

THE WORLD WE LIVE IN & THE WORLD WE WANT TO LIVE IN

VISIONS

MAGAZINE

Volume 1, 2nd Edition | Spring 2008

Bui Dam

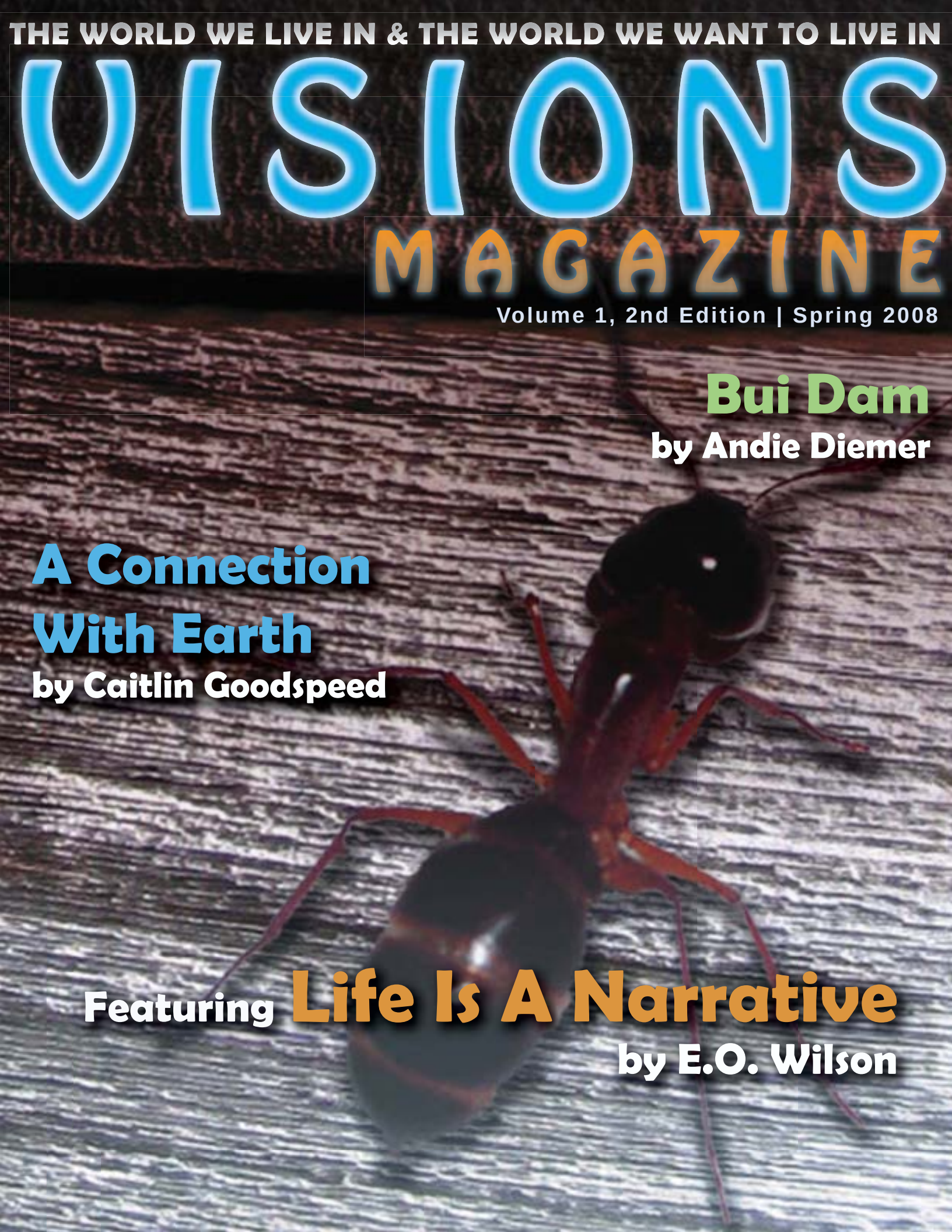
by Andie Diemer

**A Connection
With Earth**

by Caitlin Goodspeed

Featuring **Life Is A Narrative**

by E.O. Wilson



VISIONS

MAGAZINE



The World We Live In And The World We Want To Live In

Visions Magazine is about two worlds—the one we call home and the world we see as ideal. This magazine is a non-partisan, peer-reviewed publication that contains articles from disciplines commonly associated with a major in environmental studies. These disciplines include but are not limited to political science, economics, philosophy, religion, art, and English literature, including poetry, fiction and nonfiction. *Visions Magazine* is a faculty-student organized and operated publication which features the works of Elon University students and Elon University student-faculty collaborations. The primary goal of *Visions Magazine* is to engage students in the scholarly process of research, writing, and peer review. An additional vital component is the provision of publishing opportunities for students with interests in the environment and sustainable development.

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Contributing to *Visions Magazine*:

Visions Magazine seeks compelling, interesting, well-written, creative contributions on environmentally related topics. Major contributions to the magazine should be grounded in scholarly literature and/or reflect the conventions of research and writing associated with a specific academic field of study. All submissions must receive positive blind peer reviews before consideration for publication. We discourage submissions that are political or purely editorial in nature. For the next issue of *Visions Magazine*, we are especially interested in acquiring fiction, poetry, and photography submissions.

Submissions for the spring 2009 volume of *Visions Magazine* are due **December 12, 2008**. Please e-mail visionsmagazine@elon.edu for more information about the criteria for submissions and information about the magazine.



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An Interview with E. O. Wilson

by Michael Strickland and Molly Pearson

Introduction

E.O. Wilson is one of the foremost scientists of his generation and has been on the faculty of Harvard for over forty years. Author of over twenty books, he is a brilliant writer, and has received the Pulitzer Prize twice, once in 1979 for *On Human Nature* and again in 1991 for *The Ants* (with Bert Hölldobler). Wilson is usually considered the father of the fields of both sociobiology and biodiversity, and fellow scientist and Pulitzer Prize winner Jared Diamond has called Wilson one of the greatest thinkers of the twentieth century. His research and writing on the importance of biodiversity have made him a central figure in conservation biology and a world-class spokesperson for the environment.

I first interviewed Wilson about his writing in the early 1990s and was later appalled to find many colleagues at a national conference jeering him during a speech. Near the end of his talk, several even attempted to rush the stage. Afterwards, when I tried to apologize for the behavior of my fellow humanists, he laughed it off with his gentlemanly southern drawl and assured me he had been treated much worse by fellow scientists over the years. While his work was often controversial in the first half of his career, much of this work has now become mainstream, and he is often considered an heir to the mantle of Darwin. His importance to global environmentalism cannot be overlooked.

Q&A

Q: What role do young people (especially college students) play in addressing the current over-exploitation of natural resources? What can youth who are relatively powerless in traditional social terms do to help move our culture towards more sustainable ways of living?

A: In fact, the power is in their hands, or soon will be. A fundamental shift, at a tipping point, has begun in this country. It will require us to commit to the goal of a changeover to non-carbon energy sources, water conservation on a massive scale, and restoration of forests. Young people can immediately be involved and should soon lead in all of these initiatives. The time is now, and this could not be more essential for young people.

Q: The grand narrative of America, as many young people are introduced to it, revolves around materialism. What shift must today's grand narrative take to achieve a lifestyle that is more sustainable and more welcoming for a green tomorrow?

A: I will keep this short: Try steady increases in quality of life based not on growing material consumption but on a clean, stable, healthful environment for all Americans. I won't get into it here, but the disparity of incomes in this country has simply gotten out of hand. Any progress must involve some evening out of this problem.

Q: The US has a solid tradition of writers who write powerfully about the environment, from Muir and Thoreau to Abbey to Leopold and Rachel Carson—and there are many today, including yourself. But, do books have the power they once did to effect change? Who is writing today who has that impact? Who are the environmental writers you would urge young people to read today?

A: Yes, books still do matter, but, happily, they are competing with other modes of communication. I won't elaborate now, but this is to be expected. One especially promising book due out soon (I think before the beginning



of summer conventions) is Tom Friedman's new book, and I believe the title will be *Green is the New Red, White and Blue*. I urge everyone, and not just students, to read this book. [Strickland's Note: Friedman's book is based on his 2006 NY Times essay, "Green: The New Red White and Blue," and a Discovery Channel documentary by the same name. The book will appear in August 2008 and will be titled: *Hot, Flat, and Crowded: Why We Need a Green Revolution--and How It Can Renew America*.]

Q: What is the role of education in effecting change? Aldo Leopold posed the question in *A Sand County Almanac*, "Is education possibly the process of trading awareness for things of lesser worth?" Leopold was certainly no slouch of an educator (or writer). Does this concern still ring true today, or are we doing a better job with what he called "conservation education" than in the 1930s and 40s when he wrote this?

A: Education is a vital component. I believe conservation education has improved greatly since then [Leopold's time] and continues to improve significantly, although still far too slowly. And the situation today is more complex, as well. But, yes, we are doing better.

Q: Noted ecologists Eugene Odum and Frank Golley once told me that in the future popular culture media such as fiction, music, TV, and film would be as important as science in saving the environment. Is this turning out to be true? What are the downsides to that sort of influence?

A: This is true, to a degree, of course. And it's not a bad thing; it can be a very good thing, a powerful thing, but obviously the downside is the possibility that bad science and ideology can be too easily mixed in.

Q: Years ago I interviewed you and your colleague Stephen Jay Gould about your own practice of writing and the role of the scientist as writer. Both of you discussed how hard it is for a scientist to

take on the mantle of popular writing and how each of you had taken some heat in your careers for doing this sort of writing. While such resistance lightened as your scientific reputations established, isn't this bias unfortunate for the newer generations of scientists who may have this communicative talent? And what effect does this have on our culture when already fewer people read fewer books?

A: Gould received heat for that sort of thing; I never did. If your science contributions have been substantial, that kind of criticism can be avoided. The kind of heat I received was of a different sort, more ideological. But, yes, it's a problem.

