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Gore's Science The Kairos Of An Inconvenient Truth And The Implications For Science Writing

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GORE'S SCIENCE: THE KAIROS OF *AN INCONVENIENT TRUTH* AND THE IMPLICATIONS FOR SCIENCE WRITING

by

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ABSTRACT

Modern Americans are exposed to scientific and technical information on a daily basis that urges them to react as well as learn about new ideas. The popular science writing that circulates this information must be portrayed in a way that makes it easy for lay people to understand complicated ideas while at the same time remaining complex enough to convince readers that the information is reliable, accurate, and worth learning. In making decisions about how to accomplish this balancing act, science writers make decisions that influence the audience's opinion about new scientific ideas, how easily the audience will accept or reject these ideas, and how the audience will react to the new information. In order to be as influential as possible on their audience, science writers must take full advantage of rhetorical *kairos,* or opportune timing. For this, they must keep in mind not only the chronological time and physical space, but issues including political maneuverings, society's morals, popular culture, and a myriad of other considerations. Any text must be influenced by the *kairos* that exists both before the text is created and during the presentation. In addition, each text helps create a new *kairos* for texts that come after. This is especially true in the field of popular science writing. Al Gore's *An Inconvenient Truth* is a useful text for analysis of this process, as he portrays scientific information to a lay audience in order to promote acceptance of a controversial idea and to encourage action based on that acceptance. Because he is working on a delicate topic for the time, Gore had to rely heavily on the *kairos* of the moments before and during his presentations, and he created a fertile *kairos* for continuation of the environmental discussion.

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CHAPTER 1: INTRODUCTION

The green conversation is one that today saturates nearly every aspect of American society. Apartments boast that they provide a green lifestyle. Businesses proclaim that their buildings are LEED (Leadership in Energy and Environmental Designs ["LEED"]) certified. Colleges list their recycling practices in recruitment material. Chain stores offer environmentally friendly packaging on items from t-shirts and granola bars to music CDs and children's toys. Hybrid cars are a common sight, and some auto companies are beginning to offer fully electric cars that can be charged at home or at public charging stations, all in the name of "going green" and saving the planet. The topic is so prevalent that it has nearly become an essential aspect of American culture. Although climate change and environmentalism had already been topics of discussion among the scientific community and among select members of the public in the past, the recent boom of interest has moved the conversation into the mainstream. Additionally, worries about threatening changes in nature such as strengthening hurricanes and melting polar ice caps, as well as environmental disasters like the 2010 BP Deepwater Horizon oil spill and the 2011 Japanese tsunami have fueled the discussion even further. But at what point did the American public take on this topic as one of such all-encompassing proportions?

One name irrevocably linked to the green conversation is Al Gore. Whether they agree or disagree with his premise and whether they've seen the show, read the book, or done neither, most Americans are aware of Gore's documentary *An Inconvenient Truth* (AIT) and of the impact it has had on the environmental

discussion. Although environmentalism had been a public topic for decades in 2006 when AIT was released, it still had a tendency to remain in specialized science or social communities with a limited amount of influence in the general public. While his conclusions have been debated, Gore effectively moved the conversation from the realm of the specialized to the world of society at large, paving the way for the environmentalism fervor that has gripped the country. His rhetorical style made information that had previously been reserved for those with specialized knowledge or those socially connected to specific interests groups available to anyone willing to listen (or read), and the *kairotic* situation gave his argument the power it needed to gain the widespread attention that made it so influential.

In this thesis, I will analyze Gore's work rhetorically through the lens of *kairos*. Defined in simple terms as the proper time and place for a text to have the greatest effect, this concept in fact encompasses the entire rhetorical situation. It pulls together all the aspects that a text responds to, including chronological time and placement, audience, media type, politics, physical location, previous scholarship, current conversations, trends, moods, contemporary culture—in short, everything that could possibly influence the success or failure of a communication. It influences all aspects of a piece's creation and performance, including decisions such as genre, appeals, style, and more. This all-encompassing nature of *kairos* makes it a powerful tool, and analyzing texts that have successfully taken advantage of this concept can help us understand why some works, including AIT, have had

such a widespread impact and prompted such strong reactions, both positive and negative, to the text.

Through this analysis I will draw conclusions about other science writing texts. In this paper, science writing will refer to texts about science whose audience is the lay public rather than those in scientific fields. These conclusions will be *kairos*-centered, focusing on how *kairos* works within (and outside) any science writing text to influence the success of that text. These conclusions will be informed by Debra Hawhee's idea of "invention-in-the-middle," which describes not only how the rhetor and audience participate to create one *kairotic* moment with one text to fulfill that moment, but how the created text in turns acts to change the rhetor and audience in such a way that new *kairotic* moments are created, forming a cycle of influence, creation, adjustment, and new influence.

Chapter 2 is a literature review that explores existing scholarship on *kairos* and invention, as well as the relationship between scientific and science texts and rhetoric. I discuss the "rebirth" of *kairos* scholarship and the subsequent studies that took place as a result. I also begin to discuss the concept that Debra Hawhee has termed "invention-in-the-middle," where each text is seen as being the sum of a series of rhetorical movements that create a discussion at the same time that they create the rhetor. These movements are influenced by the *kairotic* characteristics of each moment as it is encountered, including the rhetor's and audience's reactions to each other. Next, I discuss the rhetoric of science and its characteristics, including the adjustments that happen when a text moves from scientific writing for a specific

group to science writing meant for a large, public audience. I conclude the chapter with a discussion of previous scholarship on *kairos* in science writing, including authors who discuss the vital nature of this concept in the field of science-based communications, both when analyzing and when creating texts.

Chapter 3 covers the green conversation leading up to Gore's text, including the foundational influence of Rachel Carson's *Silent Spring* on the public discussion of environmentalism and the adjustments made to the conversation in the decades leading up to AIT. I look at the methods traditionally used in environmentalist and green literature and their effects on the intended audience before focusing on Gore and his appropriation of these methods for the book version of AIT as well as the additional rhetorical methods he employs in the film. Finally, I define AIT as not only a political, but a science-based document.

Chapter 4 is an in-depth analysis of the print and video versions of the text and their utilization and creation of *kairos*. In it, I focus on how Gore invented his text in response to a specific *kairos* and how the text in turn created a new *kairos* for further discussion to take place in the field of environmentalism. I look at impacts from political, social, and natural-world angles and show how Gore was able to capitalize on the situation created by policy, public opinion, and environmental changes leading up to his presentation. In this chapter I also discuss the text as invention-in-the-middle, wherein Gore not only creates one static text in response to a moment in the large-scale rhetorical landscape, but actually creates the text and is created as a rhetor based on the movement between *kairotic* moments within the

text itself (Hawhee). Finally, I consider the *kairos* created by AIT that allowed others to take advantage of the renewed interest in climate change and the environmental movement.

In chapter 5, I consider the implications of this analysis of AIT on the genre of science writing in general and begin to draw conclusions about how science texts interact with the rhetorical and *kairotic* situations in which they occur. By looking at the tactics Gore utilizes in AIT and comparing them to current science writing, I draw conclusions about how successful science writers use the multifaceted elements of the *kairos* available to them in order to gain a supportive audience. By applying elements of Jeanne Fahnestock's and Dorothy Nelkin's theories about science writing to Gore and to examples from recent science writing, including articles from popular science publications such as *Scientific American, Popular Science,* and *New Scientist,* I analyze current strategies in science writing and discuss the effects these tactics may have on scientific and technological developments, on popular culture and politics, and on future science writing.

In Chapter 6, I discuss pedagogical applications of the sort of in-depth analysis presented here and its value in a college writing course. Focusing on science writing will allow students to learn analysis with a complex, multi-leveled genre while providing them with a topic that is familiar, ever-present, and imperative, especially in today's technology- and science-driven society. As a lens, *kairos* provides students the opportunity to analyze texts from multiple positions and viewpoints, as it not only requires an understanding of the traditionally-studied

rhetorical appeals of *ethos, pathos,* and *logos*, but also of the complex rhetoric- and community-based situations that affect the success of any text. This will demonstrate to students the complex interactions that happen between members of a discourse community and how texts act both as a reaction and prompt within that community. In addition, looking at a text's place within the context of *kairos* will allow students to gain an understanding of audience analysis as they look at how the information from a closed community may be adjusted when the conversation enters a different community. Studying a relatable, vital field through a complex lens can help students grasp the complex nature of rhetorical moves while keeping them personally invested in the topic.

Chapter 7 is a conclusion, reviewing the arguments presented and reinforcing the conclusions made earlier. In this chapter, I will discuss the implications of this type of research and suggest further research that could be done both in this subject as well as where this type of research may be applied in other research areas.

In this research, I focus on the *kairos* that made AIT so powerful as a rhetorical piece. By analyzing Gore's work rhetorically, I hope to provide a lens through which to view other documents in the field of science writing. I will attempt to show that finding and responding to the opportune *kairotic* moment is an essential element for successful science writing and that consideration of these moments must be shown not only before and after a text's creation, but during creation itself, as rhetor and audience interact. As Gore's text demonstrates, all

science-based writing not only responds to a *kairotic* moment, but creates new *kairotic* moments that both the original piece and other texts must respond to, allowing conversations and progress in the field to continue.

CHAPTER 2: LITERATURE REVIEW: RHETORIC, SCIENCE, AND THE RHETORIC OF SCIENCE

In visual depictions, the god Kairos embodies the concept of taking advantage of the perfect moment. He is shown with wings on his feet and/or back, showing his fleeting nature; a hairstyle that is long in front and bald in back, signifying the importance of grabbing him before he passes by; and various accessories, from butterflies to razors to scales, symbolizing his precarious and ever-shifting nature (Hawhee 20, 24). The rhetorical *kairos* that this figure physically represents can be seen as the right time, place, and situation for a rhetorical action to occur and is essential to any particular rhetorical situation, especially in scientific and science rhetoric.

Kairos and "Invention-in-the-Middle"

Debra Hawhee describes *kairos* as "a particular rhetorical moment" which "marks the opportunity for a subject to produce discourse" (18). However, she is careful to note that "*kairos* marks quality of time rather than time's quantity," with the more familiar *chronos* signifying linear time in the sense of hours, days, or years (Hawhee 18). *Kairos* suggests not only chronological time, but an entire rhetorical situation—including any range of variables such as place, audience, politics, previous arguments, or mood—that provides an opportunity for effective rhetoric. Put another way, *kairos* is "a combination of 'opportunity' and 'due measure'" (Schnackenberg v), where a rhetor is able to communicate what is needed where it

is needed and when it is needed. Charles Bazerman hints at the depth of the concept, stating that *kairos* is "loosely translated as rhetorical moment" but has a "rich and complex meaning embodying interests and ethics, practicality and aesthetics, intentions and context, self-assertion and propriety, citizen and polis, human and divine" ("Whose Moment?" 171-72). *Kairos* depends on everything surrounding an action, including "time as well as politics, social belief, communal attitudes and goals, personalities, and events" (Bazerman, "Whose Moment?" 173).

Until fairly recently, *kairos* did not seem to receive extensive attention, especially in comparison to its rhetorical counterparts: *ethos, pathos* and *logos*. In 1983 at the Conference on Classical Rhetoric and the Teaching of Freshman Composition, James P. Kinneavy put out a call for further research into the concept (Schnackenberg 5). Since then, more scholars have focused on *kairos*. Authors like Sharon Crowley and Debra Hawhee incorporate *kairos* into textbooks and class studies, and many PhD dissertations since Kinneavy's call have focused on this topic exclusively, including Matthew W. Schnackenberg's 2006 dissertation, "Capturing *Kairos*: A Theory of Rhetorical Cunning."

Schnackenberg provides an in-depth look at the concept, discussing it through both ancient and contemporary views and claiming that all "rhetoric is concerned with capturing *kairos*" in the sense that all rhetoric must happen during the proper time and situation and in the right place to have the desired effect (6). He says that although *kairos* is difficult to theorize and nearly impossible to clearly define because of the many ways of interpreting the term, he agrees with Phillip

Sipiora that *kairos*, like *logos*, is a "master concept" of rhetoric that can be applied across disciplines, ages, and cultures (14-15). The difficulty in studying *kairos* comes from the fact that there is no simple, one-to-one translation of the concept and from the issue that exploring *kairos* is a complicated and complex study that does not always have a discernable stopping point (23, 21). However, this is a large part of what makes *kairos* so important to rhetorical analysis. The vital, universal application of the concept combined with its complicated, all-encompassing nature provide a rich, full understanding of a text that simply may not be attainable without this form of investigation.

Expanding on one of the unlimited facets of *kairos*, in the chapter of *Constructing Experience* "Whose Moment? The *Kairotics* of Intersubjectivity," Bazerman discusses the dependency of *kairos* on social considerations. He says that although classical *kairos* focuses on the individual rhetor and his or her personal place in and view of society, the rhetor's personal position is bound by societal constraints ("Whose Moment?" 174). Therefore, it is vital to acknowledge that *kairos* depends not only on the rhetor, but on "all participants, their conceptual frameworks, and the relationships and transactions among them" ("Whose Moment?" 174). This society-focused view of *kairos* becomes much more encompassing than the individually-focused view. It leads us to recognize that "*kairos* extends beyond identifying our moments of private advantage… to participating within the communal moments that draw together the larger communities we are part of" ("Whose Moment?" 186). These communities may be

as small as the rhetor and a one-person audience or as inclusive as the population of the entire world. Any rhetorical situation and the resulting action(s) must take into account not only the rhetor's perceptions of the world, but countless variables that make up the entire reality in which rhetoric occurs.

As a vital component of any rhetoric, *kairos* is closely linked with other rhetorical qualities. In her article "In[ter]vention: Locating Rhetoric's *Ethos*," Judy Holiday shows the connection of *kairos* to *ethos,* or appeal based on a rhetor's character (389). In a similar argument to Hawhee's discussion of *kairos*, Burke LeFevre writes that *ethos* is not an isolated quality, but rather "arises from the relationship between the individual and the community" (qtd. In Holiday 389).

Holiday explains that *doxa*, or assumptions about how reality works (for example, the internalization of how time is supposed to act and how to tell time), create social norms and practices (391). The rhetor who draws on these *doxa* not only uses them to create a particular *ethos*, but also to understand the nature of the *kairotic* moment based on the current beliefs of a particular audience. Rhetors, as part of the invention process, tend to go through "a process of selection that rules out certain possibilities, and realizes others" (Butler, qtd. In Holiday 395). This process of elimination occurs through ethics, politics, and other situational variables, which all take part in forming the *kairos* of a particular piece of rhetoric. As Holiday says, "all discourse is …malleable to situation" (394).

There is no realm where a rhetorical situation is isolated from the rest of reality. All the parties involved, including the rhetor and the audience, "are

constrained by their own assumptions, beliefs, and values and are thus incapable of acting without interest" (Holiday 397). Holiday ties this directly to *ethos* and ethics, reminding us that these outside interests help give rhetors their authority as well as influence the morality or ethical dimension of any particular piece of rhetoric. They are closely tied to the "specific situation" in which rhetoric occurs (Holiday 400). The immediate relation of *ethos*/ethics and *kairos* plays an important part when analyzing communications that happen on a mass scale, either in a professional community or with the general public.

In her article "Kairotic Encounters," Hawhee connects *kairos* not only with the rhetor, but with all participants in a rhetorical situation, with the audience as a central point of creation of the rhetorical prompt for invention at a particular time. She suggests that by its nature, *kairos* prompts what she calls "invention-in-the-middle," which links prompt and creation to performance and reaction (Hawhee 17-18). A topic is neither discovered nor created, but rather the rhetor responds to an existing situation by inventing rhetoric and by, in turn, being invented as a rhetor. He or she "invents and is invented … writes and is written, constitutes and is constituted" (Hawhee 18).

In this state of constant, evolving invention, the rhetor and the audience participate together in the act of creation and in being created. The audience participates in the *kairotic* moment by prompting the creation of the topic and, as a result, the creation of the rhetor, who takes on the nature of rhetor in reaction to the prompt for invention. As the rhetor invents and the audience reacts, they are both

changed by the rhetoric and re-created into, essentially, a new audience and a new rhetor. Thus new situations are formed and new *kairotic* moments are made, prompting more invention. In this way, discourse becomes movement from one *kairotic* moment to another, a "turning" that "transforms" both the rhetor and the audience (Hawhee 23). Invention-in-the-middle, therefore, has the effect not of creating a closed system of prompt and response, but rather creates connections between different discourses and moments, where *kairos* "goes 'between' … the outside of the self … and the discourse or the 'other,'" providing the connections that effective rhetoric requires between not only two moments (before and after), but between a number of ever-changing rhetorical moments (Hawhee 24-25). The *kairos* at play here is not simply a description of a rhetorical situation, but rather becomes an integral part of it, making the rhetorical situation nonexistent without the kairotic element.

The Rhetoric of Science

The rhetoric of science field sprouted fairly recently and has grown tremendously. In his book *Starring the Text: The Place of Rhetoric in Science Studies* (a remake of his earlier *The Rhetoric of Science*), Alan G. Gross says that while much rhetorical analysis has focused on science itself, he focuses on the texts produced during the course of scientific research, including Newton's *Opticks* and Darwin's *Origin* (5). Some scholars have continued analyzing science rhetorically, while others have followed Gross's model of analyzing scientific texts. Among those focusing on texts is Michael S. Halloran, who in his article "The Birth of Molecular

Biology: An Essay in the Rhetorical Criticism of Scientific Discourse," analyzed Watson and Crick's landmark *Nature* article "Molecular Structure of Nucleic Acids," offering insights on how their rhetorical skills gave them the edge to win the Nobel Prize and go down in popular history as the discoverers of the structure of DNA. In "The Dominance of Scientific Discourse: Theoretical Contexts," Michael J. Zerbe analyzes the construction of communications in general that are allowed the title "scientific discourse," including the structure of the argument, the authority of the form in modern days, and the rhetorical *kairos* of their creation.

Rhetorical adjustments occur when information goes from scientific writing to science writing, or, in other words, when it is transferred from writing for professional scientists to writing for public consumption. In "Accommodating Science: The Rhetorical Life of Scientific Facts," Jeanne Fahnestock looks at the change that takes place in science communication when it undergoes this shift. She especially argues that changes can be accounted for and explained through defining a genre shift between audiences, from forensic oratory in the case of scientific articles to epideictic (celebratory) oratory in the case of popular scientific journalism (Fahnestock 278).

Determining how to present the information becomes an issue not only of translating jargon, but of deciding what is important for the particular audience (Fahnestock 280). Where an article written for scientists is meant to persuade the audience to accept the argument as truth, an article written for the general public is meant to inform, entertain, and reassure. This is accomplished through what

Fahnestock calls the "wonder" and "application" appeals (Fahnestock 279). While readers of scientific articles must be convinced to accept new ideas through careful and meticulous explanation and persuasion, readers of popular science must be amazed at uniqueness or excited by usefulness. In the quest for readers, writers of scientific journalism often resort to the "wow!" technique. They try not only to relate information, but to entice the audience through Fahnestock's wonder appeal.

The application appeal often results in a shift from science writing to technology writing. Although some readers may see science and technology as so closely related as to be the same field, Bazerman argues in "The Production of Technology and the Production of Human Meaning" that there are definite differences between rhetoric of science and rhetoric of technology based on three main distinctions: identification, degree of "enclosure," and the nature of the result of the field (382).

At the time when Bazerman wrote this article, the rhetoric of science had been clearly defined, but rhetoric of technology was still being defined and was hard to distinguish uniquely because of the complex interactions between technology and other fields. As Bazerman says, "technology must always overtly appeal to the marketplace, political ambitions, and personal desires" ("The Production of Technology" 383). In other words, technology is never solely for the sake of technology, but rather is created in connection with "human needs, desires, values, and evaluation" and so always must be presented as interconnected with at least one other field for which the technology has been created ("The Production of

Technology" 383). Next, he points out that science has become a closed field, with most rhetorical situations occurring between scientists within a field, and outside communication happening for the sake of explanation of the group's inner workings in order to procure more interest and thus funding. Technology, on the other hand, might start in an enclosed group, but soon becomes part of the public discourse when the technology becomes available at large (Bazerman, "The Production of Technology" 384). Finally, he points out that science produces symbols, while technology produces material results ("The Production of Technology" 384).

