~~ useful in accounting for multiple varying perspectives.

The simultaneous rise of social (or “soft”) sciences with the appearance of pluralism is no mere coincidence. If the mechanized, industrial-scale destruction of World War II or the wholesale corporate takeover of world resource management today represents linear thinking at its most effective, the original ideas behind the development of the United Nations or Internet-circulated petitions of protest are our lateral responses.

Our cultural foray into strict linear scientism may have been necessary at one point, both to develop rational technologies and to escape the abusive social controls of a faith-based hierarchy prior to the Enlightenment. Today, however, linear scientism is also readily abused by those seeking power, and science's built-in capacity to ignore entire segments of the world that it affects makes it as dangerous and questionable as any state religion (Kitcher 1983). Our recent cultural redirection toward the lateral has been justifiably making its way into every field, from politics to the sciences to storytelling; proving the value of accounting for diversity.

## THE VALUE OF MULTIPLE PERSPECTIVES IN STORY

Story is the vehicle that presents lessons to communicate cultural understanding and attitudes (Michaels 2011). A story is typically biased by its teller through the selection of the story structure and embellishment or omission of details and style in order to present a perspective in accordance with the teller's preferred shaping of the listener's understanding. This shaping is unavoidable, as any teller necessarily has a particular point of view. The listener or viewer enters into that perspective and conforms to the message at least deeply enough to determine his or her own interest in it. Whether or not the listener agrees with the content of the message, the process of receiving it begins with some degree of conformity and acceptance.

The film *Pulp Fiction* (1994) received tremendous attention for its style of non-linear storytelling. Chronology was not, however, the defining detail of the film. The interweaving of multiple perspectives, building a complex and simultaneous story among a group of radically different characters, created for the viewer a grander vision of the world at large. It forged a felt understanding that while one person experienced falling in love with a dangerously married woman, another was standing up to intimidation by an organized crime leader, while yet another was building toward a major shift in career and worldview. These sub-stories tie together in fascinating ways, and it is the viewer's ability to have omniscient perspective on the characters' interactions while also engaging in the individual dramas that create a sense of wonder and realization. *Pulp Fiction* was a huge box office success, as many multi-protagonist narrative films before it have been throughout film history. From Edmund Goulding's

*Grand Hotel* (1932) to Robert Altman's films *Mash* (1970), *Shortcuts* (1993), and *A Prairie Home Companion* (2006), among many others, narrative film has often embraced the power of multiple perspectives (Azcona 2010).

Multiple perspectives have also long been used in literature to great success as well. William Faulkner's *As I Lay Dying* (1930), told in alternating chapters from fifteen voices in and around the Bundren family, is recognized among the great classics of American literature. The reader's composite view illuminates the culture that this family is operating in, inviting critical thinking about the wisdom of limiting ourselves to contextual definitions. Presenting multiple tellers of a story offers an escape from the trappings of a single perspective while still accounting for the personal validity of each one. It is easy to argue that in a given media work comprised of multiple perspectives, there is still an entity who decides what story or stories will be told, and who also selects which storytellers will present them. Thus bias in story always remains present. The interest of this paper is not that of eliminating perspective, but expanding it.

The process of engaging multiple perspectives on a theme and considering each point of view's similarities and differences quickly yields a mature understanding, like cross-referencing cornbread recipes. This larger perspective does not instantly make everyone a great filmmaker, storyteller or baker, but it does expand the perspective and critical thought process of each active viewer. The more a storyteller can include diverse perspectives, and the more distinct those perspectives are at the onset of the story, the greater the potential to weave a macro vision that illuminates and expands the

viewer's awareness. Fiction storytelling has already figured this out to great success. As

Maria Del Mar Azcona writes in *The Multi-Protagonist Film* (2010, p. 123):

In the increasingly globalized world of the twenty-first century, the network logic has transformed all the spheres of economic, political, and social life. The world has become a smaller place where unexpected links between remote parts of the globe have turned it into a dense web of direct and indirect connections. In the increasingly globalized world of the twenty-first century, the network logic has transformed all the spheres of economic, political, and social life. The world has become a smaller place where unexpected links between remote parts of the globe have turned it into a dense web of direct and indirect connections.