Q: We are reprinting your piece, "Life is a Narrative," which appeared as the introduction to the 2001 edition of the series of collected essays, *The Best Science and Nature Writing*. This wonderful essay has never appeared anywhere else. What do you hope our very different audience will get from reading it?

A: First, I wish to thank you and Elon for reprinting this piece. I always meant it for the broadest possible audience. I am pleased it is getting more exposure here. Of course, people will take different things from it, but I intend it for a wide audience.

Q: (from Strickland) My favorite passage of your essay is this: "The narrative genius of homo sapiens is an accommodation to the inherent inability of the three pounds of our sensory system and brain to process more than a minute fraction of the information the environment pours into them.... The stories we tell ourselves are our survival manuals." Your view of narrative here is that science is narrative, art is narrative, politics is narrative, and that staying well practiced in all things narrative is a tool for living. Yet, while this

view seems natural and logical to me, I don't think it would ring true for most of our culture, and many scientists I know would resist this notion. While I get excited talking about this, why do you think many would object?

A: As you point out, those who object probably don't understand that science and art start with the same creative processes. Creativity is applied to a situation or problem. Science then filters the materials to yield what is replicable and can be reasonably supposed to be factually true. This means that a little of the poetry and beauty of the creative scientific process has to be omitted. Art does something different but starts from the same impulse. Many scientists and artists misunderstand this, but some on both sides know it to be true.

Q: So, it would be good if more readings like this essay, especially when done in educational settings, could help spread this concept that science and art are simply both primary human activities, more alike than not? And that we should focus on teaching them as such? Similar creative processes. And perhaps then we can apply all manner of creative problem solving to environmental issues.

A: Exactly, exactly.

Molly Pearson is a senior environmental studies and political science double major graduating in Spring 2008. In her free time she tutors Spanish-speaking high school students in civics, US history and science. Molly is an avid SCUBA diver with a strong passion for sharks of all sizes and plans to pursue graduate work in marine management and shark conservation.

Michael Strickland is the director of Writing Across the Curriculum at Elon and teaches professional writing and rhetoric in the English department as well as environmental studies courses. He came to Elon in 1999. He has a primary research interest in science writing and first interviewed E.O. Wilson in the early 1990s. This interview is an edited version of an interview that took place over e-mail and phone in spring 2008 specifically for this magazine.

Life Is a Narrative

by E. O. Wilson

Let me tell you a story. It is about two ants. In the early 1960s, when I was a young professor of zoology at Harvard University, one of the vexing mysteries of evolution was the origin of ants. That was far from a trivial problem in science. Ants are the most abundant of insects, the most effective predators of other insects, and the busiest scavengers of small dead animals. They transport the seeds of thousands of plant species, and they turn and enrich more soil than earthworms. In totality (they number roughly in the million billions and weigh about as much as all of humanity), they are among the key players of Earth's terrestrial environment. Of equal general interest, they have attained their dominion by means of the most advanced social organization known among animals.

I had chosen these insects for the focus of my research. It was the culmination of a fascination that dated back to childhood. Now, I spent a lot of time thinking about how they came to be. At first the problem seemed insoluble, because

the oldest known ants, found in fossil deposits up to 57 million years old, were already advanced anatomically. In fact, they were quite similar to the modern forms all about us. And just as today, these ancient ants were among the most diverse and abundant of insects. It was as though an opaque curtain had been lowered to block our view of everything that occurred before. All we had to work with was the tail end of evolution.

Somewhere in the world the Ur-ants awaited discovery. I had many conversations with William L. Brown, a friend and fellow myrmecologist, about where the missing links might turn up and what traits they possess that could reveal their ancestry among the nonsocial wasps. We guessed that they first appeared in the late Mesozoic era, 65 million or more years ago, far back enough to have stung and otherwise annoyed the last of the dinosaurs. We were not willing to accept the alternative hypothesis favored by some biblical creationists, that ants did not evolve

at all but appeared on Earth full-blown.

Because well-preserved fossils had already been collected by the tens of thousands from all around the northern hemisphere over a period of two centuries without any trace of the Ur-species, I was afraid I would never see one in my lifetime. Then, as so often happens in science, a chance event changed everything. One Sunday morning in 1967, a middle-aged couple, Mr. and Mrs. Edmund Frey, were strolling along the base of the seaside bluffs at Cliffwood Beach, New Jersey, collecting bits of fossilized wood and amber from a thin layer of clay freshly exposed by a storm the day before. They were especially interested in the amber, which are jewel-like fragments of fossil tree sap. In one lump they rescued, clear as yellow glass, were two beautifully preserved ants. At first, that might have seemed nothing unusual: museums, including the one at Harvard, are awash in amber ants. What made these specimens important, however, was their age:

about 90 million years, from the middle of the Cretaceous period, Mesozoic era, in the Age of Dinosaurs.

The Freys were willing to share their find, and soon the two specimens found their way to me for examination. There they came close to disaster. As I nervously fumbled the amber piece out of its mailing box I dropped it to the floor, where it broke into two halves. Luck stayed with me, however. The break was as clean as though made by a jeweler, and each piece contained an undamaged specimen. Within minutes I determined that the ants were the long-sought Holy Grail of ant paleontology, or at least very close to it. Brown and I later formally placed them in a new genus, *Sphecomyrma freyi* (literally, "Frey's wasp ant"). They were more primitive than all other known ants, living and fossil. Moreover, in a dramatic confirmation of evolution as a predictive theory, they possessed most of the intermediate traits that according to our earlier deductions should connect modern ants to the nonsocial wasps.

As a result of the discovery, other entomologists intensified their search, and many more ant fossils of Mesozoic age were soon found. Originating from deposits in New Jersey, Canada, Siberia, and Brazil, they compose a mix of primitive and more advanced species. Bit by bit, they have illuminated the history of ants from near the point of origin over 100 million years ago to the start of the great radiative spread that created the modern fauna.

Science consists of millions of stories like the finding of New Jersey's dawn ants. These accounts, some electrifying, most pedestrian, become science when they can be tested and woven into cause-and-effect explanations to become part of humanity's material worldview. Science, like the rest of culture, is based on the manufacture of narrative. That is entirely natural, and in a profound sense it is a Darwinian necessity. We all live by narrative, every day and every

minute of our lives. Narrative is the human way of working through a chaotic and unforgiving world bent on reducing our bodies to malodorous catabolic molecules. It delays the surrender of our personal atoms and compounds back to the environment for the assembly of more humans, and ants.

By narrative we take the best stock we can of the world and our predicament in it. What we see and recreate is seldom the blinding literal truth. Instead, we perceive and respond to our surroundings in narrow ways that most benefit our organismic selves. The narrative genius of *Homo sapiens* is an accommodation to the inherent inability of the three pounds of our sensory system and brain to process more than a minute fraction of the information the environment pours into them. In order to keep the organism alive, that fraction must be intensely and accurately selective. The stories we tell ourselves and others are our survival manuals.

With new tools and models, neuroscientists are drawing close to an understanding of the conscious mind as narrative generator. They view it as an adaptive flood of scenarios created continuously by the working brain. Whether set in the past, present, or future, whether fictive or reality based, the free-running constructions are our only simulacrum of the world outside the brain. They are everything we will ever possess as individuals. And, minute by minute, they determine whether we live or die.

The present in particular is constructed from sensations very

far in excess of what can be put into the simulacrum. Working at a frantic pace, the brain summons memories—past scenarios—to help screen and organize the incoming chaos. It simultaneously creates imaginary scenarios to create fields of competing options, the process we call decision-making. Only a tiny fraction of the narrative fragments—the focus—is selected for higher-order processing in the prefrontal cortex. That segment constitutes the theater of running symbolic imagery we call the conscious mind.

During the story-building process, the past is reworked and returned to memory storage. Through repeated cycles of recall and supplementation the brain holds on to shrinking segments of the former conscious states. Across generations the most important among these fragments are communicated widely and converted into history, literature, and oral tradition. If altered enough, they become legend and myth. The rest disappears. The story I have just told you about Mesozoic ants is all true as best I can reconstruct it from my memory and notes. But it is only a little bit of the whole truth, most of which is beyond my retrieval no matter how hard I might try.

This brings me to the relation between science and literature. Science is not a subculture separate from that of literature. Its knowledge is the totality of what humanity can verify about the real world, testable by repeated experiment or factual observation, bound to related information by general principles, and – this is the part most often missed – ultimately subject to cause-and-effect explanations consilient across the full range of disciplines. The most democratic of human mental activity, it comprises the nonfiction stories you can take to the bank.

Everyone can understand the process of science, and, once familiar with a modest amount of factual information and the elementary terminology of particular disciplines, he or she can grasp the intuitive essence of at least some scientific



knowledge. But the scientific method is not natural to the human mind. The phenomena it explicates are by and large unfamiliar to ordinary experience. New scientific facts and workable theories, the silver and gold of the scientific enterprise, come slow and hard, less like nuggets lying on a streambed than ore dug from mines. To enjoy them while maintaining an effective critical attitude requires mental discipline. The reason, again, is the innate constraints of the human brain. Gossip and music flow easily through the human mind, because the brain is genetically predisposed to receive them. There is a Paleolithic cogency. Calculus and reagent chemistry, in contrast, come hard, like ballet on pointe. They have become relevant only in modern, postevolutionary times. Of the hundreds of fellow scientists I have known for more than fifty years, from graduate students to Nobelists, all generally prefer at random moments of their lives to listen to gossip and music rather than to scientific lectures. Trust me: physics is hard even for physicists. Somewhere on a distant planet, there may exist a species that hereditarily despises gossip and thrives on calculus. But I doubt it.

The central task of science writing for a broad audience is, in consequence, how to make science human and enjoyable without betraying nature. The best writers achieve that end by two means. They present the phenomena as a narrative, whether historical, evolutionary, or phenomenological, and they treat the scientists as protagonists in a story that contains, at least in muted form, the mythic elements of challenge and triumph.