Kairos in Scientific and Science Rhetoric

Perhaps one of the most often-cited names in the study of scientific *kairos* is Thomas Kuhn. His book *The Structure of Scientific Revolutions* has become a central text of both the fields of history of science and rhetoric of science. In this book, he discusses both the formation of scientific paradigms as well as how those paradigms can give way to new paradigms as time goes on. In the early stages of a field, there exist multiple schools of thought, and in each, because an accepted base for the field does not yet exist, members constantly strive to define their study, devoting extensive research and explanation to the nature of the field rather than problems within it (13). However, once the field has been defined and members unite under one common (although not always consciously definable [45-46]) understanding, members may begin working on what Kuhn calls "normal science"—research that aims to solve the questions and knowledge gaps that are inevitably left or created when a paradigm takes prominence (24). This involves not necessarily a drive for

new theories, but rather attempts to solve the "puzzle" of how phenomenon can be explained through the accepted paradigm (34-36). In this way, a current paradigm will guide scientific research until a "new and unexpected phenomenon" that cannot be explained by the paradigm emerges to challenge it and prompts questioning and a possible paradigm shift to a new theoretical base (52).

Although Kuhn focuses mainly on the progression of scientific ideas rather than on texts, his argument—that new scientific ideas, rather than building on previous ones, happen through paradigm shifts, where the new ideas actually replace older ones—is firmly rooted in *kairos*. The timing of the cycle of paradigms and paradigm shifts plays a crucial part in the scientific conversation. Because a paradigm determines what is accepted as worthwhile, relevant, and probable, the research that happens and the information that is published and discussed in any particular scientific field will conform to the standards of the current paradigm. During these times of normal science within a paradigm, if an argument is presented that does not fall within the range of expectation, then the research, and the scientist who performed it, is considered a failure (Kuhn 35). However, if research produces compelling "novelties of fact or theory," then the community may begin not only discussing how particular "puzzles" may be solved to come to a pre-determined, acceptable solution, but questioning and debating the very standards and rules they must follow to solve the puzzle (52, 45-46). This may prompt a paradigm shift, after which, if it results in the formation of a new paradigm, will be "announced together with applications to some concrete range of natural phenomena; without them it

would not be even a candidate for acceptance" (46). Once the new idea is accepted, those applications become the basis for future research and development. The stage at which a field finds itself (doing normal science within a paradigm, prompting a paradigm shift, or establishing a new paradigm) determines whether acceptable research and discussion is aimed at application-based problem solving or theory-based identity formation.

The concept of paradigm shifts also influences who is remembered for scientific advances. J. Yruma's 2008 dissertation, "How Experiments are Remembered: The Discovery of Nuclear Fission, 1938-1968" covers the *kairotic* opportunities that led to the decision of who would be historically remembered for the discovery of nuclear fission. Carolyn Miller has also done extensive work in this field, including her two articles, "*Kairos* in the Rhetoric of Science" and "Opportunity, Opportunism, and Progress: *Kairos* in the Rhetoric of Technology." In both, she discusses the situational timing necessary for scientific and technical documents to have a lasting impact on the scientific community and on society itself.

To understand the role that scientific writing plays in the community of scientists, we must first look at the nature of scientific writing itself and how it developed into its current form. In their book *Communicating Science,* Alan G. Gross, Joseph E. Harmon, and Michael Reidy follow the history of scientific articles from the 17th century to present day. They ask the questions, "how does modern scientific prose leave us with the impression that it is the objective and efficient conveyor of cognitive complexity? … [H]ow did scientific style, presentation, and argument

happen to develop in just the way they did? … [And] what [would it] take to make our explanations less speculative than they now have to be?" (214). Together, these questions introduce the idea that *kairotic* timing and situation are an essential component of today's style of scientific communication.

The authors discuss styles and conventions, such as hedging (using phrases such as "it seems that"), using third person, and using headings, that have developed since the 17th century and which make today's audiences see prose as objective and professional (Gross, Harmon, and Reidy 215). These changes, they claim, have come about through a natural "evolution" towards the goals of "objectivity and efficiency" (219). However, as Gross et al. admit, even these concepts have evolved over time. The changes in scientific articles then, have "evolved not in the sense of becoming better (or worse), but in the sense of changing to cope with the communicative and argumentative needs of an evolving set of disciplines whose messages have become ever more complex" (Gross et al. 219). In addition to the ideas themselves that are being communicated, the shift in the audience's common beliefs and expectations have changed the way that scientific communication happens, and scientific rhetors must always determine what is necessary for the *kairotic* situation in which they find themselves at any particular point in history. In other words, rhetors must account for the "social, political, and economic niches in which, and in interaction with which, the change takes place" (Gross et al. 228).

In "Galileo and the Rhetoric of Relativity," Peter Machamer brings up Galileo's acknowledgement of how different language is used to describe knowledge

at different historical moments. When challenged about his astronomical views with the Bible, Galileo said that in order to be intelligible to most people at the time it was written, the Bible had been written in a "common" language that simplified all knowledge (Machamer 34). He claimed that with this view, modern readers who read the Bible based on "uncommon" ("'learned' or 'expert'" [Machamer 34]) language would be able to reconcile Biblical explanations with modern logical and reasonable explanations. Galileo also dismissed anyone who accepts knowledge without first-hand experience or research as simply being unknowledgeable or unintelligent (Machamer 33). However, the research that one would have to do to gain knowledge obviously changes with time. The notion of what counts as knowledge changes depending on the intellectual atmosphere at the moment that a person decides to learn.

An issue with this model rested on the question of how one could tell when proof had been established. Galileo used a method of balancing (Machamer 38). In the example of determining the nature of bodies in motion, Galileo relied on the idea of using geometry to balance forces (Machamer 38). Because at the time the image of the balance was, although historically contested, widely accepted as a symbol of proof of truth, this allusion allowed common people to test the information they received and symbolize that their experiences represented truth (Machamer 36). Although at the time most knowledge was relative (e.g. moving bodies could be analyzed relative to each other, but not just as individual entities), the idea of comparing and balancing seemed logical (Machamer 37-38). Until Newton "changed

the ground rules with algebra replacing proportional geometry, absolute space replacing relational space, [and] true motion replacing relative motion," knowledge had to be analyzed in comparison rather than as a truth in and of itself (Machamer 38). The arguments here show how the prevailing views at any particular historic moment can change the definition of knowledge and how knowledge is gained. The characteristics of the *kairotic* moment determine not just what is learned, but how it is learned and how the learned material is accepted.

This issue of acceptance or dismissal continues to be a pivotal one for professional scientists today, and the *kairos* of publication occupies a major role in this. New scientific ideas often must be solidly grounded in existing research in order to be funded, be accepted for publication, and be acknowledged in the field as legitimate and relevant. Ideas that seem too revolutionary or are not grounded in a solid enough background of previous research have the potential to be disregarded (Paul and Charney 397; Kuhn). But in an environment that can be hostile to ideas that seem "too" new, how do new scientific ideas gain acceptance in the scientific community?

In researching effective methods, as Danette Paul, Davida Charney, and Aimee Kendall discuss in "Moving Beyond the Moment: Reception Studies in the Rhetoric of Science," it is important to remember that texts are often analyzed based on the perceived success we view them with today. For example, even though Darwin is often assumed to have been effective and is analyzed in terms of that effectiveness, at the time of his publications, he failed to persuade his intended

audience (Paul, Charney, and Kendall 376). John Angus Campbell discusses the *kairos* aspect of Darwin's publications in more detail. As he says, although the methods of the scientific community of the time influenced Darwin's work—for example, prompting him to only collect a couple samples of each species rather than taking a more comprehensive approach to observation and referring to God's hand in the laws of nature—because his conclusions did not fit in with the accepted scientific expectations, his initial publications were rejected (60, 62, 67). However, this initial rejection did prompt debate and, as Campbell suggests, perhaps enabled him to help create the *kairotic* moment that later allowed *Origin of Species* to gain such influence, even if that success came later than Darwin intended.

In addition to discussing the issue of viewing historical publications from today's vantage point, "Moving Beyond the Moment" mentions that success itself is difficult to pinpoint. For example, in the field of genetics, Watson and Crick are held up in studies as an example of rhetorical effectiveness while Avery, MacLeod, and McCarty's rhetorical methods are suggested to be ineffective because they are not often remembered in popular histories, even though the latter scientists actually had a profound impact on the field (Paul, Charney, and Kendall 377). However, Halloran actually suggests that Watson and Crick's effectiveness comes from their nonconformity with accepted scientific styles. They used a "genteel," personal style, saying for example, "we wish to suggest a structure…" rather than using a more objective third-person voice and made what many would consider subjective, unscientific comments, such as "a structure this pretty just had to exist," within their

scientific report (Halloran 74, 73). Avery's paper, on the other hand, was "much longer and more dense with technical detail," and was in alignment with acceptable standards of scientific writing, including passive voice objectivity, which may have kept the paper from enjoying the wide-spread revolution that Watson and Crick prompted since only a select group could read and understand it (Halloran 76).

With consideration of the effect of hindsight in mind, in the article "Introducing Chaos (Theory) Into Science and Engineering: Effects of Rhetorical Strategies on Scientific Readers," Paul and Charney look at articles from a somewhat new field, chaos theory, both when it was newly formed (around 1975-1978) and after it had been established and gained a collective of work within which to base new discoveries (around 1989-1990), and the effect of the articles' introductions on readers (401).

Paul and Charney found that modern readers commented more on ideas that were heavily linked to already-established ideas than they did on newer, more revolutionary ideas. In addition, readers were more engaged in writing that related to their own work (Paul and Charney 423). With this in mind, even with work that is grounded in extensive previous research, convincing the audience that the time is right for a new idea is vital. With skill, if the *kairos* is not quite right for an idea yet, the author may create the *kairotic* moment, which will allow his or her work to gain acceptance. In relatively new fields though, *kairos* creation may be particularly important, since there may not be enough knowledge established in which to ground a new work. The writers may do this by "citing as much relevant research as

possible" in order to convince readers of the legitimacy of the new idea, or they may simply try an entirely new approach to writing, as Watson and Crick are purported to have done in their article announcing their DNA-related discovery (Paul and Charney 399-400). When there is little previous research, Paul and Charney found that writers tend to be cautious and rely more on creating the *kairotic* moment with extensive citations that create a niche to be filled by the research, whereas in an already-established field, authors may be able to rely more on the existing *kairos* without having to cite in order to convince the audience that the research has a place in the conversation (408).

The *kairos* has to be right not only for the writer, but for the reader. The writer may effectively establish a *kairotic* moment for his or her research that allows the new ideas to be accepted, but on an individual level, the audience must read at a time of *kairotic* opportunity related to the reader's interests. The *kairos* can change depending on the reader, and proponents of new ideas must work to establish as much *kairos* as they can in order to help ensure that each reader finds the idea relevant at the right time. In "In Praise of Carbon, In Praise of Science: The Epideictic Rhetoric of the 1996 Nobel Lectures in Chemistry," Christian Casper focuses on this aspect by analyzing the delivery methods of a group of researchers both as they introduce a newly discovered carbon molecule (fullerenes) and as, years later, they accept the Nobel prize for this same discovery after it has been fully accepted in the scientific community.

As Casper notes, the team moves from defending their discovery and attempting to convince their audience of its validity to celebrating the discovery as something that is widely accepted and can be built upon (321). When they are still introducing their ideas to the scientific community, the scientists mainly use claims couched in phrases that signify that the ideas are either conjecture or are not widely accepted yet, perhaps by stating something like "it may signify," or "research has shown that" (Casper 307). However, at the Nobel ceremony, the authors no longer must defend their findings. The research has been fully accepted, so the statements are either stated as true without defense, or they are taken for granted as being true so that statements about other ideas based on them can be put forth, such as the idea that fullerenes are self-assembling (rather than focusing simply on the idea that fullerenes exist) (Casper 314). This change is based strictly on the situation in which the scientists find themselves at the time of each presentation. The audience—professional scientists—remains the same, but at different *kairotic* moments, different styles become effective. The mood and views of the audience have changed, which has changed the rhetorical moment and changed the required rhetorical methods.

Moving among different audiences can depend on *kairos* just as much as moving temporally with the same audience does. As suggested by Fahnestock, when translated from the science community to the lay community, scientific information often becomes focused on the applicability of new technology. Bazerman's "The Production of Technology" explains not only the differences between, but the

characteristics of the rhetoric of science and rhetoric of technology and how the fields interact with the public. These differences and characteristics point to differences in *kairotic* moments for science rhetoric within the field and science rhetoric with the public. Depending on the outcome of the writing, whether science theory or technological gadgets, the timing depends both on interactions and on audience. Interactions between the writing and society, including the monetary and political interactions Bazerman discusses, determine who hears the message and when the message is presented.

Fahnestock's wonder appeal also applies to the shift to rhetoric of technology that often happens within science writing. As Dorothy Nelkin says in her chapter "The Press on the Technological Frontier," the 1982 *U.S. News and World Report* had a tendency to use words like "startling," "radical," and "revolutionary" when describing science, especially when discussing "anticipated breakthroughs" (31). Although the press became more cautious over the next decade, these sorts of descriptions continued, albeit with hedges acknowledging that science is "breakthrough only if people adopt it, using it to change the way they work and live" (Nelkin 31). As scientific progress continues, the language doesn't necessarily change, but the developments that the language is used to describe shifts. For example, as the field of genetics has continued to develop, the wonder has shifted from the nature of DNA (as in the 1977 *Time* headline "The DNA Furor: Tinkering with Life") to the applications of genetics (as in the 1990s idea of the "runaway science of genetic engineering) (Nelkin 36). While the nature of the wonder appeal

doesn't seem to have changed, the *kairotic* situation of the scientific community and the public community determines what is seen as wondrous and what is considered simply mundane.

From the other direction, *kairotic* (or anti-*kairotic*) timing may determine when a message is *not* presented. In *Silencing Science: National Security Controls and Scientific Communication*, Harold C. Relyea discusses how the political timing of scientific progress may actually prevent the information from being communicated at all, or may keep communication within a very select audience. In his chapter "Science, Technology, and National Security," Relyea discusses how the world over, the issue of national security has prompted governments to "contro[l] traditional professional communication concerning science and technology" in order to ensure "safety or survival of the country" (38).

Although many Americans "think of national security too largely in purely military terms," in 1949, the Task Force on National Security Organization stated that "valid national strategy must embrace all our natural resources of every kind—human, material, industrial, *scientific*, political, and spiritual" (qtd. In Relyea 46, emphasis added). Preventing the distribution of some scientific ideas, therefore, became a strategy in international politics. However, even a lack of overt hostilities is no guarantee that scientific information will be shared. As Relyea points out, when the Cold War ended, Americans began to focus on the economic dimension of national security and continued to restrict scientific communication not in the name of security, but in the name of international competitiveness (39).

Since the 1949 Task Force declaration, and especially after the public outcry surrounding the government's conduct during the Vietnam War, government-mandated scientific secrecy has been lifted somewhat in response to the idea that controlling such information gives excessive power to the bodies determining the level of control (Relyea 58). There continues to be, however, a modicum of secrecy in matters of "military-critical technology," such as atomic bombs, which is determined based on a (rather vague) idea of a "risk calculation procedure" (Relyea 54-55, 60). A *kairotic* situation can stop scientific communication just as easily as it can encourage it. If introducing a text into a particular rhetorical situation could have an undesired effect, then measures may be taken by the rhetor, by someone in a higher position, or sometimes even by the audience to prevent the discourse from continuing or from occurring in the first place.

Conclusion

Analysis of *kairos* must take into account not only the personal situation of the rhetor, but all the societal issues that surround any given rhetorical action. This includes issues of chronological timing, politics, societal beliefs and norms, and any number of other variables. The *kairotic* situation may prompt or discourage a rhetorical action as well as determine the reactions to the action.

While, as scholars like Kinneavy have shown, *kairos* is a cornerstone of all rhetoric, for science and the rhetoric of science, *kairos* is especially influential. Especially in the dissemination of scientific information, *kairos* plays a vital and intricate role in what is communicated, when and how it is communicated, whom it

is communicated to, and what the reaction is to the communication, influencing scientific and technological progress and determining the development of knowledge and ideas in both the scientific and public communities. Such an extensive and lasting impression deserves more than a cursory glance.

CHAPTER 3: SETTING THE SCENE: THE GREEN MOVEMENT, AL GORE, AND POPULAR SCIENCE

The American Green movement

In the broadest sense of the term, environmentalism has a long-standing tradition in America. One of the first national nature-focused groups, the Sierra Club, was founded by John Muir in 1892, but had only marginal resemblances to what we consider an environmental advocacy group today (Stoll 8). This group was founded on the idea of viewing nature in a romanticized light, as "places of contemplation and refuge from the stresses of rapid social and economic change," where one could experience "a feeling of awe and fear at the transcendent power of God" (Stoll 6). At the time, nature overall was still untamed by human progress, and as a result, individuals like Muir did not necessarily advocate for the protection of nature on the basis of morality or social issues, but rather encouraged club members to leave the cities and venture into the mountains to see the majestic spectacle of nature. When the Sierra Club did attempt to take action in defense of natural places, it was based simply on the idea of keeping wild places a personal retreat from the advances of human progress (Stoll 8).

The modern concept of environmentalism as a social movement was born sometime after 1945, although the exact origin cannot be pinpointed (Stoll 2, 11). This was the year that the U.S. developed the most powerfully destructive weapon created to date: the nuclear bomb. In July, a test bomb was exploded in a New Mexico desert, and in

August, the U.S. dropped bombs on Hiroshima and Nagasaki. In Japan, thousands upon thousands of people died in the blast or soon after. However, the effects were felt around the world. The plumes that were released into the atmosphere subjected everything on the planet to low but consistent levels of radiation and citizens around the world came to the realization that the fate of human kind is inextricably tied to the fate of the earth itself (Stoll 1). In a nightmarish blast, modern environmental ideology took root and began to grow.

For a time, the movement grew in fits and starts, in specialized interest groups or closed scientific or political communities, without a singular center or goal but with the common belief that industrial production, consumerism, and the rapidly growing human population were the enemies of the environment (Stoll 2). In 1962, Rachel Carson published her landmark work, *Silent Spring,* an environmental book aimed at a public audience rather than at the scientific community. In it, Carson attacks the use of harmful chemical pesticides and creates a major foundational landmark of contemporary environmentalism, bringing together for the first time a broad public audience, "from bird watchers, to wildlife managers and public health professionals, to suburban homeowners" in a movement for environmental change (Lutts 221). However, rather than simply declaring science the enemy, as was the trend of previous environmental rhetoric, she acknowledges that there is indeed a problem in need of a solution, and hopes that science will solve the problem of controlling pests without resort to insecticides—or, as Carson calls them, biocides (Killingsworth and Palmer 28, 30). She claims that the issue is not science itself, but rather the science-centered paradigms that currently exist, and she calls not for a stop to science and industry, but for an adjustment in how the community—

specialists and lay people alike—thinks about scientific progress (Killingsworth and Palmer 29). The result was that science moved from a closed community existing in the pages of research journals to an open community that allowed "the public and its agents in government" some control over scientific discourse (Killingsworth and Palmer 29).

In the following decades, environmental rhetoric aimed at the general public flourished. Even environmental writers who had written before *Silent Spring*'s publication, such as John Muir and Aldo Leopold, were caught up in the new social movement and gained a popularity that they had never previously enjoyed (Killingsworth and Palmer 27). The appeal of environmentalism to the American public was starkly apparent in 1969 and 1970 when Wisconsin Senator Gaylord Nelson called for a national environmentally-based teach-in, a protest measure created during the Vietnam era in which students gave speeches, artistic performances, and academic discussions in campus buildings (Stoll 18). The response was overwhelming. Twenty million people participated across the country, and on April 22, 1970, Earth Day was born (Stoll 18).