## PLURALISM AND NON-FICTION FILMMAKING

The same movement to override the limits of linear scientific thought and to tell comprehensive stories applies equally well to break the stagnation of traditional science and natural history filmmaking. Many documentaries make use of multiple interviews to represent different sides of an issue, much like journalism. But pluralism in non-fiction filmmaking is more than the stacking of multiple expert voices. Pluralism is determined not by a head count but by the breadth of the perspectives that are brought together to weave the bigger-picture understanding. Apparent discrepancies between perspectives create questions in a viewer's mind as to how each perspective could possibly relate to one another. As seasoned film and television viewers, we believe that the inclusion of multiple elements in a film signals their relatedness to each other. If the relationship between them is not obvious, we will actively be looking for ways to construct it, consciously or subconsciously, even after the film has ended.

Watching Godard's *Breathless* (1960), viewers leaned across each other's seats trying to see around a pillar that was framed in a shot partially blocking the view of a character (Duckworth 2011). This "dirty frame" technique quickly found common usage as a visual tool in all genres of filmmaking, as it draws viewers into further engagement in the film space by challenging them to create the missing elements for themselves. Content pluralism in film can work in a similar way. Enticing viewers to draw their own links between obscured elements challenges them to realize that a larger theme may exist among apparently disparate topics. This serves to counteract our cultural training to accept the absolute authority in linear fields of specialty, and instead start thinking more

holistically about how all of our specialized knowledge fits together, and what we might be able to do with it for the bigger picture of living on this planet. This must be the ultimate goal of any science or natural history filmmaker working today.

At least a couple of good examples already exist of non-fiction science film's successful use of pluralism. Errol Morris's documentary film *Fast, Cheap, & Out of Control* (1997) edited together an elderly topiary gardener, a retired lion tamer, a man fascinated by naked mole rats, and a cutting-edge robotics designer. The different stories are introduced one at a time. As soon as the viewer begins to understand each one, apparently natural transitions are edited between the stories until they seem to start talking to one another. This interplay among such disparate specialties has the viewer actively looking for connections, zooming out to a grander scale that can accommodate such differences. *Fast, Cheap and Out of Control* is easy to classify as a science film, following the work of dedicated practitioners of focused specialties (horticulturalist, animal trainer, entomologist, and artificial intelligence designer). But unlike a more linearly structured film exploring the life work of any one of these fascinating characters, Morris's film uses each of them to contribute to a greater holistic understanding of mankind's pursuit (rather than one man's). Viewers still learn about science from each character, but are simultaneously developing their story on a meta scale. Morris's intercutting between naked mole rats and artificial intelligence, a lion tamer and man sculpting dangerous wild beasts out of shrubbery, melds these pursuits together to evoke feelings that are common to each subject: man's struggles with understanding and controlling life, death, and human nature.

Jessica Yu's documentary film *Protagonist* (2006) is equally encouraging.

*Protagonist* explores four very different men through major developmental struggles that each of them faced. A gentle, bullied boy turned martial arts expert, an abused boy turned violent criminal, a homosexual priest alternately renouncing his conflicting sides, and a boy who was the child of a Holocaust survivor mother and a Nazi father turned political terrorist are all edited together. The editing makes use of interstitial puppet shows enacting the chorus component from the classic dramatic structure established by the ancient Greek playwright Euripides.

It is challenging to summarize the breadth of effects this documentary has on the viewer. Where Morris's film shows us the power of pluralism through the story of men's work in the traditional sciences, Yu's applies to the social sciences as she exposes factors in their personal character development. In the stories of each man, it seems clear that we are studying differences in how people react to the events in their youth. Each of the four boys experienced early trauma, then reacted by embracing or denying the offending element in their lives. Each continued living according to their reactionary development even after the original threat was gone, until at last each man realized some level of wisdom and analytical understanding of his own process. This collective string of stories is enough to build a viewer's ideas about psychological development and choices, psychology of abuse, and identity creation in a far more compelling story form than the rote presentation of these same ideas from an expert psychologist. Furthermore, editing the film together in the structure of a Greek play, together with the puppet chorus, has the effect of likening our dramas today with those going on thousands of years ago. This

gives viewers the feeling that little about human nature has fundamentally changed in that time, despite our obsession with modernity and progress. So Yu's non-fiction film *Protagonist* helps prove the enormous qualitative value of pluralism in story above the straight presentation of expert testimony.