To wring honest journalism and literature from honest science, the writer must overcome formidable difficulties. First is the immensity and exponential growth of the

primary material itself, which has experienced a phenomenally short doubling time of fifteen years for over three hundred years, all the while coupled with a similarly advancing technology. It has spread its reach into every conceivable aspect of material existence, from the origin of the universe to the creative process of the mind itself. Its relentless pursuit of detail and theory long ago outstripped the minds of individual scientists themselves to hold it. So fragmented are the disciplines and specialized the language resulting from the growth that experts in one subject often cannot grasp the technical reports of experts in closely similar specialties. Insect neuroendocrinologists, for example, have a hard time understanding mammalian neuroendocrinologists,



and the reverse. To see this change in science graphically you need only place opened issues of a premier journal such as *Nature* or *Science* from fifty years ago side by side with issues of the same journal today. The science writer must somehow thread his way into this polyglot activity, move to a promising sector of the front, and, then, accepting a responsibility the research scientists themselves typically avoid, turn the truth of it into a story interesting to a broad public.

A second obstacle to converting

science into literature is the standard format of research reportage in the technical journals. Scientific results are by necessity couched in specialized language, trimmed for brevity, and delivered raw. Metaphor is unwelcome except in small homeopathic doses. Hyperbole, no matter how brilliant, spells death to a scientific reputation. Understatement and modesty, even false modesty, are preferred, because in science discovery counts for everything and personal style next to nothing.

In pure literature, metaphor and personal style are, in polar contrast, everything. The creative writer, unlike the scientist, seeks channels of cognitional and emotional expression already deeply carved by instinct and culture. The most successful innovator in literature is an honest illusionist. His product, as Picasso said of visual art, is the lie that helps us to see the truth. Imagery, phrasing, and analogy in pure literature are not crafted to report empirical facts. They are instead the vehicles by which the writer transfers his own feelings directly into the minds of his readers in order to evoke the same emotional response.

The central role of pure literature is the transmission of the details of human experience by artifice that directs aesthetic reaction. Originality and power of metaphor, not new facts and theory, are coin of the realm in creative writing. Their source is an intuitive understanding of human nature as opposed to an accurate knowledge of the material world, at least in the literal, quantifiable form required for science. Metaphor in the best writing strikes the mind in an idiosyncratic manner. Its effect ripples out in a hypertext of culture-bound meaning, yet it triggers emotions that transcend culture. Technical scientific reporting tries

to achieve exactly the reverse: it narrows meaning and avoids metaphor in order to preserve literalness and repeatability. It saves emotional resonance for another day and venue.

To illustrate the difference, I've contrived the following imaginary examples of the two forms of writing applied to the same subject, the search for life in a deep cave:

SCIENCE. The central shaft of the cavern descends from the vegetated rim to the oblique slope of fallen rock at the bottom, reaching a maximum depth of 86 meters before giving way to a lateral channel. On the floor of this latter passageway we found a small assemblage of troglobitic invertebrates, including two previously undescribed eyeless species of the carabid subfamily Bembidini (see also Harrison, in press).

LETTERS. After an hour's rappel through the Hadean darkness we at last reached the floor of the shaft almost 300 feet below the fern-lined rim. From there we worked our way downward across a screelike rubble to the very bottom. Our headlamps picked out the lateral cavern exactly where Romero's 1926 map claimed it to be. Rick pushed ahead and within minutes shouted back that he had found blind, white cave inhabitants. When we caught up, he pointed to scurrying insects he said were springtails and, to round out the day, at least two species of ground beetles new to science.

In drawing these distinctions in the rules of play, I do not mean to depict scientists as stony Pecksniffs. Quite the contrary. They vary enormously in temperament,

probably to the same degree as a random sample from the nonscientific population. Their conferences and seminars are indistinguishable in hubbub from business conventions. Nothing so resembles an ecstatic prospector as a scientist with an important discovery to report to colleagues, to family, to grant officers, to anyone who will listen.

A scientist who has made an important discovery is as much inclined to show off and celebrate as anyone else. Actually, this can be accomplished in a technical article, if done cautiously. The heart of such a report is always the Methods and Materials, followed by Results, all of which must read like your annual tax report. But up front there is also the Introduction, where the author briefly explains the significance of the topic, what was known about it previously, who made the previous principal advances, and what aspect of the whole the author's own findings are meant to address. A smidgen of excitement, maybe even a chaste metaphor or two, is allowed in the Introduction. Still more latitude is permitted for the Discussion, which follows the Results. Here the writer is expected to expatiate on the data and hypotheses as inclination demands. He or she may also push the envelope and make cautious guesses about what lies ahead for future researchers. However, there must be no outbursts such as, "I was excited to find..." or "This is certain to be a major advance."

Science writers are in the difficult position of locating themselves somewhere between the two stylistic poles of literature and science. They risk appearing both as journalists to the literati and as amateurs to the scientists. But these judgments, if made, are ignorant and unfair. Enormous room for original thought and expression exists in science writing. Its potential is nothing less than the establishment of what Sir Charles Snow called the third culture, a concept also recently promoted by the author and literary

agent John Brockman.

The position nearest the literary pole is that broadly classified as nature writing. With roots going back to nineteenth-century romanticism, it cultivates the facts and theories of science but relies heavily on personal narrative and aesthetic expression. Thanks to writers of the first rank such as Annie Dillard, Barry Lopez, Peter Matthiessen, Bill McKibben, David Quammen, and Jonathan Weiner (a representative but far from exclusive list!), nature writing has become a distinctive American art form.

The pole nearest science is occupied primarily by scientists who choose to deliver their dispatches from the front to a broader public. Ranging from memoirs to philosophical accounts of entire disciplines, their writing resonates with a certain firsthand authority but is constrained to modesty in emotional expression by the conventions of their principal trade. Writing scientists also frequently struggle with the handicap imposed by the lack of connection of their subject to ordinary human experience: few tingles of the spine come from bacterial genetics, and generally the only tears over physical chemistry come as a result of trying to learn it.

Despite the inherent difficulties, science writing is bound to grow in influence, because it is the best way to bridge the two cultures into which civilization is still split. Most educated people who are not professionals in the field do not understand science and technology, despite the profound effect of these juggernauts of modernity on every aspect of their lives. Symmetrically, most scientists are semiliterate journeymen with respect to the humanities. They are thus correspondingly removed from the heart and spirit of our species. How to solve this problem is more than just a puzzle for creative writers. It is, if you will permit a scientist a strong narrative-laden metaphor, the central challenge of education in the twenty-first century. 



A Connection with Earth:

A Study of the Center for Education, Imagination and the Natural World at Timberlake Farm

by Caitlin Goodspeed

It was a blustery day, and I watched as the brightly colored leaves fell slowly through the trees to the ground, swirling and twirling as if they had waited all summer long for this one dance with the wind. Beyond the falling leaves, through the semi-bare trees, I saw a small child, walking alone in silence, taking in her surroundings. Her observant and leisurely nature seemed so natural in contrast to the hectic and

chaotic world that existed just a few miles down the road, where the shops sell everything from electric toothbrushes to powdered potatoes in a box. Here, in this place of natural beauty, this little girl was connecting with Earth in a way that many people do not have the chance to experience anymore. The fresh air illuminated her face with awe and wonder. As she casually strolled down the path, she would stop to look

at the occasional spider's web, intricately designed in patterns never before replicated, or she would bend down to pick up a fallen stick that she would gently drag across the soil as she continued her walk. Where she was going, I do not know. But she appeared to be completely at peace with herself and with the world. In this setting, her imagination was free from the habitual motions of daily living, from voice lessons, soccer practice, and homework, free to wander and play in the natural forest that surrounded her.

In a world so focused on modernization and technology, people still find simple ways to connect with the natural world, as did the little girl described above. Interactions with the natural world cause people to consider the different ways to preserve our natural surroundings for the future. These interactions also allow people to have a new appreciation for the Earth, by living in a manner more conscious of the future. Connecting to the natural world, in turn, raises a number of questions, including those regarding the possible methods of approaching a relationship with Earth. Are there different ways of envisioning the human relationship with Earth from the approaches practiced now? How might an understanding of spirituality, an individual's sense of peace, purpose, connection to others, and beliefs about the meaning of life be incorporated into this strategy? Is it beneficial to teach people at a young age the ways to care for Earth? What sorts of practices and rituals benefit Earth?

At The Center for Education, Imagination and the Natural World at Timberlake Farm (the Center) in Whitsett, NC, the staff promotes this sustainable relationship with the earth predominately among children through educational programs. One of the main components of these programs is spirituality. The staff members at the Center draw heavily from the understandings and beliefs of geologists, individuals whose theology is deeply rooted in geological understandings and beliefs, especially those of Thomas Berry. Accordingly, the staff members at the Center believe that Earth, in its entirety, is sacred. All of the operations, processes, and maintenance of the farm revolve around this belief that Earth is not merely soil and water, but that it is living. This paper will examine the methods by which the Center views spirituality in nature, specifically showing that the Center promotes the concept of "sacred Earth" through theories and

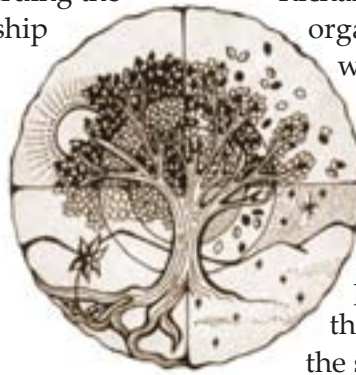
educational programs. By carefully examining The Center at Timberlake Farm, this essay illustrates how the Center promotes the notion of Earth as sacred and how this concept is not only necessary, but also exemplifies a spiritually based way to care for Earth.

On a planet of limited resources, it is important to consider the future effects of present actions. This research provides a method for practicing sustainability in a way that regards Earth as a sacred place that we are to live in as a community. To be able to recognize God in nature and nature in God is crucial to understanding how we should care for Earth. The practices and ecological beliefs of Timberlake Farm provide a practical example for relating to and living in communion with Earth, viewing Earth not as a gift we can dispose of, but rather as a place that embodies the sacred.