For the first time, environmentalism began to look like a unified social movement with ideals that could be shared by most Americans rather than the scattering of specialized mini-movements that it had resembled up until that point (Stoll 18). The first Earth Day participants compared the ravaging of resources by corporations and the government to the atrocities of the ongoing Vietnam war and demanded that politicians and business leaders stop attempting to unethically smooth over environmental issues with simplified and misleading PR campaigns and begin implementing drastic improvements to environmental policy before "our last chance" to save the planet passed by (Hayes 109). They related the green

movement to politics, social reform, industry, science and technology, and consumerism, bringing the interconnected nature of environmentalism to the forefront of the discussion (Hayes 108-09).

This interconnectedness became a defining aspect of the green conversation, so much so that by 1996, George Myerson and Yvonne Rydin note in the introduction to *The Language of Environment: A New Rhetoric* that

> in academic terms, "environment" belongs to every discipline and to none: chemistry and biology, ecology and sociology, philosophy and geography, engineering and politics, psychology and history, media studies and cultural theory. In media terms, it is harder and harder to draw a line around certain issues and say; this is an environmental issue. War and trade, food and transport, weather and protest, animal rights and international relations: "environment" is inescapable, and it challenges the boundaries between news area that are otherwise distinct, domestic or international, major catastrophe or minor incident, good news or bad news. (v)

While the concept of tying environmentalism with other social movements was radical in the 1960s and 70s, in just a couple decades, thinking of environmentalism as an isolated topic became nearly impossible. Within half a decade, the focus of the green conversation shifted from an idea of protecting nature for romantic ideals of beauty and serenity that could be used to isolate oneself and escape society to the idea of an environmental movement that connects conservation and preservation with all other aspects of the human experience.

As the genre of green rhetoric grew, advocates developed distinguishing styles. As Arlene Plevin explains in "Green Guilt: An Effective Rhetoric or a Rhetoric in Transition?" many environmental groups, such as the Environmental Defense Fund, the National Wildlife Federation, and the National Audubon Society adopted a "rhetoric of guilt," playing on the audience's emotions with images and phrases that seem to place blame for any negative actions, such as deforestation, pollution or animal deaths, on the non-action of the reader or listener (126-27). The language tends to include words that prompt action such as "'think' and 'act'," that suggest a moral imperative such as "'must' or 'should'," and that carry emotional or moral connotations, such as "responsibility," and refers to subjects with inclusive possession, calling it "our earth" or "our wetlands," to instill a sense of ownership and personal connection in the reader and to "underscore a sense of urgency and set up an 'us' versus 'them' duality" (Myers and Macnaghten 6; Plevin 127, 131). The organizations also use carefully selected images of "injured birds, damaged riparian areas, severely polluted sites, and bulldozed land" that, along with the accompanying platitudes and warnings, are meant to illicit a sense of horror, sadness, or anger (Plevin 127). And in case the reader has the mentality that one person cannot make a difference anyway, the publications include phrases like "your actions do make a difference!" to assure readers not only that a positive outcome will result from their actions, but also implicitly suggest that negative outcomes can be attributed to their non-action (Plevin 134). The combined effect is a powerful pathetic appeal, with the goal that the audience should feel compelled to

act because of an urgent moral imperative and an individual sense of responsibility, and they should immediately donate money or write or call a person of higher standing, such as a politician or a company executive, who has the political influence to make the desired changes.

Others writers, including Carson, attempt to create a "rhetoric of doom," wherein the audience is warned that non-action will result in the gravest of consequences, often depicted in morbid and apocalyptic fashion (Plevin 130). The direst of these warnings often involves the end of the world and of human existence. As Jimmie Killingsworth and Jacqueline S. Palmer explain, rather than directly attacking progress, the most successful attempts act as "shock tactics to win the hearts and minds of the general public at crucial historical periods" when people might be more willing to listen and respond to appeals for change (22). The consequences of non-action may include elements such as the destruction of natural areas, the extinction of different species, and finally, the death of humankind. The goal is not prediction, but rather political; the goal is to change the world by convincing the audience to make changes by frightening them with the consequences of maintaining their current actions (Killingsworth and Palmer 41). Such apocalyptic warnings have always been an aspect of human culture, especially as a response to what some groups see as the threatening aspects of scientific advancement, and therefore often have a tendency to go unheeded (Killingsworth and Palmer 24). However, when combined with the rhetoric of guilt and the attached sense of moral obligation, this method becomes a powerful tool in green rhetoric.

In both the guilt and doom methods, action is urgent and should be immediate. These methods, however, are dangerous for the rhetor, as they tend to

create sudden but short-lived supporters and fail to be effective "beyond an isolated community of like-minded individuals" (Plevin 136-37). The audience is bombarded immediately with every rhetorical weapon available and, if the audience is not already sympathetic to the text's goal, the result may be either the desired sudden urge to act or it may be an immediate discrediting of the text and possibly of the text's subject. In either case, the effect is short-lived. The audience is unlikely to respond past the initial reaction, resulting in the need to re-convince the audience to take action each time the discussion is prompted. Rather than continuing an ongoing and growing dialogue, the same conversation happens again and again. In these situations, as Plevin notes, the audience begins to develop an immunity to the repetition of the same persuasive argument, rendering what may have once been an effective method useless. "After numerous such letters," she asks, "might I be numb to those seemingly endless requests?" (125) What is needed instead, she argues, is "dialogue between differing parties" that encourages continued action and support, not a rhetorical finger-pointing game (137).

An Inconvenient Truth: Gore's Rhetorical Arsenal

Al Gore's 2006 publication of his book *An Inconvenient Truth* (AIT) began the movement towards a rhetoric of dialogue rather than blame within the green conversation. While he did continue the genre trend of utilizing doom and guilt rhetorics, he used them as tools to begin dialogue and to call his audience not to a single action, but to a lifetime of dedicated action. Unlike many previous green texts, which directly built the audience up to an emotional high before asking for support,

Gore pulls his audience to new emotional heights, prompting feelings of anger, fear, and urgency while periodically allowing readers to temporarily dispel these negative emotions through Gore's personal stories. This build-up-and-cool-down tactic allows Gore to push the doom and guilt rhetorics farther than most previous environmentalist texts were able to carry them without losing the audience and gives him the opportunity to make the audience connect with him, and thus with his topic, on a personal level. This gives Gore the hold he needs to convince his audience to commit to the continuous lifestyle changes that he proposes as well as to encouraging them to continue the conversation themselves once Gore's lesson is over.

Through a combination of statistics, facts, logical arguments, and descriptions of personal involvement, Gore attempts to demonstrate a masterful knowledge of the field. This knowledge is part of what makes Gore's message believable. Gore does not simply tell his audience that humans are destroying the environment. Instead, he uses statistics, data, reasoning, and deduction to prove his case. Although he occasionally ventures into grandiose language, such as when he says "if we allow [CO_2 levels to rise], it would be deeply and unforgivably immoral. It would condemn coming generations to a catastrophically diminished future," much of the language is straightforward description or explanation (67). For example, he writes "the graph below shows the number of days each year that the tundra in Alaska is frozen solidly enough to drive on" (135), and "the pre-industrial concentration of CO_2 was 280 parts per million. In 2005, that level, measured high

above Mauna Loa, was 381 parts per million " (37). In each of these examples, Gore is simply relating "facts," that either relate directly to the provided visual or that stand on their own. However, in both cases, the style works for his goals. The straightforward gravity of the language prompts the audience to think analytically about the information being presented and see it as logical evidence, especially when data or numbers are involved.

The visual graphs, charts, maps, and images comparing the same location at different time periods serve a similar purpose. They show numerical or visual evidence that allows readers to make classic Aristotelian syllogistic deductions. A technique that Gore relies on heavily throughout the text is that of enthymemes. Aristotle defines enthymeme as "when it is shown that, certain propositions being true, a further and quite distinct proposition must also be true in consequence" (182). Gore provides the initial propositions for his audience, and allows the audience to make their own logical deductions based on his evidence. In other words, Gore begins enthymemes that his audience finishes themselves. For example, one graph shows an overlay of CO_2 levels and global temperature (67). The reader can see that the lines correspond to each other and that in the time that humans have had industrialized society, CO_2 levels have risen dramatically farther than at any previous point. The text pointing to the current temperature says, "that short distance—about an inch on the graph—represents the difference, in Chicago, between a nice day and a mile of ice over your head. Imagine what three times that much on the warm side would mean" (67). From this, Gore leads readers to make

some connections: Human society is causing CO_2 levels to rise, which will cause the Earth's temperature to rise, which will result in deadly living conditions. Gore does not need to say, "humans are destroying the planet" to lead his audience to make that conclusion themselves through looking at the information he presents and making their own logical deductions. The fact that Gore allows the audience to make this final logical connection rather than outright telling them what the connection is makes his argument more believable, because the audience participates in the reasoning process.

However, the most compelling aspect of AIT stems from Gore's ability to utilize what Augustine calls grand and subdued rhetoric in a way that allows him to build a strong *pathetic* argument. In *On Christian Doctrine*, Augustine says that eloquent rhetors speak "in a grand style on great matters," but that if a rhetor is

> the spokesman of great subjects, he need not necessarily always speak in the grand style, but in a subdued manner when something is being explained, moderately when a thing is being criticized or commended; but when something ought to be done … [the matter] should be stated in the grand style, and in a manner adapted to move [the audience's] hearts. (470, 471)

Following Augustine's advice, Gore uses a mixture of straightforward, logic-centered subdued rhetoric and ornamented, emotionally-laden grandiose rhetoric to manipulate the audience to higher and higher emotional levels and thus achieves a

level of public influence that previously had not been enjoyed by many environmentally-focused rhetors.

Overall, the language tends to maintain a straightforward, subdued style. However, as a result, on the occasions when Gore does use grand oratorical style, the effect is magnified. For example, above a full-page photo of a garbage pile, he writes "we are witnessing an unprecedented and massive collision between our civilization and the Earth" (214). Where this statement alone may prompt readers to dismiss the sentiment as overly dramatic, the shift from the simple informational style of the majority of the book to the grand style here causes readers not to turn away, but to pay more attention. The style adjustment causes reader to analyze the reason for the change, which allows the phrase to have the desired dramatic effect.

The language, although powerful, is not the main weapon of the text. The real *pathetic* power lies in the images that are the central focus. These visuals occupy the bulk of the available page space and seem to follow the same rule of grand and subdued styles, but in an opposite combination than the language—the overall style is grandiose, with subdued styles included at strategic times that allow readers to somewhat level their emotions before being swept up again. Most of the pages in the book have full-bleed images that use dramatic, eye-catching colors; large, sans-serif text that on fronts the reader and seems striking without serifs to help the eyes move smoothly from one letter to another; and images that capture attention, such as impressive and alarming charts, pictures of smog-covered cities, or photos and computer-enhanced pictures of Earth. Many of the images suggest

violence or devastation, such as images of hurricanes (83, 85), images of flooded streets (109-110), and a shot of a collapsing glacier (184-185). The pages with personal stories, however, are more visually subdued. On these pages, the text is a serif-based font in a familiar, smaller size; the background is a calming beige; and the pictures are black-and-whites of Gore, his family, and his colleagues, often in a portrait (e.g. the portrait of Gore's natural sciences professor from college, Professor Roger Revelle [39]), in celebration (e.g. the image of Gore with his father following a successful election [212]), or in a bonding activity (e.g. the picture of the Gore family camping or the images of the family supporting young Albert Gore during recovery after his accident [160; 71]). Most of the pictures are small, inviting readers to search them out rather than attacking readers with attention-grabbing, multi-page spreads. The only full-page photos have calming, still backgrounds, such as the blank background in portraits. These visually calming interludes allow readers an emotional retreat from the onslaught of graphic images in the majority of the text.

The style also adjusts within the dramatic images themselves. When comparing these pages to each other rather than to the personal interlude pages, there is a pattern of mixing comparatively subdued images with more grandiose images, all the while building to more and more dramatic images as the reader moves forward. The first pages after the introduction are full-bleed, mostly black pages with images of the earth and alternate between pictures taken from space (13, 14, 22-23) and computer-generated globes, maps, and diagrams (16-17, 18-19, 26-27). Interjected on pages 24-25 is a dark image of a factory spewing black smog into

the air. Although the image is dramatic and excites some passion, the dark color's similarity to the previous pages keeps the audience from being completely shocked. The next pages are mostly black, with diagrams and text describing "the basic science of global warming" using computer-generated images of the globe with a blue halo representing the atmosphere and yellow waves showing movement of energy from the sun to the Earth's surface and red waves showing energy as it is reflected from the planet's surface and either radiated into space or reflected back down by the atmosphere (26-27). The white text gives a basic description of the process that is shown in the images. While the image itself is not excessively visually striking, the information presented makes audiences begin to think about how global warming occurs. Then, on pages 28-29, there is a two-page spread of an image of a clogged freeway. Although the picture itself is not bright, when compared to the pages before it, it is a dramatic change. Pages 30-35 return to mostly black background with simple images and graphs, bringing the reader back down from the shock of the freeway image. Pages 36-37 are mostly white space with an alarming rising red zig-zag graph that builds the reader's tension again before delving into a calming personal interlude on page 38. This organization produces a wave-like effect; it gradually builds excitement from a calm picture of the Earth from space to computer-generated maps, to the factory image, to the global warming diagram until the peak at the freeway image. It then allows a gradual decrescendo, returning to black-background images first of a striking, upward-sloping, thick, red, jagged line, then to the more calm images of maps and globes. At the end, it

introduces another, less dramatic peak with a white-background graph before a soothing interlude about Gore's college mentor, Roger Revelle, which allows readers to emotionally level out before delving into the next passion-building section.

Each between-interlude section follows this type of wave-like pattern, using similar images for a number of pages before breaking in with comparatively visually dramatic images that peak the reader's excitement before bringing the reader back down with less dramatic images, then up again, then down again, continuing until Gore allows the reader an emotional respite with another personal interlude. The sections themselves also follow this pattern. For example, the first section, detailed above, slowly begins readers' upward trend towards passion. The next section, detailing the growth of CO_2, is more detailed and alarming, but does not completely impassion readers yet. The third section, about rising temperatures and the resultant stronger tropical storms, brings the reader to a height of excitement, with alarming full-page pictures of hurricanes (80-81, 83, 85, 94-95, 104-05); a two-page, full-bleed color spread of photos of Hurricane Katrina's devastation of New Orleans (96-99); images of floods in Switzerland; India; and Shangdong Province, China (108-09, 111, 112); and a picture of the draught-ravaged land of Anhui Province, China (113). This time, however, the interlude, detailing little Albert's accident, is not as calming as the previous ones; it brings the environmentalism fervor down slightly, but keeps overall tension high. The next section is relatively calming, detailing the effect of global warming on the arctic. Compared to the first section, the images here, of trees falling (130-31), buildings collapsing (132), and trucks sinking

in thawed permafrost (134), are dramatic. However, compared to the previous section on hurricanes, these images do not seem violent at all. The effect is that readers are allowed some relief but are still at a level of excitement higher than when they began reading. The overall effect allows Gore to gradually and indirectly build readers to a level of passion that he may not have been able to achieve by consistently building excitement using only grand style.

The entire book continues in this fashion, with sections that build tension to higher levels, then sections that slightly reduce tension, then sections of still more tension, until images of deforestation (221, 227), strip mines (238-29), fire (228), desert-bound ships (244-45), and nuclear explosions (235) fill the pages. Following this last alarming section is an inspiring interlude about Nancy Gore, Al's sister. This interlude, at first glance, seems like it will be simply an inspiring story to lift the reader's spirits after the tragedy of the previous section. The first image is a full-page portrait of Nancy, looking sophisticated and happy, wearing a string of pearls and smiling (257). The remaining images are of Gore's family when he was a child and feature him and his sister enjoying happy times canoeing and driving on the family farm (258-59).

The text, however, tells a different story. At first Gore gives a nostalgic description of Nancy, describing her as "luminous. Charismatic. Gutsy. Astute. Funny. Incredibly smart. And kind" and says that she enjoyed duck hunting and was "one of the first two volunteers for the Peace Corps," creating a character that readers can relate to and sympathize with (256). Once readers are enamored with

Nancy, Gore shocks them with the story of Nancy's horrific death (258). He then turns readers' negative emotions against what he says is the agent of Nancy's tragic end—cigarette companies (256, 259). Because the reader is devoted to Nancy and angry about her untimely death, it is easy for Gore to pull the reader into an "us-against-them" battle against the cigarette companies. When he thinks readers have sided with him against the cigarette companies, he brings readers back to the environmental argument by comparing the effect cigarettes have on the human body to the effect that pollution has on the Earth (259). By allowing readers to connect emotionally with Nancy and then relating her death to the fate of the planet if global warming continues, Gore gives readers a personal and emotionally-laden connection to the issue, giving additional strength to the conviction for environmental change that, at this point in the book, he has already tried to firmly establish.

Finally, with the audience convinced to heed Gore's call for change through both reasoning and emotion, the call to action begins. At this point, Gore has built his readers to the climax of tension and uses a more subdued but still grand visual style for the remainder of the first portion of the book. There are no more two-page spreads of devastation and violence. The reigning colors are no longer the dramatic contrasts of light and dark, reds and blacks. There are more calming colors—shades of blue, green, grey, and orange, with enough white space to make the images non-threatening. The pictures imply creation and forward movement rather than destruction: solar panels, rooftop gardens, windmills, and water (277-79). There are

graphs that move, to the audience's relief, down rather than up (294). And finally, the persuasive portion of the book ends with a two-page full-color spread of a picture of earth from space, reassuringly still floating in the void after all the havoc the reader has now been exposed to (302-03).

Augustine notes that the grand style is "not so much adorned by ornate expressions, as rendered passionate by the heart's emotions" (474). The grand style of the main sections prompts similar emotions to the previous doom- and guilt-based environmental rhetorics: fear, anger, guilt, and despair. However, the comparatively visually subdued personal interludes allow readers some relief with feelings of connection, pride, and discovery, emotions that allow the reader to dispel the strength of the negative emotions. These interludes, along with the emotionally uplifting there-is-still-hope ending, give Gore an opportunity for the real reason for his presentation: the discussion opening that Plevin called for in 1997.

In this last section, Gore no longer employs the emotionally persuasive rhetoric that made the first portion so powerful. Rather, since his audience is presumably already persuaded that a problem exists and needs to be fixed, Gore simply needs to provide a solution. The rest of the book is visually subdued. There are few pictures, and those that do exist are small calming or reassuring images, such a picture of a cozy, well-lit house (306) or a photo of a woman shopping for fresh produce at an outdoor market (314). Even the one image with potential to become emotionally charged manages to come across as non-threatening: an image of a picketer shows what appears to be a healthy, happy teenaged girl smiling and

holding a sign adorned with Dr. Seuss's Lorax, a character who, though strongly advocating for environmental protection, remains non-threatening by virtue of his toy-like appearance and his identity as a victim of poor environmental policy (319). The pages themselves are light grey-green, with dull green boxes for intervening information. The color combination prompts calm acceptance of the instructions being presented. Even the blank space at the top of each page is a stark contrast to the rest of the book. Where before full-page images assaulted the reader, here the blank area reassures the reader that the text is here not to attack, but to help, allowing the reader to come to the text rather than being confronted.