Aardman Animation's animated natural history film *Creature Comforts* (1989) uses pluralism in its presentation of life for animals within a zoo. It does so visually through the perspectives of many animals in their cages, and also subtly through the perspective of many humans by using on-the-street interviews with people as the voices of the animals. This creates an overlap of empathy for the viewer, who feels pathos both for the tired, captive creatures in the zoo and for the people whose voices describe their own feelings in a manner that could be so fitting for caged animals.

This paper's attendant documentary film *The Nature of Energy* does not intend to wholly prove by its own merits the necessity of converting all future science and natural history films to pluralist perspectives. As an individually funded and produced short student film, *The Nature of Energy* is intended to serve as both example and experiment in the prescribed style. In it two people are chosen to represent divergent views on the term energy. One is an Ayurvedic Nutritionist, the other a Sustainable Architect. Each presents his and her theories on how energy exists and moves, both in broad scale and relative to their own fields of specialty. It is easy to notice that even when talking about energy's meta definition, each participant strongly colors their ideas in the direction of his or her own particular interest. This should ideally be both an "of course" moment for viewers who consider it, and an insight to the inherent bias of expert presentations. The

viewer's next step, which is to give equal respect to different perspectives on a given subject, may come readily while the viewer is piecing together themes throughout the film. By the end of this film, it is hoped that the viewer's understanding of the topic is not weakened by seeing it spread thin across different ideologies but strengthened by surviving intact these plural, seemingly contradictory applications. If the experimental student film is a success, those commonalities between the perspectives will help to define energy in general, just as those differences between the perspectives will hint at the fullness of all that the term can represent.

Typical linear documentary films dealing with energy have presented one perspective in an effort to convince viewers of one particular argument. In the 1957 educational film *Living With the Atom*, an authoritative man tells viewers about the energy that is stored in mass, and ultimately about our moral responsibility handling the newly realized power of atomic energy. *Gasland* (2010) is typical of a contemporary non-fiction film about energy, dealing with exposing the economically motivated politics that further environmentally destructive behavior. Between these two common examples, we see little semblance between the topics other than the ultimate subject of energy, more of which is taken for granted as a necessity for our cultural direction. Both documentaries present their perspectives on energy in fairly narrow definitions that can easily label them as linear science films.

The greater scope that the pluralistic film brings to viewers encourages them to consider bigger questions that we have traditionally taken for granted. Viewers may ask themselves why we require so much energy production, what it actually is used for that is

so necessary that we continually kill for it, and whether there are other ways of fulfilling these needs without so much destructive energy production. There are many hopeful results from this type of thought expansion in the viewer, starting with that act of expansion itself, which is a powerful tool for considering the possible value of new ideas that may differ from the viewer's idea of normal. Another is a meta-scale consideration of the film's topic (in this case, the term energy) when it is encountered in future contexts, leading away from panic at media presentations about our growing energy demands, and toward a new concept of need. Once this mental shift has been made, it is not overly idealistic to suppose that many viewers will start to expand their thinking on other subjects to be more inclusive and holistic. The first act of thinking pluralistically, even if it is only to figure out how to follow a particular film plot, creates those thought patterns that can be used again to accept pluralism as a resource in future problem solving.