Timberlake Farm: A History

Richard Lewis founded the non-profit educational organization, Touchstone Center for Children, with the belief that all persons have natural, creative, imaginative, and artistic capacities that when encouraged and allowed to develop find unique expression in each individual. In a 2004 article entitled "Our First Conversation," he wrote that at one point or another we all have marveled at the mystery of snow and rain, the process of the seasons, or the tides of the ocean. Lewis

suggests that the awe and wonder of the natural world are most expressive during childhood, noting that as time passes and we become occupied with school and the practicalities of daily living, this fascination with Earth fades away. Ralph Waldo Emerson described this transformation in an essay entitled "Nature," saying that "few adults can see nature. Most persons do not see the sun. At least they have a very superficial seeing. The sun illuminates only the eye of the man, but shines into the eye and heart of the only child" (Carroll, Brockelman and Westfall 1997, 32). Emerson speaks of the differences between adults and children by illustrating the divergent ways in which they each see and understand nature; the deep bond that children can make with nature gradually fades as they grow up. Lewis suggests that this union is lost when people begin to believe that their imaginations are useless and, subsequently, use them less. "By forfeiting our playing and our imagining – perhaps we gave up what instinctively allowed us a sense of connectiveness



with these natural worlds” (Lewis 2004, 4). Lewis wonders if something might recapture this instinct to be part of the world rather than simply occupants of it. He suggests that this instinct was more prevalent prior to technological advances made by the human race at a time when people still acknowledged their extreme dependence on Earth. Lewis contemplates the possibility of a new dialogue or way of living in Earth.

This question prompted the first conversations regarding this new human relationship with the natural world, discussed at a series of workshops entitled “The Biological Imperative: Nature, Education and Imagination,” held by Carolyn Toben, Chris Meyers, Thomas Berry, and Richard Lewis. Attendees of these workshops concluded that “at no other time in human history has the question of the human relationship to the natural world been more central. What is needed now is a new way of being with the Earth, a way based on a deeper sense of the world than measurement and survival” (Toben and Whalen-Levitt 2004, 2). The workshops also stimulated thought about community living; however, the most striking revelation was the need for a long-term human commitment to living this way with Earth. This commitment, they decided, would be best expressed through the education of children about the natural world. According to the group, teaching younger generations to live and relate sustainably to Earth was the most effective way of fulfilling this commitment. Toben, Meyers, Berry, and Lewis wanted to teach children ways to keep their imaginations and creative minds active into adulthood. This way, their students could begin this practice early and then raise their children to live with the same mindset that Earth is our equal. The result of the workshop was to create an environment where nature could shine into the eye and heart of every person, beginning with children. Timberlake Farm founders Carolyn Toben and Peggy Whalen-Levitt decided to adopt this commitment by creating

The Center for Education, Imagination and the Natural World at Timberlake Farm. “The Center can become a leading advocate and model, through its programs for teaching children, of a view of educational practice in which the imagination, in all its expressive and unifying capacities, is seen as central to our relationship with the natural world” (Lewis 2004, 5).

The land that Timberlake Farm occupies shares a history with Toben’s family. They purchased 165 acres, located in the foothills of North Carolina, during the late 1960s as a second property in addition to their home in Greensboro. This property was overgrown and unkempt, so the family worked hard to restore it to its natural beauty. They littered gravel roads and trails throughout the property, wrapping them around the ponds, allowing explorers to trek deeper into the wilderness. Toben wrote that “as my family shaped this land, it was actually shaping us. The presence of the hardwoods, the cedars, the lakes, the creatures – they all live within us...this is not a center in which the natural world is a backdrop for our human endeavors. It is the central focus. It’s a very rich and abundant environment” (Spring 2006, 5).

Toben and her husband decided to leave their home in Greensboro and move into an old home on the property; however, in 1999, Toben’s husband passed away, leaving her to wonder what her next step would be. For many years prior



to her time spent on the farm, she was instrumental in creating programs at the North Carolina Center for the Advancement of Teaching (NCAT), a nonprofit organization that created programs for educators. She soon discovered her calling while walking the trails on the farm; she experienced an overwhelming feeling that Earth was missing children and that children were missing Earth. She believed that a separation had grown between the two, and they needed to be reconnected. With a background in and passion for education, Toben decided to fulfill her calling by combining her love of teaching with her love of Earth,

so she created a non-profit organization she called Timberlake Farm Inc. At this point she acquired the help of her friend, Peggy Whalen-Levitt, who boasts a Ph.D. in language and education and who started a course on childhood imagination at the University of Pennsylvania. Whalen-Levitt also worked for years on many different environmental issues and participated at the first Earth Day celebration in New Haven

“Children know about global warming and ozone depletion. But they don’t know the smell of the spring rain or the sound of a bullfrog.”

Connecticut in 1970. The opportunity to work at the farm merged her passion for childhood imagination and her concern for the environment.

Timberlake Farm, Inc. began by offering programs to adults and children, including a membership community and weekend retreats. Additionally, Toben and Whalen-Levitt, both deeply passionate about children, developed Next Generation Children’s Programs, offering Earth walks and summer nature camps on the property. After working closely with children, Toben observed that,

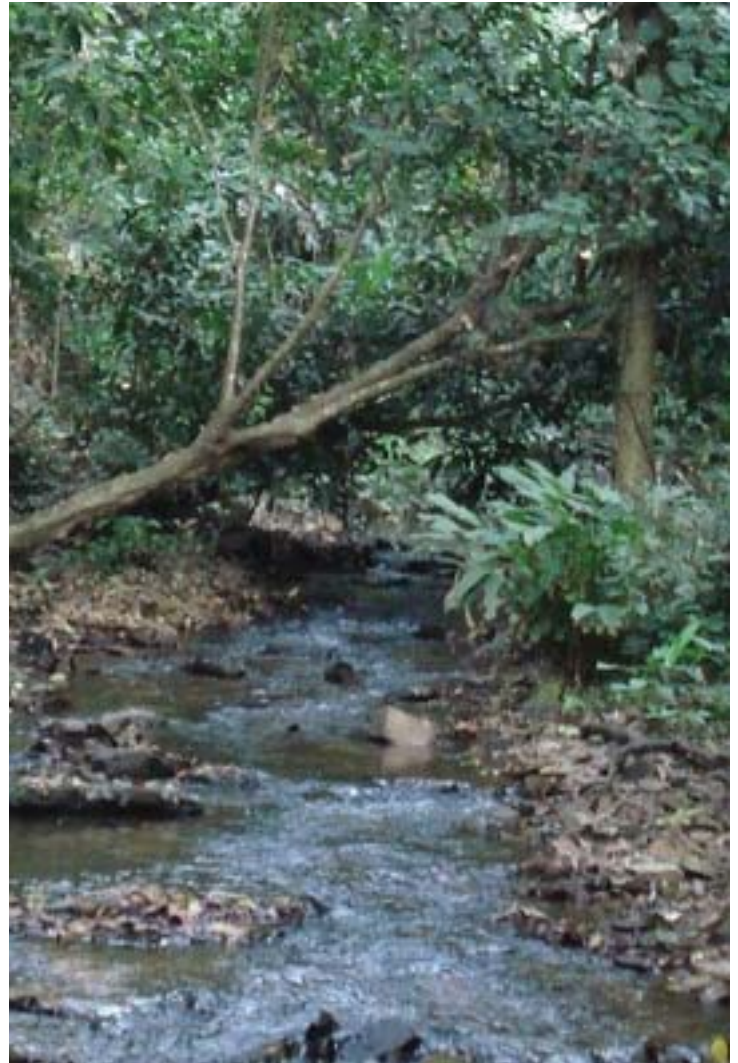
Children know about global warming and ozone depletion. But they don’t know the smell of the spring rain or the sound of a bullfrog. Most children today lack the sense of celebration of the dawn, the sunset, the moonrise, a reverence for life, and growth and the cycles and the seasons. We hope that we are offering what is missing (Spring 2006, 4).

Equipped with a plan, Toben and Whalen-Levitt joined the conversational workshops with Richard Lewis; those discussions resulted in the formation of The Center for Education, Imagination and the Natural World, focusing on students, educators, and their connection to the natural world.

A Word on Thomas Berry

The Center derived much of its philosophical beliefs

from the scholarship of Thomas Berry, an honoree of the United Nations as well, Harvard University, and Elon University for contributions in the field of ecological study. A North Carolina native, Berry profoundly influenced the foundational beliefs of the Center at Timberlake Farm as well as the organization of its programs. Berry, best known for his contributions to the development of ecological consciousness, is a firm believer that the earthly community does not exist solely for the advantageous and unlimited possession and use by humans. He argues the need for an understanding that humans and Earth depend equally upon one another. This simple and undying need for one another creates a necessary relationship between human beings and Earth. Berry’s vision of community embodies all of creation. The ecological community is not subordinate to the human community, rather each is united and connected in an interdependent web of life. Berry expresses his beliefs in a selection of a poem he wrote entitled “It Takes a Universe,”





It takes a universe
To make a child both
In outer form and inner
spirit. It takes
A universe to educate
a child. A universe
to fulfill a child (Berry 2004, 6).