The language is also subdued, prompting the audience to read rationally rather than emotionally. In the section's introduction, Gore directly addresses the audience, saying that "on the following pages you will find a range of practical steps anyone can take to reduce the stress our high-tech lives exert on the natural world" (305). The instructions include both imperatives (e.g. "wash your dishes by hand, and use a clothesline to dry your clothes" [307]) and explanations (e.g. "hybrids consume far less gas and are much cleaner for the environment" [312]). Combining instruction and explanation in this fashion keeps the audience from questioning since the background on why the instructions should be followed is already present. The explanations themselves often use numerical data as evidence, such as stating that it takes "about 15 million trees … to produce the 10 billion paper bags we go through each year in the United States," prompting readers to see the explanations as logical, scientific arguments (316). The interludes Gore includes in this section

are different from the personal stories in the first portion. They take up only a small space on the page, acting as a supplement rather than a pause and each contain one of "the 10 most common misconceptions about global warming" (308). The misconception is in quotes at the top of the box, followed by the "truth" underneath. For example, Misconception 1 says, "'Scientists disagree about whether humans are causing the Earth's climate to change.' In fact, there is strong scientific consensus that human activities are changing the Earth's climate" (308). Rather than creating an emotional effect, these asides are simply to provide additional information and are presented in direct language that is not meant to raise or lower emotions that presumably have already been heightened to the point of persuasion. Rather, these boxes exist in order to teach the audience how to become teachers of the subject themselves. In this way, Gore displays the ultimate persuasive power of his rhetorical strategies. His audience is not only convinced of Gore's arguments; they have been convinced to become rhetors who will themselves persuade others. Rather than passively accepting Gore's conclusions, audience members adopt those conclusions as their own, firmly embedding Gore's argument within their own belief system.

An Inconvenient Truth as a Science Text

There has been debate about the validity of the science in AIT (Nielsen-Gammon; Zatzman), but one thing is certain—as a text, it has had a significant impact. While the persuasive effect of the document certainly was a major contributor to that impact, another factor is that Gore mixes qualities of the

scientific and popular science genres. This mixture gives Gore considerably more persuasive power and at the same time opens him up to the criticism he received concerning the questionable nature of his data and research as scientific. It also makes AIT a convenient text for rhetorical analysis.

Fahnestock describes the goal of articles for the scientific community as persuasion while science articles written for the public are meant to inform, entertain, and reassure. In this case, Gore does all four. The majority of the book is forensic oratory; it is spent attempting to persuade his audience that global warming exists and is an issue worth their attention. Gore says in the introduction that over time he learned that "not only does human-caused global warming exist, but it is also growing more and more dangerous, and at a pace that has now made it a planetary emergency" (8). If Gore had assumed that his audience shared this view, he could have skipped directly to the informational portion at the end of the book. However, instead, he spends 303 pages attempting to convince the audience of this truth that he has discovered. Unlike with many popular science articles, the audience does not necessarily accept everything Gore states as solid fact. Rather, as is often the case in scientific texts aimed at the scientific community, the audience is reading in order to determine whether or not to believe his argument. The informational final section of the text, rather than seeming like the application appeal used in popular science texts, seems more like a scientific text's call for further action on the subject. For example, if chemical scientists were to create a new molecule, in a scientific text they could call for further study on that molecule

or for other scientists to adjust their methods in light of the new information, whereas a popular science text on the same subject may explain to the audience how the new molecule is different from previously known molecules or how it could be used in the reader's everyday life. Gore does not suggest that global warming is something that readers can use to their advantage (although he does seem to imply that it is fatalistically awe-inspiring). Rather, he calls for the audience members to adjust their practices in response to the information he has provided.

However, where a scientific article may hedge statements with phrases such as "it seems likely that" or "experiments demonstrated that," Gore presents statements as fact (Gross, Harmon, and Reidy). For instance, Gore writes "if we do not act quickly to contain global warming pollution, we will soon barrel right through a doubling of CO_2 and move toward a quadrupling, in which case, scientists tell us, most of the United States would lose up to 60% of its soil moisture" (121). In this example, Gore gives the concepts of CO_2 quadrupling and soil moisture loss as fact, even though they are speculation into the future. He does, however, include an authority that is familiar to any American who regularly reads news headlines, the elusive "scientist" as the ultimate expert. In this way, while the text persuades, it also informs—it convinces by directly telling readers the "truth." Also, there is an aspect of the wonder appeal in the presentation. While the information is meant to persuade, it does so in large part by wowing the audience into stunned belief. In the end, after hundreds of pages that attempt to convince the audience that the Earth is in the midst of a major catastrophe, Gore reassures his audience that "the choice is

ours. The responsibility is ours. The future is ours" (296). After readers have been sufficiently amazed to believe Gore's premise, he allows them some non-scientific, motivational relief before delving into telling them how to change their lifestyle in response to the climate crisis. Finally, in the case of science writing for lay readers, communication happens with members outside the scientific or political environmental field as a result of the need for further public interest in the topic—interest which will hopefully promote not only action, but the funding that is the main goal of so much environmental literature.

This classification as science writing can, as Bazerman notes, quickly delve into technology writing—and it often does. In a way, the argument in AIT becomes an argument about technology. In the text, much of the cause of the climate crisis comes as a result of human use of technology. The solutions seem to be largely technology-based as well: hybrid cars, wind farm electric generators, solar panels, geothermal power stations (277). While the science-based language produces ideas and concepts (e.g. the concept of global warming), the technology-based language produces a material outcome (e.g. using clean energy from alternative power). In this way, the text becomes not only a technology text but also a science text. In addition, by acknowledging that solutions can come about through technology, Gore keeps himself from appearing to be a techno-Luddite and advocating an impractical complete break from technology because it is "bad." By acknowledging that technology can be used not only to destroy the environment but to save it, Gore keeps the focus from being on the evils of technology—an argument which may

seem anti-progress and repel many readers—and instead focuses on the human element of global warming, keeping his argument and solution realistic and thus more believable.

As stated, this mixed genre helps to convince readers of the validity of Gore's argument. The text is aimed at lay readers rather than at the scientific community. However, by incorporating elements from popular science writing as well as scientific and technology writing, and by listing a statement from and the names of "48 Nobel Prize-winning scientists [who] accused President Bush and his administration of distorting science" concerning climate change and thus "threatening the Earth's future," Gore is able to make lay readers feel like they are getting an inside glimpse of the scientific community (268-69). While this attempt to include all possible audience members may actually alienate some readers who are a part of the scientific community that the book somewhat attempts to simulate, this only increases Gore's influence. When conversations began concerning the validity of the science in AIT, in a way it did undermine Gore's argument. However, it also continued the conversation that Gore started—effectively continuing his influence rather than obliterating it. As Steven M. Quiring notes in "Science and Hollywood: a Discussion of the Scientific Accuracy of *An Inconvenient Truth*," "Scientists may argue about the accuracy of the message of AIT, but there is no debating its effectiveness" (3). Regardless of whether members of the audience agree with Gore's conclusions or not, they have to admit that Gore got their attention and got them talking.

CHAPTER 4: CONVENIENT TIMING: *KAIROS* AND *AN INCONVENIENT TRUTH*

Situated *Kairos*: External Influences

By 2006, advocates of the green movement in America were a significant force, but the general public still had not yet been provoked into an environmentally-focused fervor. There was some attempt to rally the public, but much of it was through one-time actions such as those Plevin describes, and these attempts were often aimed only a select audience of those who were already advocates. However, the political, environmental, and commercial situations in the decades leading up to Gore's texts provided him with a *kairotic* moment from which to springboard his arguments to encourage more wide-spread and permanent environmental impact through changing society's habits.

The Political Lead-up: The Birth and Life of the EPA

Since the green movement's inception, its advocates have pushed for politicians to take action to promote environmentally-friendly laws and actions. Laws, acts, and resolutions such as the Air Pollution Control Act of 1955, the Clean Air Act of 1963, and the National Environmental Policy act of 1969 led the way towards increasingly legislated environmentalism (Stoll 156-57). However, these were individual instances rather than a sign of any governmentally-based continuous environment advocacy. In 1970, the same year that the first Earth Day was celebrated, the Environmental Protection Agency (EPA) was established "to

consolidate in one agency a variety of federal research, monitoring, standard-setting and enforcement activities to ensure environmental protection" ("History"). For the first time, rather than advocates pushing one environmental issue at a time through the legislative process, a single government entity was tasked with advocating, promoting, and ensuring positive environmental change.

Since the EPA's creation, it has been involved in an increasing number of environmentally-focused political actions, concerning both issues that impact the environment of the planet as a whole and those that impact human health on a local level. At first, the EPA mainly focused on responding to pollution issues. They regulated chemical dumping in waterways, tested air quality throughout the country, and banned harmful pesticides in agriculture. As time went on, however, they also began to focus more on conservation. In 1991, the Federal Recycling Program was created to "promot[e] and integrat[e] cost-effective source reduction and recycling into waste management programs"; in 1992, the EPA began the Energy Star program to promote energy-efficient appliances and electronics; and in 1993, the Environmentally Preferable Purchasing initiative directed federal agencies to "buy recycled and environmentally preferable products" ("History"). In the few years before AIT, the EPA seemed to be in a phase of focusing on air quality, launching multiple initiatives aimed at reduced vehicle emissions, creating the Methane to Markets International Partnership, and even responding to both 9/11 and Hurricane Katrina by "restor[ing] air quality monitoring networks" and "monitor[ing] air quality" in order to "ensure public safety" and "protect the health

of emergency workers and citizens" ("History"). The EPA's growing recognition and influence helped paved the way for future political parties to continue an environmentally-focused conversation, and their concentration on atmospheric concerns in the years leading up to 2006 provided an excellent backdrop for Gore's presentation on the issue of air pollution and the related issue of global warming.

The Environmental Lead-up: Ozone Holes and Hurricanes

As the discussion about human activity's effect on the planet gained strength through the green movement throughout the late 1900s, so did the focus on the consequences of those changes. A large focus was on temperature changes and their possible effects on weather patterns—specifically on hurricane patterns. In 2001, the Intergovernmental Panel on Climate Change (IPCC) issued the statement that "the global average surface temperature has increased since 1861," when records first began being kept, and that "it is very likely that the 1990s was the warmest decade and 1998 the warmest year in the instrumental record, since 1861" (Intergovernmental Panel on Climate Change [IPCC] 93). The same statement reported that "the sea level rose between 0.1 and 0.2 metres during the 20th century" and that "global ocean heat content has increased since the late 1950s" (IPCC 94-95). This increase in global temperatures, especially in ocean temperatures, was widely considered to be the cause of increased hurricane activity and intensity (Goldenberg, Landsea, Mestas-Nuñez, and Gray 474). The link between rising temperatures and the possibility of deadlier (and costlier) and more frequent hurricanes gave climate advocates, including Gore, a vantage for pushing public

awareness of global warming by linking it directly to human safety and the economy.

In 2004, the reality of increased hurricane activity struck. Florida was pummeled over and over by a record-breaking three major storms that year: hurricanes Charley, Ivan, and Jeanne. A fourth, hurricane Frances, although making landfall as only a category 2 hurricane, produced heavy rains and disastrous flooding ("Hurricane History"). Two of these hurricanes, Charley and Ivan, became the second and third costliest hurricanes in the U.S. after Andrew, with $15 billion and $14.2 billion in damages, respectively (Blake, Rappaport, and Landsea 8). However, 2004 would not be the most disastrous year. The 2005 hurricane season broke even more records. It was the first season with 28 named storms, the first with 15 hurricanes, the first with four category 5 hurricanes, and the first with four major hurricanes making U.S. landfall: Dennis, Rita, Wilma, and the infamous Katrina. ("NOAA Reviews"). Katrina, although only a category 3 at landfall, became the costliest hurricane to ever hit the U.S., costing an estimated $81 billion in damages (Blake et al 8). It also became the deadliest hurricane in nearly a century, causing an estimated 1500 deaths. This made it the third deadliest hurricane in U.S. history, with second place going to a category 4 hurricane in 1928 (Blake et al 7).

The emotional and economic shock not only of Katrina, but of a record eight destructive hurricane hits in only two years left Americans focusing more than they ever had before on the dangers of climate change. The fear sparked by the possibility of widespread destruction left the public looking for answers to the

questions both of how such severe and devastating natural disasters could have happened in the first place and of how to avoid future catastrophe. For environmental advocates, including Gore, this provided the perfect opportunity, an ideal *kairotic* moment, to provoke dialogue about climate and environmental change and humankind's responsibilities toward the planet.

The Popular Culture Lead-up: The Wonder and Risk of Science

In addition to society's growing awareness of and concern with environmental issues, Americans were gaining more and more of an obsession with science, math, and other "objective" subjects and had grown familiar with "scientific" arguments—or at least with the popular culture version of science. The changes that Jean Fahnestock and Dorothy Nelkin describe as information moves from the science community to the lay community continued to hold true for scientific information in the early 2000s. As Nelkin writes, in the 1960s, popular science writing was focused on the "conquests of science and technology"—on the wonder of scientific "breakthroughs" and "revolutions" (8-9). In the 1970s, the concern shifted the consequences of our discoveries and creations (9). Society began to fear the risks involved in new and untested methods, and the tone of science writing dampened to reflect a more cautious approach. In the 1980s and '90s, although society had again focused on what Fahnestock describes as the "wonder" appeal of science, that wonder continued to be tempered with the wariness of the '70s (Nelkin 9; Fahnestock 279).

This developing attitude of both venerating scientific data while at the same time remaining cautious of the consequences of new ideas and technologies set the perfect mood for Gore's scientifically-focused argument about the perils of our modern, technologically-based lifestyle. His audience had grown accustomed to considering scientific facts to be convincing evidence while at the same time maintaining a watchful eye for the negative cost of new developments. By explaining the dangerous and disastrous consequences of human progress through data and facts, Gore took full advantage of the mindset that his audience had been cultivating and had been cultivated into for the past few decades.

Creating *Kairos*: Gore's Preparation

In the years before AIT, Gore built an ethos and laid the groundwork that would give him the opportunity not only to create a successful text, but to gain so much political and popular impact through it that his name would eventually be tied inexorably to the issue of global warming. He was a frequent political advocate for environmental change as a senator and as Vice-President of the United States. In 1989, he authored the World Environmental Policy Act, and in 1990 he helped create the first Interparlimentary Conference on the Global Environment and wrote his first environmentally-focused book, *Earth in the Balance*, which quickly became a *New York Times* bestseller (Senate Historical Office 7). In addition, Gore was instrumental in proceedings at the environmental summit in Kyoto, Japan, which resulted in the ratification of the Kyoto protocol by many countries (Senate Historical Office 12). Although the treaty was unpopular with American businesses

and thus discouraged by the Senate, Gore's influence in its overall success showed his devotion to environmental issues, even when he did not have the backing of the U.S. government.

However, Gore's past did not completely endear him to green-minded audiences. During both his 1988 and his 2000 presidential runs, Gore shifted his focus away from environmental issues in deference to issues that garnered more support for the election (Senate Historical Office 6; Stoll 24). Steven Stoll describes this move as allowing "the opposition [to] define the environment as an economic threat," linking Gore's motives to the same issue that stopped the U.S. from ratifying the Kyoto Protocol in 1997 (Stoll 7). Also, although Gore seemed confident of his own persuasive abilities, with the mentality that "if I could get the spotlight, I could convince people, in whatever region of the country or whatever age group, that I was a person they wanted to vote for," he was often noted for exactly the opposite; he tended to let others take central stage and was sometimes accused of "exaggerating his accomplishments" and adjusting his political tactics to the point that he seemed unsure of himself (Senate Historical Office 6, 10, 13).

Finally, Gore received significant negative press during and following the 2000 election proceedings when he refused to concede defeat pending a hand recount of votes in the pivotal state of Florida. The recount was halted by the U.S. Supreme Court on December 12, and although Gore won the popular vote, he lost the Electoral College vote and the election (Senate Historical Office 14). ABC News political director Mark Halperin said that during this presidential run,

> somewhere along the line, dominant political reporters for most dominant news organizations decided they didn't like [Gore], and they thought the story line on any given day was about his being a phony or a liar or a waffler. Within the subculture of political reporting, there was almost peer pressure not to say something neutral, let alone nice, about his ideas, his political skills, his motivations. (qtd. in Kurtz)

Halperin continues to say that while the negative press was partly Gore's fault, it was a "huge handicap" for him in terms of pubic support (qtd. In Kurtz). This negative press continued long after the election, as the press saw him as "sanctimonious… he has been disliked all along, and it was because he gives a sense that he's better than us" and in response "portrayed him as a serial exaggerator who kept changing wardrobes and identities" (Milbank, qtd. In Kurtz; Kurtz). When Gore decided take himself out of the 2004 presidential run in December 2002, Washington Post writer Howard Kurtz said that the press's praise for this decision was "the most positive press Al Gore has gotten in a long time." The press's view of Gore as a stuck-up politician who was willing to change his views to match his ambitions resulted in a negative public image of Gore—one that made his best quality his willingness not to fight for his beliefs, but to quit when he saw that the cards were stacked against him.

Although he had a history of environmental political activism, with the press itself turned against him, Gore faced significant challenges in rebuilding his credibility among the American public. While he did still have supporters, the

situation that Gore faced in 2006 was not necessarily the most opportune. Because he was still politically influential he had the authority and the noteworthiness to be noticed, but he would be working against negative press and his history of backing down on environmental issues when political issues got in the way. As a result, he began production and publication of AIT with the understanding that he would have to work to make the current situation favorable for both his arguments and for the persona he had created.

Invention-in-the-Middle and the *Kairos* of the Moment: Creating the Text

In "Kairotic Encounters," Hawhee describes rhetoric as "turning" from one moment to another, with the rhetor, the audience, and the rhetoric itself constantly changing, shifting, and evolving to fit each new moment and creating new *kairotic* moments to be fulfilled (17-18). Referencing Gorgias's *Encomium of Helen*, she describes how Gorgias moves between arguments not with smooth transitions but with "a conjunction of forces ('and … and … and … and')" (27). This constant shifting allows Gorgias's speech to move forward and "pick up speed in the middle" (Deleuze and Guattari, qtd. In Hawhee 27). Like Gorgias, Gore moves through AIT in a series of "conjunctive forces" that help to force the arguments along their path. Gore's texts are a series of arguments which, taken together as a whole, allow him to make sweeping changes. Each moment creates an opportunity for a new moment, and Gore wastes no time in charging from one to the next—in "turning" from one argument to another.

In the book, Gore moves between the main segments and the interludes with no transition between. Rather than using a sense of "also," Gore uses Gorgias's "and." He does not transition smoothly between arguments, but rather moves from argument to argument directly and abruptly, stacking them one on top of the other rather than in a smooth line. In one instance in the book, he moves from a chart and description of atmospheric CO_2 levels to a description of his son's accident and then into a chart and description of global temperatures (67-68, 71-72). There is no sign on the CO_2 page that what comes next will be different than that page's straightforward, scientific-looking chart. The closing statement on one page is a description of the ranges of the chart, and the next page starts with "Some events stay with you always," moving from an objective fact-telling section to a more personal, subjective one. (67, 68). Even the background color of the pages changes, from a crisp white to a soothing yellow. With the same abruptness, the interlude about Gore's son ends with an emotional "I can … try to make sure that what is most precious about God's beautiful Earth—its liveability for us, our children, future generations—doesn't slip from our hands," while the next page, back on a white background, starts with the seemingly emotionally-detached statement, "this graph charts the actual measurements of global temperature increases since the Civil War" (71, 72). Each argument in the book moves in this manner, an abrupt change from direct statements to emotional stories or reflections back to direct statements.

Likewise, the movie jumps constantly between an image of Gore on stage in front of a live audience delivering straightforward "facts" and figures to more subtle

images and arguments that convey more personal, emotional information, and it is not only the material within those segments, but the actual movement between the segments that makes the argument. For example, at the end of an onstage segment discussing the growing threat of hurricanes, Gore cites a Winston Churchill quote about the consequences of procrastination (34:00). The scene then cuts away from Gore on stage and shows him looking out the window of a plane contemplatively, with a voiceover about the consequences of making mistakes (34:15). Next, it moves to news clips from the 2000 election discussing the uncertain outcome of the election and showing snippets of Gore winning some states and a news image of side-by-side headshots of Gore and Bush with the caption "too close to call" (34:55). After pictures and images of voters looking at ballots, of poll workers counting ballots, and finally of the Supreme Court sitting down, Gore is shown hugging his wife and others, with the voice over that although he does not agree with the court's decision, he accepts it (35:30). The next scene shows President Bush being sworn in as President of the United States as Gore looks on and claps supportively (35:46). After Bush is shown getting out of an escorted limousine and waving, Gore is shown again looking thoughtfully out of an airplane window, with the his voice saying over the image, "Well, that was a hard blow. But what do you do? You make the best of it… I started giving the slideshow again" (36:00). The scene then transitions back to Gore on stage where he begins to discuss recent worldwide changes in precipitation.