## CONCLUSION

A return to the questions this paper was formed to address puts us in the happy position of affirming the posed thesis: That, in fact, differentiating sources on a topic or theme can help to create a more broad, holistic understanding. Diversifying voices in science and natural history filmmaking content can help to create a strong holistic understanding of a complex topic without requiring viewers to plumb the linear depths of formal detailed studies. The ideas of energy discussed in interview footage for *The Nature of Energy* both feed one another and collectively expand the boundaries of the definition of energy. As more science and natural history films begin to include multiple diverse perspectives on their chosen topic, the perspective of viewers will increase to consider many new and broad-ranging implications.

The expansion of human culture's understanding of and respectful appreciation for the delicately balanced systems of our natural world is a primary concern to those who dedicate their life energies to creating films on science and natural history. Simply preaching the necessity of conservation will mostly reach an audience of conservationists. Simply entertaining with glorious visceral representations of the natural world outside of humankind's influence (making films that are often derisively labeled "green porn") reaches only the crowd who allow themselves to take such inspiration, and has the potential to deepen the divide between those who demand protection of the environment and those who insist that it is a resource for exploitation. By including a more holistic range of perspectives, science and natural history filmmakers have the opportunity to help open public consciousness to include both the need to use natural resources

responsibly and the importance of maintaining the planet's systems intact. Respect for our world's ecosystems cannot overshadow our own needs for survival any more than our definition of "need" cannot impose too heavily on the world's ability to sustain. Only by representing all sides of a story can the wisdom of seeing big-picture be distributed.

## WORKS CITED

Abelson, Robert P. *Statistics as Principled Argument*. Florence: Psychology Press, 1995. P. 75.

Allrecipes.com. Christine L.: Fresh Corn Spoon Bread, February 2012.  
<<http://allrecipes.com/Recipe/Fresh-Corn-Spoon-Bread/Detail.aspx>>

Azcona, Maria Del Mar. *The Multi-Protagonist Film*. West Sussex: Wiley-Blackwell, 2010.

(Campbell, David K. "Nonlinear Science: From Paradigms to Practicalities." Los Alamos Science Special Issue. Los Alamos: Los Alamos Science, 1987)

Deitz, Gunther and Neumann, Ursula and Weisse, Wolfram. *Multiculturalism, Interculturality and Diversity in Education: An Anthropological Approach*. Germany: Waxmann Verlag GmbH, 2009

Duckworth, A.R.: *Dislocation and (Mis)communication in Jean-Luc Godard's Detective*, March 2012. <<http://ardfilmjournal.wordpress.com/tag/jean-luc-godard/>>

Gigerenzer, Gerd. "The superego, the ego, and the id in statistical reasoning." A Handbook for data analysis in the behavioral sciences: Methodological issues. Eds. Keren, Gideon; Lewis, Charles. Hillsdale: L. Erlbaum Associates, 1993. P. 311–339.

Hansen, James; et al. "Earth's Energy Imbalance: Confirmation and Implications". *Science* 308 (5727): 2008 P. 1431–1435.

Harraway, Donna. "Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century". *Simians, Cyborgs and Women: The Reinvention of Nature*. New York: Routledge, 1991. P. 32.

Kitcher, Philip. *Abusing Science: The Case Against Creationism*. Cambridge: The MIT Press, 1983.

Latour, Bruno, and Woolgar, Steve. *Laboratory Life: The Construction of Scientific Facts*. Princeton: Princeton University Press, 1986.

Lawrence, Steve; Giles, Lee. "Accessibility of information on the web". *Nature* 400 (6740): 1999. P. 107–9.

Lyall, Catherine et al. *Interdisciplinary Research Journeys: Practical Strategies for Capturing Creativity*. New York: Bloomsbury USA, 2011.

McKibben, Bill. *Eaarth*. New York: St. Martin's Press, 2011.

Mcneill, Daniel. *Fuzzy Logic: The Revolutionary Computer Technology That Is Changing Our World*. New York: Simon & Schuster, 1994.

Michaels, F. S. *Monoculture: How One Story Is Changing Everything*. Kamloops: Red Clover, 2011.

Nicolis, G. *Introduction to Nonlinear Science*. Cambridge: Cambridge University Press, 1995

Pickering, Andrew. *The Mangle of Practice*. Chicago: University of Chicago Press, 1995.