Berry's views offer an alternative to interpretation of the Christian belief in which humans are called to care for and even dominate other species, including plants and animals. Drawing upon Greek thinking, the early Christian theologian Origen (185-254 C.E.), for instance, believed that "the material world was created primarily by God as a kind of purgatory where fallen human beings are educated through trials and tribulations to return to the realm of pure spirit from which they have fallen" (Gottlieb 1996, 109). This interpretation implies that Earth is a prison cell, where human beings must wait for salvation by something greater, according to Origen, God. This attitude neither leaves room to contemplate the idea of

living in community with Earth and its inhabitants nor promotes the idea of sustainability. There are modern Christian articulations of this belief as well. In his thesis, Lynn White, a professor of medieval history at Princeton University, proposed that a "dominate Earth mentality" helps drive Christians to be less supportive of protecting the environment (Boyd 1999, 36). He also argues that the Bible sets the trend for anthropocentrism or human-centeredness. The dominant Earth mentality and the beliefs of Origen hold that Earth serves as a temporary situation for humans; with this understanding, people do not need to tend or care for the planet because they will soon leave it. In many Christian faith traditions, where admission into heaven is the dominant concern, the Earthly condition may be understated. Berry suggests the need to eliminate this concept of domination because it affects the way that humans interact with the natural world. If this ideal stagnates, Berry believes that there is a dismal future for the natural world; the destructive habits of humans will take a toll on Earth's resources (Berry 1988). Society must begin to change this mentality in order to change its actions. Berry notes that humans "have lost our

sense of courtesy toward the Earth and its inhabitants, our sense of gratitude, our willingness to recognize the sacred character of habitat, our capacity for the awesome, for the numinous quality of every Earthly reality" (Berry 1988, 2). The staff at the Center also acknowledges the notion that humans created this disconnection from the Earthly community (Toben and Whalen-Levitt 2006, 1-2). In this shared belief, The Center at Timberlake Farm attempts to provide a place that fosters interaction to cultivate, restore, and heal these relationships between humans and Earth.

This is a sense of presence, a realization that the Earth community is a wilderness community that will not be bargained with; nor will it simply be studied or examined or made an object of any kind; nor will it be domesticated or trivialized as a setting for vacation indulgence, except under duress and by oppressions which it cannot escape. When this does take place in an abusive way, a vengeance awaits the human, for when the other living species are violated so extensively, the human itself is imperiled (Berry 1988, 2).

A Divine Presence

On any given day, the Center houses people who practice an array of religious traditions. With this religious diversity, aligning the beliefs and practices of the Center with each theological perspective might seem problematic. However, Whalen-Levitt explains that

all manifestations of the natural world are modes of divine presence. We don't use the word god, because from an evolution of consciousness perspective, if you are working with multiple wisdom traditions, people will have a different word for that. Some refer to it as God. In the Native American culture it might be the Great Spirit. In Buddhism it might be nothingness. So there are different names for this divine presence. Thomas would acknowledge them all. We also acknowledge all the wisdom traditions, and we look for that common understanding that the natural world holds divine presence (Whalen-Levitt 2007).

By acknowledging the divine presence, the natural world itself, the staff members at the Center attempt to change the structure of human relationships with Earth. Berry notes that

diversity is no longer something that we tolerate. It is something that we esteem as a necessary condition for a livable universe, as the source of Earth's highest perfection....To demand an undifferentiated unity would bring human thought and history itself to an end. The splendor of our multicultural world would be destroyed (Berry 1968, 45-46).

Educational Programs

In his article "Beyond Despair: Leading High School Students Back to Earth" Randolph Senzig, a high school environmental studies teacher for nineteen years, discusses the three trends emerging among his students.



The first is the fact that children now gain experience through television, video games, and computers rather than the outdoors (Senzig 2004, 8). In fact, most studies estimate that children spend thirteen to fifteen hours per week watching television (Hofferth and Sandberg 2001). Other studies report even higher figures, but include time when the television is on but not the primary activity. Due to this new dependence on technology, Senzig argues, children now have a weaker relationship with Earth.

The second trend observed by Senzig among his students is an increased accessibility to food. He notes that "young people find their food in a box from the freezer, a bag of lunch from the fast food restaurant,

canned from the supermarket and prepackaged [for the] microwave" (Senzig 2004, 8). Senzig finds this problematic because young people rarely see the original components of this food. This creates a detachment from the world of farming and spawns ignorance regarding the amount of care and effort necessary to produce food from Earth. They fail to relate Earth to the contents of their refrigerator, further alienating them from their relationship to the natural world (Senzig 2004).

The final trend that Senzig found was that younger generations do not learn basic information about Earth, nor do they learn how to care for it and the inhabitants living in it. This trend may be the most pervasive issue of the future; if upcoming generations do not understand the processes of Earth and display no concern for the environment, then the future of the planet may be bleak. As a teacher, Senzig experienced difficulty when introducing new material to his students. One problem he encountered emerged during a lecture about air and water pollution.

As he explained the various attempts to correct the problems caused by pollution, he found that his students quickly lost hope that they could do anything to improve the situation of Earth. Seeing images of toxic materials and landfills induced despair among his students, which was not Senzig's intention. "This was, as Thomas Berry has stated, 'a moment of grace' for me as I realized that I was missing the mark. I needed to find new ways to help my students reconnect with nature" (Senzig 2004, 8). Senzig sought to aid his students in their struggle to relate to nature and found guidance at the Center for Education, Imagination and the Natural World at Timberlake Farm.

The Center designs its programs to help students and educators alike connect with the environment. In addition, staff members offer counsel to help individuals understand that humans are part of the ecological community, where all things are equal and should be treated accordingly. Over the years, programming at the Center fluctuated as the staff experimented, determining the effectiveness of each activity. There is some level of consistency, however; all of the programs, for adults as well as children, are simple in nature. The Center approaches spirituality with phenomenology

or learning how to be fully present in an experience. This means coming to the natural world without theology or preconceived ideas, being present to what is before you, and paying attention to your experience as you have it (Whalen-Levitt 2007).

Since its inception, the Center developed practices that encourage participants to be more aware of their surroundings. Whether for preschool-aged children or college students, most of these practices begin with moments of silence, usually spent on the trails. "In our culture, people will say, when we tell them that we work in silence... our children will never be quiet. That's what they say. But they [the children] are. The children actually do fine with silence. And we are in silence so that we can notice what surrounds us and we can be present" (Whalen-Levitt 2007). At the Center, the programs for children usually begin with storytelling, allowing the children to enter into a quiet space. Coming from hectic schedules and long, academically challenging days,

listening to a story helps them relax. After the children have calmed down from the chaos of the day, they usually take to the trails in silence, observing their surroundings and enjoying nature. After this portion of the program, the more focused activities occur.

One of these specific programs is Expanding Circles. In this activity staff members take children to a place where they can observe what is near to them and also see quite far into the distance. This allows children to become present and aware of what is right in front of them, extends their concentration gradually to a more distant place, and then returns them to their original view. As in building muscles, this activity helps the children to gain perception. After the activity, they encourage the children to contemplate their observations by creating inner images in their minds and holding them there. Then, the children have an artistic opportunity, affording them a chance to take those inner images and express them in a different way. At the end of the program, there is a period of reflection in which children recall their experiences and articulate their feelings (Whalen-Levitt 2007).

There is a multitude of programs at the Center geared toward children. One in particular utilizes

"If upcoming generations do not understand the processes of Earth and display no concern for the environment, then the future of the planet may be bleak."

children's sense of hearing to help them appreciate the natural world. Toben described the program by saying that,

In one of our nature camps, we did a session of listening in the woods. We had thirteen children ranging from age five to seven. We asked them to listen outwardly [for] sounds they heard and we wrote it down. Then we asked them to listen inwardly and not outwardly at all. And we wrote those down. In the second part, one little boy named Alex said, "I heard ancient fires crackling." A little girl named Sharon said, "I heard ten caterpillars yawning." We went back to our tree house which is the epicenter of the land. They quietly took their watercolors and created pictures of what they had heard. So we had these extraordinary phrases along with their watercolor drawings. This is an important part of the process of nurturing the human being, to help them create their own images out of experience. We acknowledge



the potential of their inner life and seek to allow it to unfold (Spring 2006, 4).

In the fall of 2006, the Center implemented a new program for children called Children of the Forest, an after-school program that gives children opportunities to play outside. The program is based on the Forest Kindergartens of Germany, where small groups of children go outside each afternoon as part of their daily lesson. In this program, children are not taught. Instead, they have the chance to play at free will, which, as Whalen-Levitt observed, can be a time when they learn the most.

Some of the research coming out of Germany is fascinating. The children who have been outdoors for three years are actually doing very well academically compared to the children who were in academic kindergartens in Germany.... They are developing all modes of intelligence rather than narrowing down to the mathematical or verbal at a very young age and squeezing all of the others out (Whalen-Levitt 2007).

Knowing that children play outside less frequently than in the past, Toben and Whalen-Levitt created this program to allow children to experience the outdoors again.

One of the main strengths of the Center is the specially designed programs for work with individual schools, churches, and other organizations. The groups that visit the Center want to integrate the natural world into their programs. They also hope for further development of inner capacities of intuition and imagination in relation to the natural world (Whalen-Levitt 2007). Toben and Whalen-Levitt did not attempt to create a curriculum that was appropriate for every single group, since none of their programs can be translated into one set, written curriculum. Instead, they designed programs, so schools, churches, and other organizations could have programming specifically produced for their particular group. For example, the Center worked with a local Jewish day school, creating a three-year program relating Judaism and the natural world. "We had a group of eighth graders out here last spring who were from a Jewish day school, and they were about to embark on a trip to Israel where they would do a solo time in the desert. So leading up to that,

we did solo time here, and they did some writing out of that" (Whalen-Levitt 2007).

Another example was during the winter of 2005, when the Center's staff created a special program for a group of Jackson Middle School (Greensboro, NC) students. After students completed a book of poetry and photography, teachers decided to let them take photographs at Timberlake Farm. Students captured many moments on their cameras for their project. Last summer, the Center also worked with Holy Trinity Episcopal Church in Greensboro. Rather than conducting a text-based Bible study as usual, they decided to design a creation-based Bible school. The church had a particular interest in Celtic Christianity, a medieval branch of Christianity extensively rooted in Earth. The staff at Timberlake considered these interests and developed a "Celtic, Seven Days of Creation" day camp. These examples highlight the Center's capacity to work with people from many different backgrounds and to create programs that enable participants to engage in the environment around them.