There is no smooth transition between these scenes. Rather the movie seems to jump from one to another suddenly without bothering to make an explicit

connection. However, by moving from the discussion of global warming to statements about dealing with consequences for "mistakes" then to the segment on his 2000 campaign loss, Gore uses invention-in-the-middle to make a subtle argument that is created not by the segments themselves, but by the movement between the segments: Gore's loss was a mistake, and we now have to deal with the consequences of a environmentally hostile administration. These consequences, however, are not only based on the physical danger represented by climate change. By showing the election through his point of view, Gore forms a personal connection with his audience. His personal loss then becomes their personal loss, prompting them to react to the outcome not only with fear of the environmental dangers associated with Bush's win, but also with sympathy for Gore. However, the election is represented as more than a personal ambition. Throughout the movie, Gore has been portrayed as a champion of the environment, of the Earth, and, consequently, of humankind. When he loses the election, the sense is not merely that he has failed to achieve a personal goal, but that he has been blocked from fulfilling this altruistic role.

When Gore says that he "started giving the slideshow again," the air of resignation in the statement makes this seem like "plan B" for fighting for environmental protection rather than as a victorious rebellion against an unfair loss. As president, he would have had the ability to make significant policy changes. However, without the office, he is left to try to make changes based solely (so it seems) on his ability to convince the public to change their actions without

government intervention. This puts him on the same level as his audience, as someone trying to change the world for the better as an individual rather than as a figure of power. Combined with the personal loss, this allows him to almost portray himself as a type of martyr. Although he suffered, he keeps the good of his fellow humans in mind and continues to fight for them rather than wallow in self-pity over his defeat. Although the press had seen and portrayed him as vain and "waffling" during and after the election, the resigned but determined tone of the simple phrase "I started doing the slideshow again" allows Gore to build an image as a selfless defender for his audience rather than a politician intent on (re)building a persona simply to win public votes. The sense that has built up over not necessarily within the scenes themselves, but in the movement between the scenes has been that Gore not only deserved the presidency, but that his win would have been a victory for the entire human race. Instead, the "mistake" of Bush's election pushed Gore to advocate for the environment alone through the slideshow. What is said simply shows Gore's personal defeat and stoic persistence; what is unsaid but nevertheless clear is the implication that this makes him a lone warrior for his audience and therefore someone to be admired and followed.

As Gore makes his argument through the turns within his texts such as those mentioned above, he makes constant adjustments for and to each particular moment. As the immediate *kairos* changes, he reacts by adjusting his character and his methods to ensure the greatest effectiveness at each unique instant. In doing so, he is created by the text, just as the text is created by him.

Building and Rebuilding an Ethos

As mentioned above, Gore begins AIT within an ideal moment for his topic as a result of the political, climate, and popular science build-up, but with a less than ideal personal ethos. Rather than attempt to avoid his audience's negative prejudice, however, in both the book and movie versions of AIT, Gore immediately introduces one topic that had garnered him the most negative press: his unsuccessful 2000 presidential run. In one clip at the beginning of the AIT video, he begins a presentation by saying, "I am Al Gore. I used to be the next president of the United States." After the audiences claps and chuckles he says, with a smile and an air of satire, "I don't find that particularly funny," eliciting laughter from his audience (2:17). He immediately uses comedy to attempt to dispel any negative thoughts the audience has as a result of the election so that he can make room for his main topic of global warming. Likewise, the scenes mentioned above describing the election story allow Gore to build his good nature and goodwill towards the audience by showing his humble and gracious reaction to defeat and his willingness to move on and try to make the best of the seemingly unfair situation by crusading for the future of humanity.

In the introduction to the book, Gore confronts the issue head on; he acknowledges that losing the election was "a hard blow" but couches it in terms of the outcomes for environmental politics rather than for his own personal goals (8). The paragraphs leading up to the 6-line description of the election all discuss Gore's experience in environmental politics. He says, "I discovered, firsthand, how fiercely

Congress would resist the changes we were urging them to make … I organized and held countless events to spread public awareness about the climate crisis … I helped achieve a breakthrough at the negotiations in Kyoto" (8). The description of the election itself starts with a simple, "in 2000 I ran for president," and the paragraphs following the description focus on the negative effects of the Bush administration:

> It became clear that the Bush-Cheney administration was determined to block any policies designed to help limit global warming. They launched an all-out effort to roll back, weaken, and—wherever possible—completely eliminate existing laws and regulations. Indeed, they even … announc[ed] that, in the president's opinion, global warming wasn't a problem at all. (8-9)

The combination of the list of Gore's achievements along with the downfalls of the Bush administration illustrates the idea that Gore would have been a more environmentally friendly president than Bush, building Gore's connection with the audience as a "natural" leader who considers their well being a top priority.

When discussing the personal effect of the loss, Gore jokes that he "was out of a job" but says that he had "the chance to make a fresh start" and continues to passionately tell of his career as an environmental activist since the election (9). While his past successes as an environmental advocate help him to build an ethos, his past failure is what gives him an opportunity to initially connect with his audience—an opportunity he takes full advantage of willingly and skillfully. By acknowledging a topic that his audience considered one of his weak points and discussing it in terms and viewpoints that make the defeat seem linked to the

audience rather than only to Gore personally, he keeps the audience from focusing on his faults and draws them into a discussion of environmentalism rather than a critique of his career.

Multiplying Identities

While Gore manages to begin the texts by building strong ethos and forging the first connections with his audience, as Hawhee notes, a rhetor's identity and ethos are not fixed. Rather, as a rhetor creates an argument by turning between the *kairotic* moments, he or she is transformed (23). The rhetor not only creates new arguments, but is actually constantly recreated by the interactions between moments and by the "middle voice" that allows movement between those moments (17). The idea of invention-in-the-middle becomes not only an idea of the rhetor inventing the argument as he or she moves from moment to moment within a text, but of the rhetor changing his or her identity in response to the ever-changing rhetorical situation. As Hawhee describes it, the rhetor must acknowledge that "'I invent' in the middle becomes 'I invent and am invented by myself and others' (in each encounter)" (17). With this transformation comes a transformed identity and a transformed ethos. As Hawhee says, the rhetor "cultivates an ethos that morphs" as the argument continues to shift and transform the rhetor (23). As Gore moves through his text and "turns" from one subject to another, he transforms his character to fit the need of the particular moment and in the process adjusts his ethos for his new character.

Gore's main roles in AIT, both in the movie and book, are as teacher and as a sort of prophet. As mentioned above (chapter 3), in much of the book, Gore's style is straightforward explanation, or teaching. He takes the air of someone with knowledge to impart on those less wise and gives this information through direct statements, often explanations for accompanying images, such when he explains that "the red splotch marked 2002 is the Larsen-B" (180). Mixing familiar language ("splotch") with factual information (the formal name of the ice shelf) allows Gore to explain new information to his audience in an understandable manner, much as a conscientious teacher would instruct his or her students in a complicated subject. In the movie, he takes a similar tactic, often giving information in authoritative, direct statements. In addition, in the movie Gore is often shown on a stage in front of an audience, explaining charts, graphs, and trends and occasionally showing cartoons. The scene is reminiscent of a stereotypical college lecture, with attentive students in a small auditorium listening to the all-knowing professor explain complicated information in easy-to-understand connected bits and pieces. In both the book and video, Gore's mannerisms and style allow him to instruct his willing students and to gain the authority and role of a teacher.

Occasionally, however, Gore's attitude and methods shift and he becomes a harbinger of consequences for those who fail to heed his warnings and a moral leader through the uncertain future. This role appears in the book when Gore switches from his straightforward, subdued style to the grand style. As a teacher, Gore relates facts and information directly and his students (the audience) are

expected to react by absorbing the information. However, when Gore shifts to the grand style, he is no longer simply providing information for consumption. He becomes a revolutionary leader calling for action from his dedicated followers. For example, when discussing the decreasing thickness of the ice in the Arctic, Gore at first simply relays information, such as the statement "since they can surface only in areas where the ice is three feet thick or less, the Navy has kept a meticulous record of ice thickness measured by upward-looking radar" (142). However, by the end of this section, he says, "if we continue with business as usual, the Arctic ice cap will completely disappear each during the summertime… Preventing its disappearance must be one of our highest priorities" (143). At other points in the text, Gore makes action a moral imperative, such as when he says, during a discussion of the increasing world population, "we have a moral obligation to take into account this dramatic change in terms of the relationship between our species and the planet" (216). At these points, Gore momentarily ceases to be a teacher and instead becomes a leader, explaining consequences and guiding his supporters in a new direction.

In the movie, in the scene corresponding to the aforementioned sequence on the ice caps, Gore begins by describing changes that have already taken place, such as the crack in the Ward Hunt ice shelf, the largest in the arctic, and showing images and graphs that demonstrate the increasing fragility of the ice caps (42:13, 43:09). He then explains the mechanics of the melting ice caps' melting and shows a cartoon polar bear struggling to climb on a small, breaking piece of ice (44:30, 45:18). He

ends the section by saying, “but what does it mean to us to look at a vast expanse of open water at the top of our world that used to be covered by ice? We ought to care a lot” (45:40). He moves from teaching facts and giving direct statements to a cartoon that draws sympathy from the audience, encouraging them to react emotionally as well as rationally to the arguments presented. The end takes advantage of this emotional response by prodding audience members to become personally invested in the issue, partly by “caring,” which simply continues the sympathy they have already developed for the polar bear and extends that sympathy to include the ice caps themselves. At this point, Gore is no longer only giving information, but is actually telling his listeners what they should care about, what they should consider important. Again, he has changed from a teacher of facts to a forecaster and moral guide, and he just as quickly transitions back to teacher once his appeals have been made.

In addition to his teaching and predicting, throughout the texts Gore attempts to connect personally with the audiences through personal stories of his colleagues, friends and family, and his own experiences and, in the movie, the occasional slip on stage from identity as teacher to one of a fellow “average” person. One of these momentary slips in the movie happens as Gore explains the chart of CO_2 levels and their correspondence to temperature. For dramatic effect, he uses a mechanical lift to raise himself up to where the amount of modern day CO_2 levels is pinpointed on a wall-sized image. As he gets on the lift, he breaks from his teaching identity to say, “if you’ll bear with me … the crew here has tried to teach me how to

use this contraption here, so if I don't kill myself I'll…" as he fumbles with the controls to raise the platform (23:00). Once the platform has reached the desired height, Gore switches back to teacher, saying, "it's already right here," pointing at the yellow dot on the chart (23:16). This fumbling and seeming incompetence allows the audience to connect with him as a fellow "incompetent" and thus normal person who isn't always proficient with technology. However, as the chart moves higher to predicted CO_2 levels, Gore raises the platform again, this time without seeming to think about it (23:45). As he continues to speak, he, again without any apparent effort, lowers himself and is next shown standing on the ground again (24:16). The audience does not seem to notice that Gore is now fully proficient with the machine that he claimed ineptness with earlier. As Gore's role changes from teacher to companion, they respond with laughter to his apparent inadequacy, but once he is back to the identity of teacher, they do not seem to question his seemingly newfound capabilities. He is back to unquestionable authority. However, that subtle "slip" into companionship with the audience allows them to connect with him and remain personally invested in hearing his arguments.

Most of Gore's attempts at personal connection, however, are much more apparent. The introduction of the book begins with Gore describing how his child's near-death accident made him adjust his priorities both in his family and his career life (8). By immediately identifying himself as a parent, Gore reaches out to members of his audience who each have their own unique understanding of the parent-child relationship and who, by seeing Gore's story through their own lens of

understanding, are able to connect personally with him. He continues this method at various points throughout the book, telling stories about one of his college professors, his childhood on his family's farm, and his father's influence (38-41, 122-25, 210-13). In the video, the scene often breaks from the scene of Gore on stage to one of him travelling and telling personal stories. As he drives through the countryside, he tells the audience about growing up on the family farm, learning to raise cows, and accidentally wrecking the family car on the side of the road as a teen (39:30). In another instance, an image of a friendly-looking man in a suit is introduced as Roger Revelle and Gore's college yearbook picture is displayed, followed by scenes of students in a stairwell and studying in a library as Gore reminisces abut about his "wonderful" days as a college student and his role model, Professor Revelle (11:57, 12:58). Finally, he is shown standing in the abandoned shell of an old barn looking thoughtful while his disembodied voice describes his sister, her death, and their father's subsequent halting of tobacco farming (1:09:55-1:12:00). All these stories prompt elements of shared human experience that can help Gore's audience relate to him on a personal level: relationships with role models and family members, wistfulness for childhood innocence and energetic youth, and the pains and joys of growing up and trying to make a difference in the world.

While in the book the interludes take on an air of storytelling, in the movie it often almost feels as if the audience is secretly witnessing Gore's private thoughts and memories. The effect of both methods is that the audience is frequently

reminded of the human element behind the statistics and images, and the spacing of the stories throughout the texts allows Gore to keep the audience emotionally connected to that persona and thus personally invested in the topic. He reaches for a personal connection with the audience again and again by claiming an identity that audience members can also claim—family member, student, concerned citizen—and by doing so draws the audience into dialogue not just about common experiences, but about his main argument of environmental change. Although some interludes do not necessarily connect him on a personal level with the audience, such as the description of his journey to the arctic poles in the book or the scene of him doing research on the internet and getting information over the phone for his presentation in the movie, they help build his ethos as a devoted expert; they are accounts of first-person research and involvement (138-41; 1:13:55).

By moving back and forth between the identities of aloof teacher and fellow human, Gore is able both to maintain an air of authority that convinces the audience to listen to his arguments and follow his instructions and to enable audience members to connect with him on a personal level, increasing their ability to empathize with his crusade. The identity adjustments that Gore makes at different moments within the texts enable him to build not one but multiple effective ethos which support and strengthen each other and make his argument more convincing both logically and pathetically.

Changing Dunamis

Along with this change in identity comes a change in the effectiveness of the argument. The *dunamis*, or capacity to effect change, of speech is, according to Hawhee, speech's "most prominent characteristic" (29). However, *dunamis* is not static. It changes and adjusts in accordance with the relationships between the moments within the text. This adjustment in effectiveness is something that Gore is aware of as he moves through his arguments. Before an argument or method begins to lose its *dunamis*, Gore moves to a new topic, a new moment, in order to let the audience level emotionally so that the argument will again have a powerful effect when Gore comes back to it. Gore's method of interspersing interludes within the text not only allows him to appeal to his audience's emotions and evoke personal connections, it also allows him to, in a way, recharge the *dunamis* of his main argument. As described above (chapter 3), in the book version of AIT, each section builds the reader up to an emotional high point before leveling out with a personal story, and the next section begins from a higher emotional point than the previous section started at and builds up higher than the previous section had before another interlude. The interludes allow the environmentally focused main argument to continue to be effective long after it would have if it had gone on uninterrupted.

The movie follows similar tactics. Rather than moving directly through an argument focused on global warming, which would eventually lose its force, Gore sprinkles the standard scene of his presentation in an auditorium with other scenes and stories. Many of these show Gore travelling: going through airport security,

driving through the countryside, looking out an airplane window, riding in the back of a car and talking with the driver. These scenes sometimes portray Gore's reasons for making his arguments, such as when he describes the connections he felt with nature as he grew up helping his father on the family farm; they sometimes build his ethos as an authority, such as when he describes how he studied environmental trends as a college student; or they sometimes discuss his past, such as the scene of his defeat in the 2000 election.

However, an interesting difference between the book and movie is in the make up of the main argument and interludes. In the book, the main argument is often made through images: through pictures, graphs, and computer-generated images. There is minimal text on these pages, with a majority of the force of the argument coming through the audience's reaction to the images. The interludes, however, are mostly text with some interspersed images. The interludes, in a way, provide more information than the main argument. In the movie, however, the central scene is Gore standing on stage discussing pictures, charts, and graphs that appear on the screen behind him. While the images are often the same ones that are shown in the book, the main focus is not the images themselves, but Gore's explanation of their significance. The audience is focused on Gore's discussion. For example in the book, a red zigzag line depicting concentrations of CO_2 is show relentlessly and alarmingly rising across a two-page spread (36-37). The image itself is the main focus, with the explanatory text taking a supportive rather than main role. In the movie, the same image is used. However, the zigzag does not

appear all at once, as the one in the book must. Instead, the line slowly snakes its way up the screen next to a reassuring image of the earth's atmosphere "breathing" as Gore discusses how he was advocating for the environment at each chronological point in the graph (15:00-16:10). He speaks the entire time, and the focus is on the information that he is giving, rather than mainly on the graph, and he gives quite a bit of information that the audience must pay attention to. Throughout the slideshow, he continues this trend.

The interludes, however, are a different story. During the movie's interludes, Gore speaks more slowly, in shorter sentences, and often stops speaking completely for short times to allow the audience (and himself presumably) time to think about the images and story being related. When he discusses his sister, Nancy and the family's involvement with tobacco, he gives much more detail in the book than in the movie. Where the main *dunamis* of the book comes not only from the information given but from the audience's emotional response to the images, the information-heavy interludes provide a counterpoint that allows the audience to, as it were, take a calming breath by thinking of something else momentarily. However, in the movie, the *dunamis* comes from the flood of information that Gore pushes towards his audience, and the slower-paced, image-heavy interludes of the movie allow the audience to stop taking in information momentarily. In each case, by moving to a different method, Gore gives his audience a chance to lose some of the tension created by the main argument so that when he moves onto the next section

of the main argument, he maintains the force and influence necessary to remain convincing.

Fellow Shifters: The Audience

Hawhee says that it is not only the rhetor, but the audience who is changed by the turns within a discourse (28). Thus, as Gore and his texts change in response to each other, the audience is likewise changed and must make their own adjustments in order to keep up with the fast-paced, constantly shifting arguments, identities, and *dunamis*. In the movie, when Gore is a teacher, the audience present in the auditorium sits passively and attentively, "learning" the information he is relating. When he changes his tone and becomes a moral guide, telling his audience what is important, the audience members often clap as if to show their solidarity with his claims, and at the times when Gore tries to connect with the audience personally, they seem to identify as his companions, laughing with him. As the audience reacts to each individual moment, they signal to Gore how effective his current method is or isn't.

As Gorgias points out though, the effects of speech cannot be known in advance (Hawhee 29). When the audience does not react as Gore expects, it seems to prompt him to change his tone (and thus identity to a degree) from what he had been planning. One example is when he describes the "drunken trees" in the arctic. Before he begins describing the trees, he has the identity of "teacher." As he starts describing them though, his tone seems to become somewhat jocular as he gives their name, as if he is trying to become a momentary companion to his audience

(42:16). He pauses for a second, but the audience does not seem to respond. He then says that the trees' leaning is "not caused by wind damage or alcohol consumption," which elicits a quick chuckle from the audience, but he then moves quickly on before allowing a complete tone change or letting the audience relax into familiarity (42:20). Unlike the instance with the mechanical lift, it seems as though the audience fails to adjust with Gore. In the former moment, the audience responded to Gore's identity as a normal person by laughing and momentarily becoming his companions, enjoying a joke with him. At this moment though, rather than becoming his companions when he expects, the audience members remain students. This prompts Gore to maintain his teacher identity rather than allow himself to make the full transition into companion that he allowed previously.

In the book, Gore is not able to make these momentary adjustments as he does in the movie. When the audience reacts to the book, Gore must maintain the identity that he has predetermined for each moment. However, as he moves between his arguments and stories, he does allow the audience time to make their own adjustments. The audience begins the book with the identity of Gore's companions as fellow humans. He tells a story of his own experiences that the audience might be able to relate to, then concludes with statements that use "we" and "us" rather than "I" or "you." Gore invites his reader to consider "our children" and says that "we can answer [our grandchildren's] questions now by our actions, not merely with our promises. In the process, we can choose a future for which our children will thank us" (11). The next few pages show the Earth, along with text that

says one image is “the first picture most of us ever saw of the Earth from space” and calls the Earth “our planet” (12, 15). This inclusiveness allows the audience to connect with Gore as equals and to take on the identity of companions. However, he also begins to identify himself as a teacher and, thus, to give the audience the identity of students, as he moves from inclusive language into fact-telling, such as describing in simple terms the mechanics behind an eclipse (15). This immediately puts the reader into “student” mode, reading and learning facts. This becomes their main identity throughout the text.

He does not often return to using pronouns like “us” in the main text. When he does, it is as the moral guide or leader, and he prompts readers to respond not by becoming his companions, but by becoming his followers. Questions such as “How do we debate something as cataclysmic as this in the traditional framework of our political dialogue?” do not prompt readers to become colleagues and provide a authentic dialogue, but rather to give the answer that they know Gore is looking for (121). In this case, readers know the answer Gore is prompting: “We can’t.” In these cases readers become not equals, but followers, providing their guide with the “correct” answers, even if those answers are provided silently. Simply by knowing the answer Gore is prompting, readers obey Gore’s sometimes subtle, sometimes overt commands. When he says, “we ought to care about this a lot, because it has serious planetary effects” readers, at least momentarily, do care as a result not only of this statement, but also because of the full-bleed image of a polar bear mother and cub that Gore has just described as being in serious mortal danger (146). The

audience, even if only for an instant and even if only mentally, tends to become Gore's followers when he takes on the identity of guide.

The interludes that interrupt the text allow the audience to temporarily shift from these identities as students and followers. As explained above, the interludes in the book, while only a few pages long each, include much more information than the main text. This length allows readers to gradually shift identities rather than making a sudden change that might fail, as Gore's attempt with the drunken trees in the movie did. The interludes follow the pattern of the introduction, beginning with Gore telling a story of one of his experiences before ending with inclusive language that allows the reader to feel companionship with a fellow person. For example, in the interlude titled "Across the Wilderness," Gore begins with stories of his family's camping trips and how much they enjoy nature; moves to addressing the audience directly, with statements such as "if you never put yourself in the midst of nature… then you're inclined to treat it as trivial"; and ends with inclusive statements that put him in a group with the audience such as "what we do to nature we do to ourselves… we have to act affirmatively to stop the harm" (158-61). The next pages go back into fact-telling and put readers back into their identity as students. The slow adjustment from fact-telling in the sense of Gore telling his personal stories to inclusiveness allows the reader to comfortably make the transition to companion. However, the sudden shift back to student is acceptable since this is the main identity readers have assumed for the text; the identity as companion is the temporary, unnatural one, and so must be created with greater care in order for the

transition to occur smoothly. Although the identities that Gore prompts his audience to take on may not last beyond the final page or after the theater lights turn back on, while the text is presented, even the skeptics in the audience tend to adjust with Gore at each individual moment—no matter how short-lived that adjustment is.

Turning, Turning, Turning

As the texts move forward, Gore must not only make new arguments, he must also allow himself to be changed as a rhetor to fit each new situation. He is able to use Gorgias's "and" to stack his arguments seemingly haphazardly rather than lining them up neatly, and in the process constantly reinvents himself and his audience and creates ever-changing, new *kairotic* moments. With each new moment come new expectations from the audience and new effective methods and styles, with the result that each player in the situation must make constant adjustments. Gore, chameleon-like, expertly transforms for each new instance, adjusting his character to perfectly fit the identity that will achieve his goals for each particular situation without drawing attention to the shift. This ability, along with his ability to lead his audience in their own transformation without making them explicitly aware of the guidance, gives Gore the power to push his environmental argument further than previous arguments had managed to venture and, in the process, gives him the *dunamis* to make himself and his texts universally familiar throughout the country.

The New Moments: Opportunities After AIT

While Gore was able to respond to an effective moment to begin AIT and to work from that moment to create and work with new *kairos* throughout the text, his *dunamis* did not end with the credits. AIT not only became successful itself, earning Gore and the IPCC the Nobel Peace Prize in 2007, but created new *kairotic* moments for other texts, both that agree with and disagree with Gore's claims (Jacobson 3). AIT seemed to open the floodgates on environmentally focused dialogue. For example, *GeoJournal*, an academic journal aimed primarily at human geographers, published a "forum" of "four papers discussing the scientific accuracy of AIT" in order to "address whether AIT accurately presents the scientific argument that global warming is caused by humans" (Quring 1). Some of the articles were in complete agreement with Gore, stating that although "some aspects of the film … oversimplify the complex factors involved … it is not in question that continuing emissions of greenhouse gases by human activities will cause greater climate change in the future, and that the impacts of such change are likely to be negative" (Steig 5). Some said that the movie had "inaccuracies and exaggerations" but "on the whole it represents mainstream scientific views on global warming" (North 27). Others claimed that "the real inconvenient truth is that science has no idea how much of recent warming is natural versus the result of human activities" (Spencer 11). On the whole, *GeoJournal* seemed to represent the country's reaction to AIT: some were wary but accepting, some were skeptical, and some were wholeheartedly in accordance with Gore. However, regardless of whether everyone was in

agreement with Gore's arguments or not, one thing was certain: he got America's attention and created a *kairos* for the green conversation to fill.

Press

Although Gore had been a hot topic in the press during and immediately after the 2000 presidential election, afterwards, especially in the aftermath of 9/11, Gore was no longer a front-page story for most news outlets. However, when AIT was released, he quickly regained the spotlight in what one journalist called the "magical mystery comeback tour of Al Gore" (Rich). The movie and book release sparked waves of public opinion, controversy, and speculation that once again brought Gore to the forefront of major news networks.

The press surrounding the movie and book of AIT has been both praising and incendiary. One *New York Times* article preceding the movie and book release calls the book "a user-friendly introduction to global warming" and says that "'An Inconvenient Truth'" [sic] (the book and the movie) could play a similar role in galvanizing public opinion about a real and present danger…. it might even push awareness of global warming to a real tipping point — and beyond" (Kakutani). A review of the movie in the same newspaper calls it "a horror movie—and it turns into a cult hit" and says that "getting anyone to voluntarily endure 100 minutes of Al Gore and his slides is a historic cinematic achievement" (Tierney). Some saw Gore's texts less as a push for conservation and more as a political move to gain him popularity before a 2008 presidency campaign (Rich; Cooper). Although Gore had already voluntarily dropped out of the 2004 election and explicitly denied any

intention to run for president again during an interview on *Larry King Live*, speculation continued to circulate through the press up until election time (Gore, Interview). However, regardless of rumor or speculation, Gore seemed to have completely shifted his focus from political ambitions to his environmental crusade.

Debates also began in the press about the accuracy of AIT. A *USA Today* article gave the movie "five stars for accuracy" according to "the nation's top climate scientists" while *ABC News* reported that a British High Court declared that the movie contained "nine significant errors" that were included in "the context of alarmism and exaggeration" (Borenstein; Baram). The reported inaccuracies, combined with Gore's identity as a politician and the speculation surrounding his possible political motives for the texts, sparked another controversy that the press gladly seized upon: whether AIT should be used as an education text in public schools. The British High Court case highlighting the "nine significant errors" was part of a push by Steward Dimmock, a Dover school governor and father of two school children, to remove AIT from British secondary schools (Baram; "Gore Climate Film's Nine 'Errors'"). The presiding judge, Justice Burton, ruled that the film could still be shown in schools as long as teachers provided "guidance giving the other side of the argument" by "point[ing] out controversial or disputed sections" ("Gore Climate Film's Nine 'Errors'"). Earlier the same year, the Federal Way school district in Washington state made headlines for the same issue. After parents complained to the school district about AIT being shown in classes, the school district imposed a moratorium on showing the movie, followed by the

decision that AIT could be shown if teachers "point out the biases, and present additional information and perspectives to balance those biases" (Solomon). Both of these cases sparked not only public controversy, but extensive press coverage.

Not only did AIT receive press coverage of its own, the public debates and political and scientific controversy surrounding the film helped turn it and its topic into common knowledge around the country. Regardless of whether audiences agreed with Gore's claims or not, within a year of the film's and book's releases, those claims had been spread across the country not only through the film and book, but by the press who recognized an opportunity to gain readership by reporting on an issue about which both supporters and skeptics were willing to loudly voice their opinions.

Business

Businesses did not want to miss the opportunities either. Businesses that were not directly related to the green movement realized that by moving towards more environmentally friendly policies they could gain consumer confidence and increase sales. Publix Grocery Stores, for example, announced on May 17, 2007 that they would be opening Publix GreenWise Market stores throughout Florida, with the first set to open in the fall of that year ("Publix Expands Pilot Programs"). While part of the exigence for these stores was a response to growing concern with healthy eating, a large part seemed to be the need for the chain to promote an environmentally friendly ethos in response to the public's new interest in environmentalism and climate change. GreenWise Markets are advertised as "all-

natural, organic, earth-friendly" stores ("Publix GreenWise Market"). The website states GreenWise products cannot include "chemicals that adversely affect the environment, and that leading earth-friendly producers are avoiding, such as petroleum, phosphates, and chlorine bleach" and that they are "recyclable, biodegradable, ozone safe, [and] made with recycled materials" ("Earth-Friendly"). Even the name and look of the GreenWise logo are designed to promote thoughts of the natural origins of the brand's products: the word is a light brownish green color reminiscent of woodlands and looks like it is handwritten. The logo seems to reject the stereotypical clean-cut, industrial style of many other chains as unnatural. A green handwritten logo, on the other hand, feels much more "natural," encouraging eco-conscious consumers to choose GreenWise Markets over other options.

Green-based businesses that had existed before AIT seemed to experience a boost from consumers as well. One of the most directly linked industries is that of carbon offsets, which are marketed as "the only way to get your carbon footprint to zero today" ("How Carbon Offsets Work"). Carbon offset companies allow consumers to buy "carbon credits" to offset their carbon emissions. These credits supposedly go toward "third-party validated offset projects" such as building and maintaining wind farms or revitalizing forests ("How Carbon Offsets Work"). Although carbon offsets had been available for purchase before AIT, In a 2010 study, Grant D. Jacobson found that following AIT's release in theaters, carbon offset purchases within a ten-mile radius of zip codes where the movie was shown increased by 50% within the first year after the showing, compared to purchases in

areas further away (21). The two groups showed similar buying patterns before the movie was released, suggesting that there was an "overall change in public opinion and behavior" in the year following AIT's release (22). Jacobson also found that the number of Americans who believed global warming was caused by human activities grew from 41% to 50% during the time that AIT was being shown in theaters, suggesting that the newfound carbon credit buying spree was based on a change in personal views (22).

While these are only two examples of companies who leaped at the *kairos* created in the wake of Gore's film, they are symbolic of a sweeping change in the mindset of American consumers and businesses. The environmentalist views fueled by AIT continued to gain strength in corporate markets over the next few years. Where previously, primarily green-focused businesses and advocate groups were the main push for environmental responsibility, mainstream businesses began joining the cause in order to take advantage of the new popularity of eco-friendliness, and thus take advantage of increased consumer trust and loyalty. Today, many stores, including Target and CVS, give customers a discount as an incentive for using reusable bags instead of plastic bags (Horovitz). Box chain stores like Wal-Mart sell reusable bags at every checkout aisle. Businesses from grocery stores to office supply stores offer recycling services for anything from plastic bags and egg cartons to ink cartridges and cell phones. Car commercials from companies like Toyota, Honda, and Nissan focus not only on power and design but on low emissions and environmental responsibility. The green revolution has hit

mainstream, and businesses are doing their part to lure customers by assuring the public that they are eco-friendly and environmentally responsible.

Environmentalist Groups

With this growing public belief in and concern with climate change, environmentalist groups increased their activity in the years following AIT's release in order to take advantage of the opportunity to gain new advocates. For example, in 2007, the World Wildlife Fund organized a new promotion to take advantage of revitalized environmental interest: the first Earth Hour in Sydney, Australia ("About Earth Hour"). According to the Earth Hour website, that first year "2.2 million individuals and more than 2,000 businesses turned their lights off for one hour to take a stand against climate change." The next year Earth Hour became an international effort and by 2011, 135 countries participated in turning off lights for one hour at 8:30 p.m. on March 26th, making headlines around the world as lights went out on national monuments, including Australia's Opera House in Sydney, the Acropolis in Athens, "Beijing's Bird's Nest stadium, which hosted the 2008 Olympics, the Eiffel Tower in Paris, the London Eye Ferris wheel, Times Square in New York and Brazil's Christ the Redeemer statue" ("About Earth Hour"; "Earth Hour Circles the Globe"). In 2011, the organization increased their push and asked participants to "go beyond Earth Hour" by pledging their commitment to "ongoing action for the planet" ("About Earth Hour").

While not everyone agreed with Gore's arguments or motives, he did help fuel the fire of environmental activism and in the process helped create a *kairos* for

renewed, or sometimes completely new, sustainability efforts. The opportunity Gore created was not only opportunity for change; it was opportunity to profit from change. Whether that profit came in the form of increased public awareness or increased sales, many organizations seized this chance to make the suddenly widespread popularity of environmental advocacy work for their own individual goals.

Conclusion

Gore took advantage of a unique point in time that allowed AIT to have a tremendous impact. The country was still reeling from the impact of two devastating hurricane seasons in a row, including hurricane Katrina, one of the most destructive hurricanes to hit in nearly a century. In addition, the focus of environmental advocates and the EPA had been moving more and more towards a focus on the atmosphere and air quality, and American culture had grown used to absorbing scientific information with a sense of amazement mixed with trepidation. The mix allowed Gore to present a topic that the country was willing to listen to (and sometimes vehemently debate) in a manner that allowed them to fit his presentation into a familiar format that balanced the wonder and fear of science. While this provided him with a *kairotic* moment to start with, his skillful ability to constantly adjust and adjust to each new moment within the text gave him the power to draw his audience into the conversation, whether they agreed with his claims or not. This opened opportunities for others to continue an environmentally-centered conversation that, while it had been happening in select groups or at

certain times previously, had not previously enjoyed the cultural legitimacy that it has now gained. The examples here, while not fully inclusive, begin to highlight the extensive adjustments and changes that were spurred by the publication of AIT. As author Thomas Friedman says, "green has hit Main Street." Gore's name is forever linked to the issue of global warming in the public mind, but his legacy is more widespread—his influence revitalized the entire green conversation.

CHAPTER 5: COMMUNICATING SCIENCE: IMPLICATIONS OF *AN INCONVENIENT TRUTH*

As discussed above (chapter 3), Gore's *An Inconvenient Truth* is not just a political or environmentalist text; it is a science writing text. While at first AIT may seem unrelated to most popular science writing that we are accustomed to today, in terms of rhetorical strategy and *kairos*, AIT provides a telling example of how science writing texts can convince audiences to accept or reject new scientific or technological ideas and to act on the information and viewpoints given. Scientific writing, writing done within the scientific field for an audience that is part of the scientific discourse community, depends heavily on rhetorical strategies as discussed by multiple researchers including Alan Gross, Randy Harris, James Campbell, Carolyn Miller and others. Popular science writing depends on *kairos* and rhetorical strategies as much as or more than scientific writing and even influences the *kairos* that scientific writing and science itself must respond to.

The Buildup: External Influences on *Kairos*

Politics and current events play a major part in setting up the *kairos* that any new science or technology writing can and must exploit. Gore was instrumental in creating a political background that would be favorable for his argument, even before he had the intention of creating AIT. Throughout his career he pushed for environmentally friendly policies and made the topic a frequent political discussion point. Because of this background, AIT had a political niche to fill when it was finally

produced. While all science writers may not have the background to create a favorable political environment for discussion of their topic themselves, the scientific topics that are popular in political discussion tend to also become topics that science writers know will garner an audience.

One issue that has regularly been highly politicized is space exploration. Developments in rockets and spaceflight are not only scientific or technological issues, but issues of international policy. The report "A Chronology of Missile and Astronautic Events" from the Committee on Science and Astronautics in 1961 includes not only significant launches and technological developments, but also political and military issues that impacted the space program. For example, the entry for March 15, 1944 records that "Dr. Warnher von Braun was arrested by the S.S. for overconcentration on space travel rather than military missiles problems. He was later released on the grounds that his services were indispensible" (7). The record for February 6, 1954 claims that "the Soviet Union published the charge that United States science fiction, films, publications, and broadcasts were a forerunner of new imperialism aimed at conquering other planets" (18). On March 4, 1956, it is reported that "Dr. Warnher von Braun saw the U.S.S.R. working hard to develop a manned space ship and said the United States had no time to lose" (25). Throughout the report there are also mentions of the U.S. Air Force's, Navy's, and Department of Defense's impacts on rocket and spaceflight study, as well as the results of and implications of numerous political declarations regarding allocations, progress, and expectations that impacted the program.

The October 4, 1957, entry, the date on which Sputnik I, the first man-made satellite in Earth orbit, launched, is the longest and most detailed entry up to that point, taking not two to five lines like most of the records, but nineteen lines and describing details such as the satellite's weight, length, makeup, orbiting location, and radio transmission frequencies. No other entry is as detailed or lengthy until the 21-line report of the launch of Sputnik II, the Soviet space vehicle that carried Laika the dog into space (34). The entries for both Sputnik I and Sputnik II end by saying that the satellites were "presumably" disintegrated upon reentry into the atmosphere (32, 34). The detail devoted to these entries indicates the high level of importance that the U.S. government placed on the launches, not only as historical events, but as events with political ramifications. The word "presumably" gives another clue about the political nature of the issue. The Committee could not trust the accuracy of Soviet reporting. The introduction the report makes this sentiment clear:

> It should particularly be emphasized that there is no absolute way to check the accuracy of every Soviet claim which has been included. These and many other uncheckable items have been included nevertheless because of their general usefulness, and whether all of them are accurate or not, their appearance at the time became factors in policy making, and therefore their place in history is legitimate (2).

Although the committee members could not be certain of the accuracy of the scientific or technological information, the issue was so highly politicized that

merely the report of developments were deemed significant, whether they could be confirmed or not.

The atmosphere of political competition that was already present was enhanced by missile development during WWII and led to increased drives after the war to remain in the lead in missile and spaceflight development in the name of national supremacy and defense. The scientific and technological developments of the space race were fueled not only by public interest, but by political interest as well. This helped create a *kairotic* space for later developments such as the moon landings and the space shuttle program. The political *kairos* allowed both the U.S. and its competitors to enter the "space age" at full throttle.

A more recent example of the impact of politics on *kairos* is described in Blake Scott's analysis of pharmaceutical companies' responses to 9/11 and the anthrax scare. President George W. Bush warned in his 2003 State of the Union address that "we must act before the dangers of [bioterrorism] are upon us," and shortly thereafter launched Project Bioshield, which allocated $5.6 billion in funds "to develop and stockpile vaccines and treatments for biothreats such as anthrax and smallpox" (qtd. in Scott 115). Scott notes that before 9/11, "the U.S. [was] the industry's chief ally in securing favorable trade agreements and in threatening countries (mostly in the developing world) that offer any resistance" but that this partnership had created a negative image of both "big pharma" and the governmental policies supporting it (122-23). The threat of terrorism and bioterrorism created by 9/11 "created a kairotic opening for the drug industry to

improve its public image" in order to gain partnerships and funding in the future (123). The drug companies were able to use a political situation of uncertainty and defensiveness to gain the advantage they would need to make profits as well as fund research and development of their products.