Future of the Sacred Earth

In his book, *The Great Work*, Thomas Berry addresses a time period called the "Eozoic era" where all the creations of Earth will live in complete harmony. If human beings truly desire a mutual relationship with the natural world, then change must occur within these systems in a way that invokes community among all inhabitants of Earth and Earth itself. As Al Gore explains, people must see that "the relationship to the natural world is not a relationship between 'us' and 'it.' It is us, and we are of it" (Toben and Whalen-Levitt 2006, 1). But how should humans restore this relationship that has eroded over the years?

Our children will live, not in our world but in their world, a future world that is rapidly taking on its distinctive contours. Our exploitative industrial world, despite all our scientific discoveries, technological skills, commercial abundance and stock-market advance, is in a state of decline. The long-term survival of our children will depend on a new relationship between the human and the natural

worlds. A change is taking place from exploitative relationships to one of mutual enhancement between the natural and the human worlds. The type of prosperity known through the industrial process of the twentieth century will never again be available (Berry 2004, 7).

The Center for Education, Imagination and the Natural World provides a model for a mutually coexistent community of human beings and the natural world. The practice of silence at the Center is essential in today's world, a place where material desires and technological advances drown out the songs of the natural world. Whalen-Levitt agrees that the Center can play a pivotal role in helping our society form an ecological community. "It is a model. As far as we know, we are the only people working this way in the country. It is actually pretty radical work. It's more sophisticated than meets the eye" (Whalen-Levitt 2007). Much of this sophistication lies in the Center's open-mindedness and dedication to working with various religious traditions. This is an essential element when it comes to relating to Earth, and one that cannot be overlooked. As Roger Gottlieb expressed, before we can attend to the fate of Earth, we must first attend to the hate and violence that have separated peoples because of conflicting religious beliefs. After we address this issue, we can then turn our energies to Earth.

The progressive work the Center does is vitally important because it considers the future of the Earth. If we want our children's children to swim in clean water and wander leisurely through the trees of a deep forest, then we must educate our children now as to how they should interact with Earth. Wangari Maathai, founder of the grass-roots Greenbelt Movement in Kenya, insists that, "the time has come to humble ourselves before the Source, the Great Creator, the God of many names. We must appreciate that all members of the community of living are important to the Source" (Whalen-Levitt 2005, 5).

Caitlin Goodspeed is a senior religious studies and international studies double major. She is the reconciliation and social justice student intern at the Truitt Center for Religious and Spiritual Life. She is a member of Theta Alpha Kappa. She is currently conducting research on missionaries in Thailand.



Works Cited

- Barnhill, David Landis and Roger S. Gottlieb. 2001. *Deep Ecology and World Religions*. Albany: State University of New York Press.
- Berry, Thomas. 1968. *Five Oriental Philosophies*. Albany: Magi-Books.
- 1988. *Dream of the Earth*. San Francisco: Sierra Club Books.
- 1999. *The Great Work*. New York: Bell Tower.
- 2004. "It Takes a Universe." *Chrysalis*. Vol. 1 (Spring).
- 2004. "Our Children. Their Future." *Chrysalis*. Vol. 1 (Spring).
- Boff, Leonardo. 1997. *Cry of the Earth, Cry of the Poor*. Maryknoll: Orbis Books.
- Boyd, Heather. 1999. *Christianity and the Environment in the American Public*. Journal for the Scientific Study of Religion 38 (March): 36-44.
- Carroll, John, Paul Brockelman and Mary Westfall. 1997. *The Greening of Faith*. Hanover: University Press of New England.
- Derr, Thomas. 1996. *Environmental Ethics and Christian Humanism*. Nashville: Abingdon Press.
- Chapple, Christopher. 1994. *Worldviews and Ecology*. Maryknoll: Orbis Books.
- Dwivedi, O.P. 2006. *The Oxford Handbook of Religion and Ecology*. New York: Oxford University Press.
- Gatta, John. 2004. *Making Nature Sacred: literature, religion, and environment in America from the Puritans to the present*. New York: Oxford University Press.
- Gottlieb, Roger. 1996. *This Sacred Earth*. New York: Rutledge.
- 2003. *A Spirituality of Resistance*. Lanham: Rowman and Littlefield Publishers, Inc.
- 2006. *The Oxford Handbook of Religion and Ecology*. New York: Oxford University Press.
- 2006. *A Greener Faith*. New York: Oxford University Press.
- Greeley, Andrew. 1993. *Religion and Attitudes Towards the Environment*. Journal for the Scientific Study of Religion 32 (SEASON): 19-28.
- Grim, John and Mary Evelyn Tucker. 1994. *Worldviews and Ecology*. Maryknoll: Orbis Books.
- Hart, John. 2006. *Sacramental Commons*. Lanham: Rowman and Littlefield Publishers, Inc.
- Hayden, Tom. 1996. *The Lost Gospel of the Earth*. San Francisco: Sierra Club Books.
- Hofferth, Sandra and John Sandberg. 2001. *How American Children Spend Their Time*. Journal of Marriage and Family 63 (May): 295-308.
- Hughes, Donald. 1996. *This Sacred Earth*. New York: Rutledge.
- Lewis, Richard. 2004. "Our First Conversation." *Chrysalis*. Vol. 1 (Spring).
- Martin-Schramm, James and Robert Stivers. 2003. *Christian Environmental Ethics*. Maryknoll: Orbis Books.
- McFague, Sallie. 1997. *Super, Natural Christians*. Minneapolis: Augsburg Fortress.
- Nash, James. 1991. *Loving Nature*. Nashville: Abingdon Press.
- Senzig, Randolph. 2004. "Beyond Despair. Leading High School Students Back to Earth." *Chrysalis*. Vol. 1 (Fall).
- Spring, Cindy. 2006. "Ten Caterpillars Yawning: Interview with Carolyn Toben." *Chrysalis*. Vol. 3 (Spring).
- Toben, Carolyn and Peggy Whalen-Levitt. 2004. "Opening Letter." *Chrysalis*. Vol. 1 (Spring).
- 2006. "Opening Letter." *Chrysalis*. Vol. 3 (Spring).
- Whalen-Levitt, Peggy. 2005. "Tree Pals: A Journey of the Spirit with Wangari Maathai." *Chrysalis*. Vol. 2 (Spring).
- Whalen-Levitt, Peggy. 2007. Interview by author, 30 October, Whitsett. Tape recording. Whitsett, NC.
- Wenz, Peter. 2001. *Environmental Ethics Today*. New York: Oxford University Press.

BUI DAM

by: Andie Diemer

Located in the southeast region of Ghana, a winding, twisting river carves its way through the increasingly arid landscape. The Volta River is simply a twig off the world's largest manmade lake, Lake Volta, that stretches across almost three percent of the country. Many locals wash their clothes, fish, and bathe in the river's water. Yet, when they return home they are still utilizing the power of the lake—though they may not realize it. When they simply flip on the lights in their homes, the benefits of the water from the Volta River shine down upon them; the Akosombo Dam supplies ninety-five percent of hydroelectric power for Ghana, in addition to providing a social and economic atmosphere (Van Edig et al., 2003).

Roger Gocking, a civic and cultural studies professor at Mercy College who has written detailed accounts of Ghana's history, said Ghana's first leader, Kwame Nkrumah, wanted to use the dam as a nucleus around which the country could begin the process of industrializing. The Akosombo Hydroelectric Project began construction in 1961 and promised to provide electricity as well as serve an integrated industry of a local aluminum smelter and bauxite (Gocking 2008). However, once completed in 1965, the dam failed to meet the project's original goals.

Van de Giesen et al. (2001) suggests that the dam increased economic activity by exporting electricity to the neighboring countries of Togo and Benin and creating a permanent electrical grid within the Ghanaian landscape; however, the project also bore serious economic, social, and health costs (Van de Giesen et al., 2001). One major issue was that construction of the dam required the importation of aluminum from a plant in Jamaica. Another problem was that the dam failed to supply electricity for all of the recipients as promised (Gocking 2008). Gocking holds that "the dam could not produce enough power for all of these [electricity]

demands." Since the dam failed to meet these energy needs, "in 1981 another dam was constructed a short distance below Akosombo at Kpong to add another 160 megawatts to Akosombo's 912 megawatts" (Gocking 2008).

The Kpong Dam, constructed between 1978 and 1981, displaced over 6,000 civilians, and the new structure still failed to meet consumer electricity demands (Gocking 2008). Since the construction of the first dam, over 80,000 people have been displaced due to the flooding of entire villages by the dam's enormous reservoir. Despite the relocation of large numbers of people, "the two dams have not been able to supply all the power Ghana needs," said Gocking. "In 1999 and 2000 the Volta River Authority, the government agency that supplies power in Ghana, opened two thermal plants near Takoradi that together supply 550 megawatts, about 30-40 percent of needs" (Gocking 2008).

Thermal plants produce electricity by heating water, typically through the combustion of fossil fuels. When water is heated, it vaporizes, creating steam. The high energy, high pressure steam drives a turbine, producing mechanical work which is converted to electricity using a generator. The steam then travels through a condenser or a large body of water to eliminate excess heat, so that the water can be converted into steam once again. Steam is the driving force behind thermal power plants, and since water is readily available in the Volta Region, steam is a logical option for electricity generation; however, thermal energy is much more expensive than the hydroelectric energy produced at Akosombo and Kpong. Additionally, these thermal plants also require petroleum, which must be imported (Gocking 2008). Even though recent completion of the West African Pipeline creates a cheaper, cleaner natural gas alternative for use in thermal energy production, the technology remains more expensive than hydro-

electricity (Gocking, 2008).