Scientific and technological development takes not only time, but money and other resources. The political climate can determine who gets that funding, how much is allocated, and what developments are expected as a result. Depending on recent events, the government may choose to place their resources in defensive, offensive, or simply exploratory research and development. Environmentally friendly technologies may be seen as a defensive measure against the issue of climate change, which Gore built up as a threat to national (and planetary) security. Rocket development, while perhaps seen by some as exploration and research in the name of science, was backed by the government as an offensive and defensive weapon. Drug companies gained partnerships and funding from the government in order to develop defenses against bioterrorism. The nature of the political climate at any given point in time, whether the U.S. is involved in a conflict as an aggressor or is on the defensive against a biological enemy, determines what is deemed important. The *kairos* this creates for science and technology research thus changes with each new political development, opening opportunities for different types of research at different times, influencing when and how industries and science writers decide to promote their research or topics.

Of course, while politicians in power have the most direct power over how government resources are allocated, public opinion has a significant influence on what new science ideas can be successfully integrated into society. The willingness that the public may have to accept or reject new ideas must be considered when science writers or researchers present their ideas. However, this leaves the question of how the public decides what new ideas to accept or not accept and how science writers can use this decision making process to tailor their texts with methods that will make the audience more likely to agree with their arguments.

One influence on the level of support that the public deems appropriate for new developments is the science and technology that is accepted as standard at any given point in time. While Fahnestock says that lay audiences will respond to application or wonder appeals, what can be applied to everyday life and what will be considered "wonderful" depends heavily on the current level of familiarity that the audience has with the topic already. When AIT was released, the public was already familiar with climate issues. Warnings about CFCs or a hole in the ozone or even global warming were no longer issues to marvel at or be afraid of. Gore started from the familiar idea of global warming, an issue the audience had already accepted, and moved on to the argument that global warming is caused by human activity, an argument that may have been less familiar to his audience. In addition, he chose examples and explanations to build his argument that the audience may not have had previous knowledge of and therefore that would be seen as startling new information. This allowed him to pull in the audience using a form of the

wonder appeal before using the application appeal in his suggestions for future change.

New science and technology ideas rely on similar tactics to gain public acceptance. For example, when NASA was founded during the Cold War, the idea of spaceflight was still new and thrilling. Simply the idea of spaceflight, especially of manned spaceflight, was new and innovative enough to capture the minds and imaginations of audiences across the nation. The push for space, while also a political issue, was a prospect that itself thrilled the American public into supporting space research and NASA. Space travel was still a topic largely relegated to fiction, and the prospect of simply sending humans into space seemed fantastic. By the late 1900s however, spaceflight itself was no longer front-page news unless there was a drastic development, such as the destruction of space shuttle Challenger in 1986 and space shuttle Columbia in 2003. Spaceflight itself became routine and accepted, no longer carrying the wonder appeal on its own without an additional aspect to spark interest.

While spaceflight still captures the imaginations of Americans across the nation, it has become routine, and so on its own no longer carries the influence it once did. Rather, space exploration advocates must rely on additional arguments and developments to gain the public's attention. Topics such as the possible discovery of habitable planets or scientific experiments conducted on the International Space Station can capture audiences because of the additional wonder and application appeals that they bring to a subject that has in large part lost the

ability to "wow" audiences on its own. Spaceflight itself has become such an accepted and regularized aspect of American culture that an issue at the time of this writing is not the prospect of manned spaceflight, but rather the possibility of an absence of manned spaceflight.

Like the topics of climate change and spaceflight, many scientific or technological advances lose their ability to thrill audiences as they become accepted as commonplace. Science writers must constantly respond to new standards of normality in order to convince audiences to pay attention and react. In this way, public opinion helps build *kairotic* moments that determine what scientific or technological developments will be the most successful and thus what science writing methods and topics will be effective at conveying those new developments.

Responding to *Kairos*

Although Gore was able to use the ethos he had created through years of political maneuverings and advocacy campaigns, many science writers begin without an established ethos to rely on or to adjust. In order to convince audiences to see the writing or presentation of new scientific information as legitimate, audiences must first be convinced that the presenter has authority to discuss the issue and has the audience's well-being in mind. Depending on the *kairos* that the rhetor is responding to, a rhetor may already have an audience willing to listen and thus will easily be able to build an effective ethos. However, a rhetor may also face an audience who is unaware of or even hostile towards the new development. In

this case, the ability of the rhetor to establish an authoritative yet concerned ethos becomes vital to the audience's acceptance of the new idea.

Science writers begin to establish an ethos through their publication methods. While a particular writer may not be well known, publication in a source that the public already knows and trusts can encourage the audience to accept new ideas as truthful and attention-worthy. For example, popular science writing magazines such as *Scientific American*, *ScienceNews*, or *Popular Science* appear on newsstands throughout the country regularly. The familiarity that readers feel with these names allows writers who contribute to these magazines to begin their arguments with the assurance of an audience who, while they may not already agree with the writer's argument, believe that the writer is honest and knowledgeable and that the topic is relevant. However, even this ethos may change with time. If information from a trusted publication is found to be false or if the publication publishes information that does not fit with the audience's viewpoints, then the audience's loyalty not only to the publication but to all the information it contains may be jeopardized. In addition, as new publications appear, competition may result in readers seeing some publications as more legitimate than others. Finally, certain publications may be known as having one area that they excel at, versus other publications or versus other subjects within the same publication. For example, one publication may be known for promoting deep-space research while another is known for their articles on biology. Science writers rely on the ethos of the publication to help create an ethos for themselves and must determine which

publication will provide the best opportunity for their writing to have the greatest effect at the time that the writer decides to publish. Although some science advocates may be able to gain an audience through their own previously created ethos, such as Carl Sagan with his series *Cosmos*, most science writers must rely on third-party publishers to begin to establish themselves as credible.

Although Gore started with the advantage (or disadvantage, depending on the audience) of having a pre-established ethos, once he began his argument, he had to rely on tactics similar to those used by other science writers. First, Gore used language, information, and tone that established him as an authority on his subject. Although he explained the subject in terms that a lay audience could understand, he used enough technical terms, numerical data, and charts to make himself seem knowledgeable. Science writers constantly walk a thin line between writing scientifically and writing in a way that is easily understandable. However the level of familiarity that the public has with a particular topic will determine where that line lies, and as the public grows more familiar with scientific topics, writers must move more and more towards more technical descriptions or towards explanations of additional topics that rely on subjects the audience already knows.

While writers in any field must be able to use jargon effectively enough to show that they are an authority without making the text so jargon-heavy and technical that it dissuades possible audiences, this is especially true of science writers. They must take information that by its nature is technical, dense, and jargon-laden and translate it into understandable prose without losing the

"scientific" voice. For example, in the recent *Scientific American* article "Diseases in a Dish," Stephen S. Hall constantly shifts between using language that he is sure his readers will understand, such as when he says that "if successful, the disease-in-a-dish concept could speed up researchers' understanding of many different diseases and lead to faster, more efficient screening of potential drug therapies … Researchers in Germany, for example, have created cardiac cells that beat irregularly, mimicking various heart arrhythmias" (42). In this passage, he moves between using understandable language, such as when he as saying the concept could "speed up researchers' understanding of many different diseases," and more specialized language such as the terms "cardiac cells" and "heart arrhythmias." However, while he does briefly explain what stem cells are and the differences among different kinds of stem cells, he does not spend much time describing this concept in basic terms because when the article was written, the audience was likely already familiar with this idea after years of scientific and political discussion.

He continues this tactic throughout, using language that keeps readers engaged but sprinkling it with words and phrases that the audience may not be familiar with but which are obviously technical terms from the field being discussed. The phrase "disease-in-a-dish," which he uses throughout the article, itself shows this mixture of scientific and lay understanding. On the first page of the article, Hall explains the scientific concept of "chemically induc[ing]" skin cells "to become a form of stem cell known as an induced pluripotent stem cell" that could be re-programmed to become cells that exhibit symptoms of "molecular defect" diseases,

"re-creat[ing] the disease ina petri dish" (42). While he introduces new ideas, he relies on readers' familiarity with the idea of stem cells in general to provide a base for the new, technical information. His use of the phrase "disease-in-a-dish" for the remainder of the article allows readers to feel comfortable with a term that uses familiar words and a reassuringly jingle-sounding phrase to explain a new, complex idea that Hall must convince readers to accept.

A similar tactic that science writers must rely on and that Gore employed is that although he could have been considered an expert himself, Gore often relied on information that was cited from sources that may be considered more credible, such as Navy records, the research of specific scientists, or "48 Nobel Prize-winning scientists" (Gore 268). When science writers try to convince audiences of their arguments, they too must rely not only on their own authority as experts, but on the authority of others who may seem more credible. Perhaps the most prolific authorities are the famed Scientists and Researchers and their Science—those generic identities that back up and legitimate any information that seems like it must be verified to be believed. For example, in Hall's article mentioned above, "researchers," "investigators," and "scientists" are all cited by the end of the first page of the article (42).

In addition to these generics though, science writers, especially for popular science articles, do often refer to specific researchers or scientists by name, establishing a stronger sense of legitimacy. By knowing the name (and often the career title) of a subject expert, audiences feel that they have found a true

authoritative source, one that they can put a name and face on and recognize again later as a trusted authority. Hall introduces, among others, "Wendy Chung, director of clinical genetics at Columbia University … Lee L. Rubin, a refugee from the biotech industry who became head of translational medicine at the Harvard Stem Cell Institute, and Kevin C. Eggan, a tireless young stem cell scientist from Harvard, who was collaborating with Christopher E. Henderson and other motor neuron experts at Columbia" (42-43). Introducing these characters into his writing allows Hall to rely not only on his own knowledge, but on the authority of people who the audience will accept as experts. By using a mixture of familiar and new language and citing outside expert sources, science writers build an ethos within the text that convinces readers to trust the information being conveyed and to accept the new ideas as legitimate.

This trust and acceptance, however, must be cultivated in different ways depending on the *kairos* that the rhetor is responding to. As mentioned above, the current state of science and technology as well as the politics and cultural values leading up to the text determine what an audience will accept as trustworthy or acceptable. Rhetors must be ready to respond appropriately to this situation both when establishing an ethos and when making an argument. Gore responds to a culture of skepticism by first making an argument that global warming is happening and then moving to the argument that it is caused by human activity and that we must take action as a culture to change. At the time of this writing, such arguments may not be always be necessary. Ben Austen's article "After Earth" in the March

2011 issue of *Popular Science* equates climate change with the extinction of the dinosaurs as a result of an asteroid impact, not as a theory, but as a truth so established that is hardly worth mentioning.

Hall's article is one that clearly shows the need for a rhetor to focus on the *kairos* of his or her subject before establishing an argument. His topic is one that is currently hotly debated: stem cell research. His argument focuses on convincing audiences that stem cell research is not only acceptable, but useful and moral. However, his topic carries serious connotations politically and socially. Stem cell research is seen by some as a miracle cure and by others as the unethical exploitation of unborn babies. Both sides feel strongly about their stance, largely based on moral values. Because of this, Hall works hard in the beginning of the article to establish not only his ethos and the ethos of his sources as authoritative, but also as fellow humans concerned with the wellbeing of the audience. He introduces two elderly sisters with a family history of Lou Gehrig's disease who participate in stem cell research in order to try to help find a cure that will help them, their children, and other people with the disease (42). Using these women as an example, Hall attempts to show the ethical and moral dimensions of stem cell research not only by making a logical argument, but by allowing the audience to connect personally with these suffering women. This personal connection allows the audience to see stem cell research as a moral imperative for helping victims of disease fight back and recover and gives Hall an opportunity to appeal to his audience with pathos.

Hall is careful to explain that the stem cell research discussed in this article "should not be confused with embryonic stem cells—the kind derived from early embryos" (43). He briefly discusses the moral dilemma of using embryonic stem cells, Bush's 2001 decision to restrict funding of embryonic stem cell research, and the subsequent attempt at privatizing the industry, which resulted in "scientific uncertainty and funding chaos" (43). Hall also discusses the scientific setbacks but moves into a hopeful discussion of how stem cells might be used to create diseases-in-a-dish that can help develop new drugs (43). Rather than get defensive about his topic, a move that could have hurt his ethos if his audience suspected that his imperatives did not fit with their moral values, Hall is careful to acknowledge the questionable moral issues while at the same time promoting diseases-in-a-dish as a moral and useful method of using stem cells in research. The politics and the public perception at the time of the publication was to view stem cell research as controversial and possibly immoral research. As Hall notes, stem cell research is often exclusively connected with embryonic stem cell research, and thus connected with the idea of harvesting stem cells from unborn fetuses or babies (the term may change depending on the audience's stance). The debate over the ethics involved is one that carries over from the pro-life/pro-choice debate about when life "officially" starts and whether embryos count as humans. Hall's careful acknowledgement and explanation of how his topic differs from this controversial topic allows him to possibly gain the approval of members of both sides of this argument rather than alienating one side and restricting his audience.

Current events can also help science writers determine not only what an audience will find acceptable, but what they will find interesting. Since Gore published AIT, the subject of global warming and climate change has gained more and more attention, and is now a topic that editors use to draw readers in, such as the May 2011 issue of *Scientific American*, whose cover promises "7 Radical Energy Solutions: They're risky, but they could pay off big." Current events have the same draw. In the February 2011 edition of *New Scientist*, a science news page uses the January 8, 2011 shooting of congresswoman Gabrielle Giffords to draw readers to the fact that her husband was commander for the next space shuttle flight ("Gabrielle Giffords"). The blurb goes on to say that "the mission will deliver a long-awaited cosmic ray telescope to the International Space Station" ("Happy to Fly"). The following entries on the news page discuss the genes of water fleas, new NASA probes exploring the sun, and fossilized sand. The current event blurb that introduces the page draws readers in by referring to a widely known current event so that readers might notice the more "pure" science news. However, if Giffords's shooting were used in another ten years to introduce an article about the end of the space shuttle era, the audience might not be as interested and the connection of the shooting to the scientific information might not be as clear.

Finally, as Fahnestock reminds us, writers must understand what readers might consider amazing or applicable at any given moment in order to gain audience support. The wonder appeal often comes packaged in a drama-filled focus on "human interest" (Nelkin 82). Scientists are portrayed as "industrius, persistent,

and independent; all in all, they incorporated the most positive values of American culture." (Nelkin 82). They are viewed as "above normal human preoccupations" and their achievements, including Nobel Prizes, are often catalogued and reported as faithfully as popular sports scores (Nelkin 17, 15). As Nelkin notes, science and scientists are portrayed as "remote but superior wizards, culturally isolated from the mainstream of society" (14). This treatment accords scientists the same air of mysticism that attracts readers to articles about pop stars, heiresses, royalty, or sports figures. The draw of the unattainable leads readers towards curiosity about these figures who are not part of the "normal" world and the work that they do. The wonder here comes from the fact that the scientist and science occurs outside the normal experiences of readers and thus seems to be an awe-inspiring "superior culture" that readers may glimpse and perhaps even understand, but not join (Nelkin 14).

Gore, although he often attempts to portray himself as a member of the same community as his audience, regularly portrays his sources in this way, as superior beings with inspiring insights. Science writers must employ similar tactics. While science writers themselves may not be seen as "above" their audience, the topics of their writing, the scientists, need this air of mystery to convince the public to accept them and their work. Hall's description of the scientists behind the disease-in-a-dish idea seems to show the scientists as tireless, inspired miracle workers who recognized "potentially revolutionary ideas" and were able to come to success through a seemingly harrowing process of controversy, failure, and lack of funding

(43-44). Success happened "suddenly" after years of toil (44). Although this seems to show scientists as average since it acknowledges failure, the effect is actually to paint them as extraordinarily devoted to a higher cause and thus as "above" the regularly daily life of the audience.

In addition to the draw of higher culture, science writers rely on the journalistic concept that what is unexpected or out of the ordinary will appeal to readers' sense of wonder and inspiration. This depends heavily on the current state of affairs in the field in question. Hall's article describes research that readers will recognize as unique as a result of the topic's controversial nature and the resultant political issues surrounding it. Ben Austen's article "After Earth" in *Popular Science* relies on a similar tactic: the idea that humanity may need to colonize space in the near future. A blurb above the title claims "humanity may have millennia to find a new home in the universe—or just a few years" (46). An article about space travel may not seem unique in 2011 in a culture saturated with science fiction and a world that has come to see human habitation on space stations not as awe-inspiring but as regularized and expected. However, audiences see astronauts and space explorers in the same light that they see scientists, as "above" ordinary citizens. Space travel is relegated to a select few. The hint that space travel and exploration could advance to the point that ordinary citizens could fly to and help colonize other worlds within the lifetime of the audience is unexpected and unique enough to draw readers into the article. In each case, the writers must take into account the political, social, scientific, and technological implications of their topic and write in a way that

capitalizes on the particular *kairos* available at the time to determine what audiences will consider fantastic or will dismiss as mundane.

Audiences of science writing do not only want to be entertained, however. They want to know how scientific and technological advancements will affect their lives. To this end, science writers rely on the application appeal to show that the subject of a text could in fact have consequences for the audience. Although science and scientists may be seen as above everyday life, if the results of their work can be shown to impact the public, readers will form a personal connection with the subject and will be more likely to respond to a text explaining it. Hall's article explains that the disease-in-a-dish concept can be used to find cures to common diseases that may afflict readers or their family and friends. Austen's article, while it may seem more like fantasy and less like reality to many readers, focuses on how to keep the human race alive in the case of a catastrophe. In the face of decades of disaster movies, rumors of the end of the world occurring in 2000, 2011, and 2012, and constant attention in popular media to issues such as the future disasters of global warming, overpopulation, and dwindling resources, solutions to surviving a planetary holocaust could seem practical to readers, and quotes from authorities such as "Princeton University Physicist Gerard O'Neill" and "Al Globus, a contractor at NASA's Ames Research Center" make the possibilities of humans living off of Earth seem more realistic (Austen 50). In addition, a section explaining how this could happen shows readers that Austen is not simply espousing a theoretical possibility, but a real one. He encourages readers not to see off-planet living as

something that will happen to faceless future populations, but as a possibility for the readers themselves. Applying any science or technology writing to the lives of the audience encourages the audience to support the subject by showing audience members that they personally will benefit from the research.

Like Gore, science writers in any field must understand the current *kairotic* situation in order to be able to respond appropriately and gain an attentive and supportive audience. Establishing an ethos that not only establishes authority but also develops audience interests is vital. Writers must respond to the *kairos* at a particular moment in order to draw in readers and retain them. This means establishing authority while at the same time conveying goodwill towards readers' best interests and catching readers' attention through current events or through new developments that Fahnestock would call wonderful or applicable. How writers decide to respond to this challenge determines not only how the audience feels about the actual writer, but about the scientific topic that the writer discusses.

Creating Kairos: The Impact of Popular Science Writing

Twenty-first century Americans have high expectations when it comes to science and technology. People in their twenties and thirties regularly joke about their disappointment that flying cars are not yet standard vehicles in 2011. Spaceflight has become an accepted, normal aspect of life, so much so that a hot topic in current events at the time of this writing is not the possibility of going to space, but rather the possibility of *not* going to space. We expect medicine to cure nearly every disease and to be able to find cures to currently incurable ones. These

expectations have been built up over a lifetime of constant access to scientific ideas, or at least the popular culture versions of scientific ideas. While these expectations help determine what science writers deem appropriate for a particular audience and how the topic is presented, they also help determine what new developments take place once the audience has been made aware of current science and technology.

As Nelkin notes, the view that science writers take of a topic highly influences how the public sees that topic. Science writers determine what information is important for the public to know and understand as well as what the public opinion of that information should be. By selecting some topics as stories and headliners, others as blurbs on a back page, and others as not newsworthy, science writers act as gatekeepers to public knowledge about science. Even the words writers choose to relay the information carries connotations that the public is quick to pick up. Nelkin compares descriptions of Chernobyl as a "disaster" versus an "event," of embryo research as "'enhanc[ed]' fertility" or "'manipulat[ing]' persons", of Prozac as "therapeutic medication" or a "mind-altering drug" (11). In each case, the phrases carry strong positive or negative connotations, and lay readers pick up on those cues and base their own views on the views of a trusted authority: the writer.

As these issues become part of the public consciousness, they also become part of public policy. Issues that may capture the attention of lay readers, such as stem cell research, space exploration, or energy efficiency, also become popular topics of political debate. These debates center not only on the objective, scientific

theories and ideas behind the topics, but also on the morals, emotions, applications, and economic value that the public has placed on them. When a topic becomes mainstream in popular culture, it also becomes a political issue, and policy and policy makers adjust according to the common beliefs of the voting public.

In the case of AIT, Gore and others used the public reaction to AIT to try to influence politics in favor of climate-friendly policies. The more enamored the public is with an idea, the more likely it is that elected officials will address the issue, even if they do not actually act on the statements. For instance, climate change has become more of a political issue than before 2006, to the point that it was one issue that both Obama and McCain seemed to somewhat agree on during their 2008 election race in the sense that they both considered global warming and climate change an imperative (Irvine; Haas). While there were a variety of public opinions about other issues, such as healthcare and taxes, climate change had become an accepted issue not only in the scientific community (which is consistently referenced when the validity of climate change is in question), but in the lay and political communities as well. Because of this widespread acceptance, the candidates were left not to debate the issue of climate change itself or if they would focus on it during presidency, but rather how much they would focus on it.

As popular culture influences politics, it influences science itself. Although most members of the public are likely unaware of the extensive scientific research occurring daily in laboratories, universities, and industries throughout the country, when they do become aware of an issue, the reaction to that awareness can

influence how current research is conducted and what further research is or is not funded. With the power to influence political policy comes the power to help determine where funding is dispersed. Although individual members of the public cannot be aware of all the research that is funded through the government, when scientific issues are brought to public attention, the reaction of the majority steers the direction of future research.

The popular culture idea of what is acceptable or not at any given point influences the public to react by supporting or not supporting scientific and technological ideas and developments. This support manifests itself through the influence of public opinion on the industries in question, either through the direct influence of participation in the new development or through the more indirect influence of voting. For example, supporters of environmental protection or space exploration form advocacy groups such as the Audubon Society or the Coalition for Space Exploration. Through these groups, members may encourage one another to participate in the process of development by writing letters to senators, donating money, or simply by building a positive public image of the issue by discussing it with people who may not yet be supporters. For other industries, individuals may support or not support a development by becoming a consumer of a new product, by building loyalty to a particular brand or company, or by refusing to support a new development. The drug companies discussed in Blake Scott's article sell not only to the government, but to private individuals, who directly help fund the companies through their purchases. Finally, individuals may impact the

development process by voting for politicians or policies that support their own beliefs and values. With such a significant impact on scientific and technological developments, public opinion also has a significant influence on the *kairos* that an industry may take advantage of.

When the public approves of a scientific issue or topic, that industry gains both esteem and funding, allowing it to continue research and move forward in the field. Cancer research is one field that has enjoyed significant positive focus from the press and from private foundations and individuals. The American Cancer Society sponsors Relay for Life each year, a well-publicized fundraising and public awareness event that began with a colorectal surgeon from Tacoma, Washington's idea to circle a track for 24 hours as a fundraising gimmick. The event has grown since then to encompass 3.5 million participants, 5,000 communities, and 20 countries ("What is Relay for Life?"). In recent years, breast cancer has taken a prominent role. Pink ribbons supporting breast cancer awareness and research can be found on anything from car magnets to battery packages to sports equipment. During Breast Cancer Awareness month in October 2010, the NFL sponsored the campaign "A Crucial Catch" that urged women to get mammograms. As part of the campaign, the league painted pink ribbons on their football fields and players wore pink cleats ("Pink").

Public perception of this field is reflected in the funding the National Cancer Institute receives each year from the government and how that money is allocated. Between 2007 and 2009, funding for breast cancer rose from $572.4 million to

$599.5 million ("Fact Sheet"). While funding for some other forms of cancer also rose, breast cancer research received significantly more funding that even the next highest funded category, prostate cancer, which received $293.9 million in 2009, a decrease from its 2007 allocation of $296.1 million ("Fact Sheet"). Another form of cancer that garners great public awareness as a result of anti-smoking campaigns, lung cancer, saw an increase from $226.9 million in 2007 to $246.9 million in 2009. Less publicized cancers, however, did not seem to receive nearly as much funding, regardless of the risk they may still pose: in 2009, pancreatic cancer research received $89.7 million, kidney cancer research received $45.2 million, and bladder cancer research received $25.9 million ("Fact Sheet"). While other factors certainly could have been at play in deciding allocations, it seems clear that publicity and public awareness greatly benefits the industries that receive such attention.

However, when the public opinion turns against an industry or research focus, the progress in that field tends to be slowed or stopped. Stem cell research for example, as Hall notes, is a politically volatile subject. What halted stem cell research in the past was in large part not the researchers' lack of interest or snags in the research process, but rather "a loud public debate over the ethics of stem cell science" which "politicized the science and slowed research" through limiting funding (Hall 43). Although the scientists involved tried to move towards more privatized funding to continue their research, losing government backing was a major blow that was not easily overcome.

In addition to political reactions to public opinion, when an issue becomes ingrained as negative in the public consciousness, even private companies may be unwilling to engage in practices that could be seen as questionable at the risk of losing the loyalty of their supporters. The effect that public opinion can have on private companies is clearly demonstrated in Blake Scott's article. He notes that when members of Congress thought that the drug company Bayer was taking advantage of a political and human safety crisis in order to make a profit with sales of their drug Cipro to the U.S. government, the company capitulated and both lowered the price of their medicines as well as running a series of press releases that portrayed Bayer as "patriotic" and "dedicat[ed] to protecting the American people" (131). In addition, they ran ads showing images of human faces instead of a corporate logo, letting the public know that "the people of Bayer are with you" (131). Bayer understood that in order to retain loyalty to their brand and thus the funding and sales profits they needed for research and production, they would have to convince the voting and paying public that they were a company with good intentions and admirable morals.

Just as Gore created a space for future rhetors to discuss climate change and prompt action, so too does each science writer who decides what topics to report and how to portray them to the lay public. By filtering the information that is disseminated and suggesting how the public should react to the information, science writer help to determine what public opinions will form. This in turn affects the politics surrounding the issues as well as the research and development of science

and technology through funding and through the industry's reaction to negative or positive public perceptions of their field. *Kairos* is not simply a single moment that rhetors respond to in order to be successful. It is also the opportunities that they create for rhetors who come after them and for the industries who images they help to create, in a perpetual cycle of influence and response.

Science Writing as Invention-in-the-Middle

Just as Gore adjusts and adjusts to his audience, science writers and their audiences adjust to each other both during and after a text's presentation. Audiences enter what they consider to be a one-sided conversation in which they are the students and the science writer is the teacher, disseminating information from external authorities. However, this is not always the case. As seen above, science writers must constantly consider their audience and the *kairotic* moment available to them and adjust their writing accordingly. Hall moves from storyteller when he describes the sisters in the beginning, to teacher when he explains the scientific process behind creating diseases-in-a-dish, to moral guide when he describes why this particular research is not controversial like audiences generally assume stem cell research to be. As Hall makes this progression, his audience also progresses, from an audience expecting to be entertained to active learners and then to moral judges. Science writers must constantly adjust to keep their audience not only informed, but focused and accepting, and these adjustments prompt the turning between *kairotic* moments that creates new, shifting identities for both rhetor and audience as each responds to the expectations of the other. Like Gore,

science writers must be able to predict their audiences' reactions and react accordingly in order to take full advantage not only of the *kairotic* moment that they began writing in, but each new moment that presents itself during the course of the text.

Implications

The effect that *kairos* has on the dissemination of science information to the public has far-reaching consequences. The complex rhetorical situation that any science writing text must work with determines outcomes ranging from what becomes accepted as standard within a culture to what scientific fields are given the opportunity for advancement. Science writing impacts not only the audience of a particular text, but, through the audience, affects the *kairos* of future advancements, viewpoints, and texts.

As a result, any analysis of *kairos* and science writing is not analysis of an isolated text, but rather analysis of a text that is complexly intertwined not only with other texts, but with the material world that it represents and changes. As science writers help determine public perception of science and technological progress, they must always be aware of their influence on the future of the subjects they report. The public view of scientific subjects influences politics, funding, and society's acceptance of new ideas and breakthroughs, and these in turn influence what new research begins, what old research continues, and what research is stopped in favor of more palatable or profitable avenues. With power to influence the progress of science and technology itself, science writers and science writing

deserve more attention than they seems to currently enjoy. Perhaps, however, this lack of critical attention from members of their audiences serves to give them more power to influence.

CHAPTER 6: PEDAGOGICAL APPLICATIONS

In college composition classrooms, we try to teach transferable rhetorical skills, even if we do so without directly addressing terms such as ethos, pathos, and logos. We encourage students to define an audience for their texts and keep that audience in mind as they write, with the assumption that they will be able to analyze audiences in other writing situations. However, this can be limiting. In class, when students do recognize an audience other than the teacher, they often make this recognition in basic terms (e.g. adult, intellectual, middle class, average) without fully understanding how to respond to that audience. They may make some rhetorical adjustments while writing, such as choosing certain words depending on intellectual level or deciding how much description to include depending on the audience's familiarity with the topic, but they likely will not completely recognize the temporal, physical, and psychological space that the audience occupies.

Some students are encouraged to consider the exigence of their writing, or the "thing waiting to be done" as Bitzner says, but in these cases they often recognize a limited version the situation. They may say that they decided to write a letter to a company because they found bugs in a food package or decided to write an editorial piece about campus parking as a result of their own experience circling full parking garages. However, the version of exigence that students seem to consider is, again, limiting in that it does not take into account the full situation surrounding the issues being discussed.

Benefits of teaching *kairos*

Kairos, when taught simply as "the right time," may be just as limiting as any other single-purpose rhetorical strategy. However, when taught as the idea of "opportunity," incorporating analysis of all the myriad aspects that must go into the consideration of any text, kairos becomes nearly all encompassing. Students must learn to analyze the opportunity for a text from any possible angle, including chronological time, physical location, political situation, audience moods and knowledge, counterarguments, allies, publication method, the writer's ethos, and a host of other considerations. When analyzing professional writing, students may consider elements such as the history at the time of writing, the writer's reputation or credentials, and other texts that the text under analysis responds to either directly or indirectly. After identifying these elements, students may analyze the rhetorical strategies used by the writer and identify what techniques were used to respond to each aspect of the *kairotic* opportunity, helping students to understand that writing is not something that happens in a vacuum, but rather is completely intertextual and dependent on the specific situation in which the writing occurs.

When taught in this manner, *kairos* can teach students to analyze their writing in more depth and from more angles. By applying conclusions from analysis of others' responses to *kairos* to their own process, students may understand how writing skills may be used in a variety of situations and how to adjust the writing process to those situations. This understanding can prompt more insightful invention, creation, revision, and delivery as students consider their own work as

intertextual and connected to a web of actions and reactions rather than as isolated writing instances.

Benefits of analyzing science writing

While any text is intertextual and may be analyzed in terms of *kairos*, analyzing science writing may be particularly beneficial to undergraduate students because of its exceptionally interconnected nature and its relevance to modern life. As discussed in previous chapters, science and technology have become central in American society. Scientific progress is equated with economic and social power, both within the country and internationally. Because scientific success is connected to these other power structures, the *kairos* for any science writing can become incredibly complex, including politics, economics, social structures, religion, and personal beliefs as well as other science-based texts both within the same field and in other scientific fields. This lends a depth to the study of the *kairos* of science writing that can allow students to analyze rhetorical situations more fully than they would be able to with texts that are more situation-specific and isolated.

In addition, science is a topic that American students are familiar with. American children are often judged based on comparisons of their math and science scores with those of children from other countries, so students come up through the school system hearing that these subjects are vital. Also, most modern students have grown up with technology as a familiar constant in their lives. They have always had personal computers, cell phones, and the Internet available to them and are personally invested in utilizing these forms of communication. They have grown up

in an age of scientific progress, where manned space flight is a regular occurrence, "heredity" and "DNA" are ideas known since childhood, and new scientific achievements are announced on the main pages of *Yahoo! News* and *MSNBC.com* rather than relegated to specialty magazines or the science insert of a newspaper. Because of this, today's college students are used to encounters with science topics in their daily lives and thus may have some personal connection with scientific and technological advancement, which can help them to see the study of science writing as relevant to their lives and thus as a topic worth serious study.

Where this will help

This sort of approach may be particularly useful in Writing Across the Curriculum (WAC) and Writing in the Disciplines (WID) courses. Because the study of *kairos* incorporates aspects of every element of a rhetorical situation, it can help students learn to recognize subtle differences between the writing opportunities available within different disciplines. This understanding can help students to identify best practices for writing depending on the field and can help them see how to transfer writing techniques between situations. Also, by analyzing science writing, students may see that rhetorical strategies are not relegated to an English classroom, but can be applied successfully in fields that do not seem obviously connected to the discipline of writing. Finally, focusing on science writing allows for the analysis of texts related to nearly any discipline within the university as a result of the interconnected nature of science writing texts.

Kairos of science writing may also be useful in Writing About Writing (WAW) courses, as students analyze how responding to different opportunities influences the process of invention and creation. By analyzing both their own writing and the writing of professionals, students may gain a more thorough understanding of how the process of writing occurs. In addition, analyzing how a text influences the texts that come after it can help students to see how the writing process creates influences as well as responding to it. This can help them to see their own writing as connected to other texts, both that came before and that will come after.

Incorporation

The study of *kairos* in science writing may be used either as a central theme to an entire composition course, or it may be used as a single unit within the context of a course. As a central theme, it may be used to show how multiple rhetorical strategies, including creation and implementation of ethos, pathos, logos, and exigence, come together to take advantage of a unique opportunity. Students may analyze each rhetorical strategy in terms of *kairos* throughout the semester, utilizing different science writing texts for analysis of each. As students write their own papers, they may analyze each aspect of the *kairos* that they are responding to, the techniques that they are using to create their response, how they think their audience may adjust the *kairos* during presentation, and what new *kairotic* moments their texts may help to create. Through this sort of in-depth analysis of others' writing and of their own writing, students may gain a better understanding of the writing process and how that process may be altered depending on the

situation that the students may find themselves in both in their academic studies and in their future careers.

This type of study may also be used as a single unit within a composition course. After studying other rhetorical elements, students may analyze the *kairos* of one or two science writing texts in depth, discussing techniques the writers used to respond to their specific *kairotic* opportunity. Students may then use this concept to analyze the *kairos* of their own assignment before writing and afterwards may reflect on what rhetorical strategies they used to respond to each element of the *kairotic* situation.

Conclusion

Analysis of the *kairos* of science writing can help students to gain a thorough understanding of rhetorical situation and how to respond to it while at the same time show them how writing strategies may be applied outside the confines of a composition classroom. By studying how writers respond to *kairos* by adjusting writing strategies and employing different rhetorical strategies, students may be better equipped to transfer writing skills out of the composition classroom and into other disciplines and situations, helping them to improve their writing and communication skills in their careers as well as in their classes.

CHAPTER 7: CONCLUSIONS

Today in the twenty-first century, technology has made it possible for vast amounts of information to pass instantaneously to audiences of millions through written, audio, and visual texts. This has made science-based information more readily available to the American public than ever before. American readers are confronted daily with news stories relating science and technology headlines alongside political, popular culture, and local news stories. However, science writing is not merely the province of entertainment. In a society where science has gained elite status and where the scientist and the researcher are seen as the ultimate authorities, science writing texts command social, political, and economic power when they respond effectively to the *kairos* presented to them.

Because of this power, it is important to understand how successful science writers take advantage of *kairotic* moments and appeal to their audiences. Al Gore has shown himself to be adept at responding to any *kairos* offered to him both as a politician and as a science writer relating information about global warming and climate change. In his book and video versions of *An Inconvenient Truth,* Gore took full advantage of the *kairos* that had been created both by himself and by external events in order to create engaging texts that drew audiences into solidarity with his cause. He appeals to his audiences through the traditional rhetorical appeals of ethos, pathos, and logos, changing his tactics and focusing on different methods as each moment of the text influences the audience to react, creating new *kairotic* moments that required ever-changing responses. Through this constant shifting, he

connects with the audience through different identities, depending on what might be most effective at any given point in time, and allows his audience to see him not only as a teacher or lecturer, but at different moments as a parent, a student, a comrade, and a fellow human being with the idealistic notion that one person really can change the world.

Although AIT created controversy and is still the center of debate, there can be no doubt that it impacted how American society views the environment. Since AIT's publication in 2006, there has been a surge in environmentally-friendly practices such as sustainable power production, recycling and conservation programs, carbon offset sales, and local or organic farming. Individuals, businesses, and government entities have all joined the environmental movement, and Gore's idea that climate change is caused by human activity becomes closer and closer to being universally accepted as fact rather than theory. Although the environmental movement existed long before AIT, Gore seemed to open a space for continued environmental discussion that had not previously enjoyed such widespread support.

Like AIT, other science texts also have the opportunity when they respond to their own *kairotic* moments to influence social, political, and business practices by influencing audiences and creating new moments for other texts to respond to. This process is complex and much additional research could be done. While attention has been paid in the past to the rhetoric of scientific writing, the rhetoric of science writing for the public still presents opportunities for research. The difference in

rhetorical strategies between different levels of science writing could be explored further. These levels may vary from writing in specialty science-based magazines read by audiences who consider themselves intellectuals to news stories on popular news websites read by amateurs to children's books written about scientific topics. Each level of science writing presents a different *kairos*, each with its own set of political and social ramifications. Additionally, more research could be conducted concerning links between science writing methods and the level of understanding readers gain about the topics presented. As more and more people are exposed to scientific ideas, do they gain deeper knowledge of science and the natural world, or do they simply learn repeatable facts that they repeat without understanding the underlying concepts, and how does this influence what readers will find understandable and interesting in the future? Also, links between popular culture and what science writing topics are chosen and how they are presented could be explored to determine how science writers take advantage of this aspect of the *kairotic* moment.

This type of analysis is relevant to multiple fields in addition to rhetorical studies. Because of their complexly interconnected nature, popular science writing texts offer a lens into many other fields, and analysis of these texts may also shed light on the developments of these linked subjects. Analysis of the *kairos* of science writing may lead us to a deeper understanding of their connection to public opinion and political policies. It may allow us to see international policy from the vantage point of international diplomatic cooperation, as we see with the International

Space Station, in addition to the view of international competition for scientific and technological supremacy. It could help us understand a growing science-focused component of popular culture that drives consumer consumption of new scientific and technological developments. Because science is ever-present in our society and *kairos* is such an encompassing concept, this type of lens may be applied to nearly any field of study in order to advance research.

In addition to research opportunities, the concept of *kairos* in science writing can offer a method of in-depth study of rhetorical strategy in college composition classrooms. This focus can provide students with an all-encompassing view of the writing process from influences on invention the influences a finished text will have on future texts. It can help students understand how rhetorical strategies can be adjusted to fit different opportunities depending on previous texts, political ideology, physical location, and audience reaction in addition to the standard cannon of ethos, pathos, logos, exigence, and audience identity, and thus may help students transfer skills to new situations more easily. It will allow students to study a topic that they are already interested in and familiar with in order to gain a deeper understanding of their own writing process. Finally, it can help students to start analyzing the world around them and the information that they are confronted with very day so that they may make more informed decisions about what their own reactions will be rather than relying on the writer to decide their reactions for them.

Science permeates modern American society, from development of consumer products and political maneuverings to education and entertainment. Because it is

so interconnected with nearly every aspect of modern life, it is important to understand how science is portrayed to the public. Science writers, in making decisions about their writing process, also make decisions about how the public will be influenced to see scientific and technological progress, including both what information they will be exposed to as well as whether they will accept or reject new ideas and developments. Studying the *kairos* of science writing can help us to understand how rhetorical decision are made in this process and can help us to see how such decisions will be made in future texts. Science writing, in explaining and promoting scientific progress, moves that progress forward, and the more we understand the how it responds to, creates, and interacts with each new opportunity, the more we may be able to use it to encourage further progress with minimal cost to material, human, or environmental resources.

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