Scholars suggest that there are benefits as well as pitfalls to hydroelectric power generation in Ghana. Gyau-Boakye (2001) believes that the Akosombo Dam has helped Ghana rapidly enhance industrialization and modern development. Other smaller scale benefits from the project include strengthened economic and industrial development, increased accessibility to transportation across the country, lucrative fishing opportunities in some areas due to increased volume of water, higher yielding farming, and flourishing tourism industry due to a more solid governmental foundation (Gyau-Boakye 2001). However, Gyau-Boakye (2001) found that there may be more negative effects—some that the people may indirectly experience on a physical, biological, or social level. In contrast, Anasis (2008) believes that aside from production and irrigation, the dam is “aiding the development of telecommunications infrastructure in rural Ghana, particularly in the western and northern part of the country which are not served well today.”

Gyau-Boakye (2001) suggests that there may be larger physical changes associated with the construction and operation of the Ghanaian dams. He found that the dam projects induced a variety of physical changes. Seismicity changes occur as the dam adds weight to underlying rocks in the lake—potentially triggering earthquakes. Sediment loads are reduced which can expose the piers supporting a main bridge. There may also be morphological changes, for example, should the gradual eastward shift of the river bed accelerate, the consequences may include rapid floods, a shift in water flow directly into the sea, and increased coastal erosion. One final physical change involves the alteration of microclimate weather; the reservoir waters of the dam can encroach on dry land, increasing the emission of heat and causing drastic changes in surface roughness and wind speed.

In addition to changes to the surrounding landmass and weather, there may also be other environmental problems. The construction and operation of the dams may cause a variety of biological and ecological impacts (Gyau-Boakye 2001). One consequence may be an increased number of weeds due to stagnant water; aquatic plants constrict the waterways, making travel difficult. Limited mobility of boats may contribute to a decline in fishery production. The overgrowth of weeds may also increase the occurrence of waterborne diseases,

also affecting the local human population. There is a causal link between the prevalence of weeds and the outbreak of waterborne diseases, such as malaria, onchocerciasis, and urinary schistosomiasis. The latter is a parasitic disease carried by freshwater snails that thrive in stagnant water; urinary schistosomiasis causes liver and intestinal damage to humans. Studies found a significant correlation between the launch of the

Akosombo Dam and outbreaks of schistosomiasis, malaria, and onchocerciasis; the dam generated ideal conditions for the carriers of these diseases. Mosquitoes, prime hosts of malaria, breed more rapidly in standing water. Black flies, which typically breed in areas with low water levels, carry onchocerciasis, a condition that causes blindness among those affected.

There are also various social problems associated with these dam projects. As previously mentioned,

Ghana has experienced the resettlement of 80,000 people from 700 villages. These displaced individuals were relocated to fifty-two different settlement villages where many encountered various feelings associated with the loss of their land. Cultural issues associated with relocation include the abandonment of gods, shrines, graves of ancestors, church buildings, and other fondly remembered places. Resettlement undermined other cultural practices, mainly because youth could no longer experience traditions in their original habitual areas. In addition, resettled populations experienced a decline in economic activity because they lost their previous source of income—their land, crops, and other property. Subsequently, many of these people needed to find new occupations (Gyau-Boakye 2001).

The dam projects do not meet Ghana's energy needs even though they created negative repercussions. “The recent drought highlighted this,” Gocking said. Ghana experienced droughts in 1983 and 1998, forcing power rationing. and in the summer of 2007 the water levels fell to a record low, permitting the use of only two of the six dam turbines (Gocking 2008). Since Ghana does not typically have four distinct seasons but rather a biannual wet and dry season, the consequences of this drought were particularly devastating, since it occurred during the country's typical rainy season—May to October (Van Edig et al., 2003). Although there is a significant correlation between yearly rainfall and water levels, rainfall often acts as a variable; therefore, constructing yet another dam is a mistake in many experts' eyes (van de Giesen et al., 2001). After comparing “hidden” dangers—such as schistosomiasis and loss of traditional



values—to the power and economic benefits, plans to construct a third dam on the waterway have ensued. In fact, the drought expedited plans to establish another hydroelectric power source for the people of Ghana and the surrounding populations (Gocking 2008).

From Gocking's viewpoint, there have been many more negative consequences emerging from the previous dams than benefits. He believes that constructing a third edifice will certainly follow a pattern similar to that of the last two projects. Despite these negative impacts, populations continue to crave more electrical power and government starves for the potential revenue. Subsequently, plans for government collaboration with a Chinese construction company, Sino-hydro, to build a dam on the Black Volta River in Bui National Park in the Brong Ahafo region materialized in 1997. Ground broke in October of 2007, once the government was able to source funding (African Research Bulletin 2008). Completion of the project to install the 400 MW Bui Dam hydro-plant is expected by late 2011 or early 2012. The new construction, located about 300 miles upstream of the Akosombo Dam, will flood about a fourth of the national park upon which it currently sits.

This new dam will likely cause human populations in the region to suffer; more than 2,500 people will be displaced. Experts worry that other negative externalities, or negative unintended consequences, associated with the project may affect the region's fragile ecosystem. In particular, a few specific types of animals will be significantly impacted—potentially eliminating these entire specie populations. Not only will the decline in animal populations elicit an imbalance in the ecosystem, but it is also expected to diminish the tourist industry (Anasis 2008).

One of the largest tourist attractions, the black hippo (*Hippopotamus Amphibious*), will likely experience a decline in populations due to the construction of the dam. Anane notes that there are only two populations of hippos—around 140 total—that inhabit Bui National Park. In Ghana, they are the largest of the remaining hippo populations. "Contrary to widely held beliefs by the dam backers that the hippos and the other endangered species will be relocated when construction of the dam begins, zoologists contend that the hippos cannot survive anywhere outside the Bui National Park due to its unique ecosystem" (Anane). Anane believes that the park cannot afford to rescue and relocate the animals, so the animals may likely die (Anane).

Bennett (2001) argues that Bui National Park is a necessity for the survival of the animals, since they remain "almost completely undisturbed by people and have access to plentiful creeping grasses throughout the year." Completion of construction and rising dam waters

will submerge feeding areas and cause the current 400 hippos to migrate upstream in search of food (Bennett). The Nature Conservation Research Council of Ghana claims the population could successfully be relocated through the capture and transport of the hippos to Weichau, a sanctuary established in 1998; however, Bennett suggests the impossibility of this feat due to size and location of the population.

Once at Weichau, an area densely populated by humans and cattle, the likelihood of survival for the hippos is further reduced since their existence depends heavily on residing in a remote location, away from people and livestock. The sanctuary also borders native Ghana and Burkina Faso, where there is no legal protection for the animals (Bennett). There may also be problems with the availability of food, since the sanctuary is heavily grazed and farmed (Bennett). According to Bennett, "the government and dam constructors are very happy to [designate] Weichau as an alternative home for the animals, but the truth is that unless a way is found for the Bui hippos to remain at Bui, the animals are doomed to die, and the species as a whole is likely to be extinct in Ghana within 100 years." Bennett suggests that in order for Weichau to be a plausible solution, the animals must be carefully transported to a safe compound and the people and animals currently residing in the area must be removed. "The Bui hippos represent the only hope for long-term survival of

the species in Ghana," he said. "Otherwise the displacement of the Bui hippos would result in carnage for both the animals and the people of the Black Volta. The Bui Dam must therefore be abandoned" (Bennett).

Along with the environmental impacts of the Bui Dam

project, there are also other concerns, and, surprisingly, scientists are no longer the only people raising them. Ghanaian Parliament Member, George Nfojoh, believes that building the Bui Dam is a mistake, since the government will spend around 650 million U.S. dollars on the project, borrowing \$270 million (U.S.) from



the Chinese Government. "It is on the same water as Akosombo and will have the same problem," Nfojoh said. During the dry season, November to April, the government official said that rolling blackouts across the nation are not uncommon due to low water levels.

In the traditional and rural village of Sokode Ando, located only about thirty minutes from the water, Chief Togbe Kasa III said his community would largely favor the construction of the new project, since it would help with the blackouts his village frequently experiences during both the rainy and dry seasons. Even though they are located in a very rural area, all of the homes have electricity. "It would be nice to have power all the time," he said. "The [new] dam will give us that." Kwame Boafo-Arthur, professor of political science at the University of Ghana at Legon, argues that the investment itself will have serious consequences as well. "My fear is that we won't be able to pay back the loan to China for the dam," he said. "Ghana is already deeply indebted." Sino-hydro, the construction company involved with the project, acknowledges some of the problems associated with previous dam projects in Ghana. Accordingly, before breaking ground the company created a black fly eradication program to prevent the outbreak of onchocerciasis (Gocking 2008).

Although debate continues over whether the benefits of the dam outweigh the negative repercussions, the project will proceed. Land was cleared and materials were shipped to begin the construction. Even though alternatives to hydroelectric power exist and measures were implemented to ensure the survival of local

animal, plant, and human populations, many people still doubt the overall success of the dam. Gocking "wonder[s] also about the ability of the Volta basin watershed to fill two large dams as it obviously has not been able to fill the one that already exists." Achieving an adequate water level to reach its full capacity of 1020 megawatts is a difficult task. Gocking argues that "never in Akosombo's 43-year history has the dam ever been completely full."

Many developing countries find themselves caught in a moral dilemma between environmental protection and fiscal security. Ghana is a prime example.

Proponents of the Bui dam argue that the country

"Despite these negative impacts, populations continue to crave more electrical power and government starves for the potential revenue."

desperately needs industrialization and energy independence, while opponents retort that the social, environmental, and even economic repercussions of the project outweigh the benefits. The Bui dam, as well as any hydroelectric project, presents a multifaceted, complex issue with various perspectives and stakeholders. The Ghanaian government supports the construction of the dam project, finding that the benefits outweigh

the costs—social, environmental, and economic. After reviewing Ghana's previous two dam projects, this writer hopes the Bui dam will fulfill its energy promises while avoiding the negative consequences experienced in the past. 🙄

Andie Diemer is a sophomore journalism major from Columbus, Ohio. She is the News Editor for The Pendulum, a journalism fellow and Periclean Scholar. She traveled to Ghana over winter term to further her passion for helping others, documenting through photographs and just getting to experience the world.

Works Cited

- African Research Bulletin. Industries: Power. <http://www.blackwellsynergy.com/doi/abs/10.1111/j.1467-6346.2007.01241.x> (accessed March 22, 2008).
- Anane, Mike. Courting Megadisaster: Bui Dam May Cause Havoc. *Environment Reporter*. Global 500 Forum: United Nations Environment Programme.
- Anasis, John. 2008. Potential Telecommunications Benefits of the Bui Dam Project for Rural Ghana. *Wireless Communications* (January): 1-13.
- Bennett, Daniel. The Weichau Hippo Sanctuary: Separating the Fact from the Fantasy. Mampam Conservation. <http://www.mampam.com> (accessed March 22, 2008).
- Boafo-Arthur, Kwame, professor of political science at the University of Ghana at Legon. 2008. Interview by author, 15 January, Accra, Ghana. Lecture.
- Gocking, Roger, civic and cultural studies professor, Mercy College. 2008. Interview by author, 27 February, Elon, NC. E-mail.
- Kasa III, Togbe, Chief of Sokode Ando, Ghana. 2008. Interview by author, 7 January. Sokode Ando, Ghana. Written notes.
- Nfojoh, George, Ghanaian Parliament Member. 2008. Interview by author, Jan. 9. Ho, Ghana. Written notes.
- Gyau-Boakye, P. 2001. Environmental Impacts of the Akosombo Dam and Effects of Climate Change on the Lake Levels. *Environment, Development and Sustainability* 3 (March): 17-29.
- Van de Giesen, Nick, Marc Andreini, Annette van Edig, and Paul Vlek. 2001. Competition for water resources of the Volta basin. *Regional Management of Water Resources* (July): 199-205.
- Van Edig, Annette, Nick van de Giesen, Marc Andreini, and Wolfram Laube. 2003. Transboundary, institutional, and legal aspects of the Water Resources Commission in Ghana. *Center for Development Research*: 1-10.

The Long Trip Home

Environmental Degradation and Sustainable

by John McGreevy

My eyes breathed in the warm glow of seemingly endless mountains merging with the blue Caribbean sky. I stood a mere seven hundred miles from the Miami International Airport, yet all of my senses argued that I had traveled to a different world. With a group of six doctors and nurses, I continued the scenic hike from Layaye, Haiti, to neighboring rural villages. Most of my thoughts were focused on the thrill of delivering a suitcase full of deworming medicine, vitamins, and eye glasses to the first town. This continuous stream of excitement partially suppressed the nagging doubts that served as echoing reminders of how under qualified and out of place I was on a medical missionary trip to one of the poorest and most corrupt countries in the western hemisphere.

Franz, our Haitian guide, spoke up in scattered English that drowned out the sound of the pack donkey's rhythmic hooves. He reassured us that the village of Bonabite was not so far over the next mountain ridge. Apparently there are two distances in Haiti, with mileage measured only in "not so far" and "far." Despite rigorous terrain, the hike was quite enjoyable, and our journey that day of a "not so far" three-and-a-half-hour walk passed relatively quickly. We steadily made our way through what I was told was a tropical forest biome, but I noticed something missing from this rural haven.

"Where are the trees?" Dr. Powelson questioned, completing my thought process. On top of one of the highest points in the area, the mountains appeared a vivid green yet surprisingly treeless. They were instead covered in a short layer of



me:

Development in Rural Haiti



grass that blanketed loose rock and thin soil. A mango tree or small farm would interrupt the constant sea of green every so often, but the vast majority of this “tropical forest” was not a forest at all.

Over the following week I experienced both ineffable tragedies in quality of human life and unbelievable miracles in persevering hope through spirituality. Both were awesomely foreign to my daily life in American society. I noticed many connections between the environment and people of rural Haiti. Lack of basic hygiene and safe drinking water led to countless dermal conditions and burdensome parasites. Destructive timbering furthered the loss of forest resources and soil erosion. This, coupled with the absence of basic farming education, fostered inadequate crop yields and malnutrition. Through it all, the Haitian people held their heads high and praised their Heavenly Father, praying for health, food, and blessings.

After an eight-day trip with seven people to five villages, six hundred children receiving deworming medicine, four airport pat-downs by customs, three hundred eye exams, and two near death experiences involving a raging river and a toppling pickup truck, I had nothing left but a one-hour trip to America. Later that day, a house would replace a hut and carpet, a dirt floor. The parasite-infested creek I called a bath would be replaced by a shower. I would open the refrigerator just to stare at the food. I would walk to the sink, fill a glass, and drink it, knowing it was disease free. At the end of the day, when my silent recollections and quiet epiphanies had filled the last few hours of light,



I would lie amongst my clean sheets with the lights on, all the while knowing that I would probably live a long, healthy life. My trip back to a life of comfort lasted a couple hundred speedy miles. The journey for the people of Haiti is quite daunting but by no means helpless.

During our last mass in Haiti, I listened to one hundred newly found brothers and sisters raising their voices above the sound of pouring rain. The resonance of water playing on thin metal roofing mixed effortlessly with the tune of human voices and

whispered quiet reminders of how intertwined we are with our surroundings. It seemed so obvious in their lives, in Haiti, yet such a distant and alien idea in my life at home. Through it all, I could not help but think that the injustices to the quality of human life I witnessed firsthand were largely influenced by environmental degradation. No matter how bleak the current situation in rural Haiti may be, by working with one another and the environment that fuses us together, we can see a significant difference in this lifetime. 🙏



John McGreevy is a sophomore biology and environmental studies double major from West Chester, PA. He is a member of the 2010 Periclean Scholars who work with villages in Ghana on sustainable development projects. He is also part of the Phi Eta Sigma honors society.

A View from the Road

by Brittany Kordick



The sight of road-kill always makes my skin tingle, but this morning I was crushed by an opossum with babies strewn in her cruel butcher's wake. Four distinct and uniform clumps of existence encircled both their mother and my heart in a sort of empty halo as I drove by. All of their lives had been blended into one unruly patch of fur, bone, blood that stained the road in front of someone's home. Can I be the only one to notice that a family has been opened up by asphalt?

There was a car fast behind me

this morning, and I couldn't stop for the opossums. Tonight the scene remains intact, if a little worse for the wear of the day. No one else has stopped to prevent the passing mutilation either; the owners of the home they blemish apparently look the other way when they pull out of their driveway, rightly confident that a few weeks of apathetic tires and relentlessly concerned vultures will break the bodies into nothing. But for me, the way is now clear, and I have to get out and pick up the pieces.

I can't convince myself that it is enough to bring a crumpled napkin and a fleeting zone of solemnity with me, but that's all I can offer. Before I move them, I pause above my charges and wonder about the impact. Torn and tattered animals are almost invisible, and once all traces are truly carried away, no chalk outlines, no tacky markers, or flowers will suggest gravity. We will eventually pave over the scene and drive on, carrying telltale flecks of fur in our treads while we fly by with full stomachs. The mother

was killed instantly; that much is apparent, but which blow was fatal for the young? It might have been the first fender or a subsequent one. Perhaps the hit-and-run only stunned them; I see the babies clinging to their mother's body before releasing her, resigned to grow as cold as she. What does one family mean when the stiff road-kill parade stretches standard in all directions, pervading the landscape and, so, releasing us from our own standards? I retain my soapbox when I sink back down to the pulpy earth and the immediate task at hand.

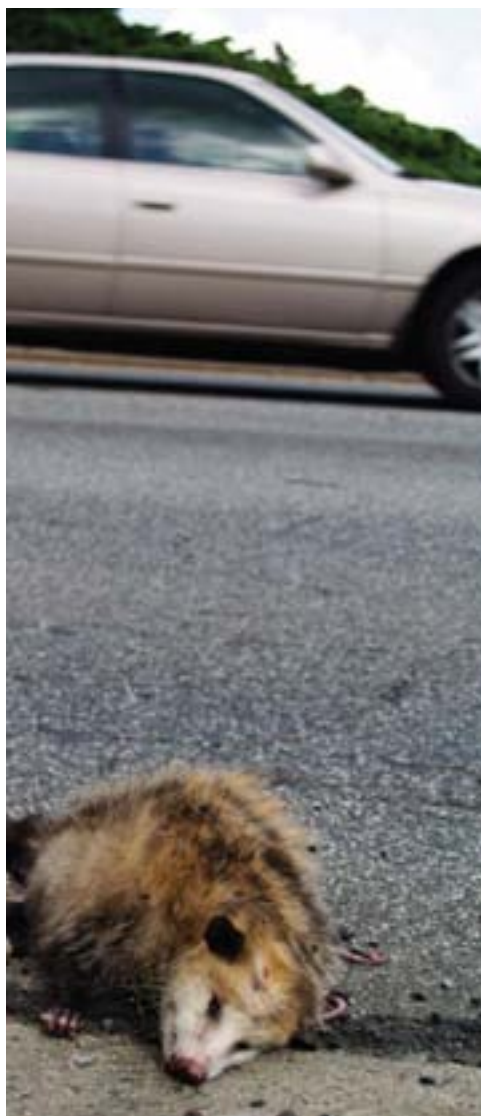
It is cleanest to drag the large one by the tail, so I wrap my smooth paper fingers around her naked sandpaper scales and pull. I imagine I am dragging my own heavy mother as empathy weighs me down and death's rub drowns out the unsullied birds that seem to transcend this indignity. I will the opossum to respond to my humiliation, to reel up and bite my insignificant hand, but she only scrapes behind me miserably. I can take more care with the babies and cradle them like indigestible tacos in my vital napkin.

Something wants me to use my bare hands when I am laying anything to rest, but I can't quite deny a sense of separation and so the paper stays between us like a thin ocean. I put them all down into an overgrown ditch, the young nestled at the torn moon of their mother's underbelly, and I tell myself that they're better off here, that they're closer to where they came from in these weeds. And after I wipe my hands and bitterly turn from a robin's impossibly pressed feathers, I drive away, alive.

* * *

I was coming home too fast and hit an animal in the night. Rounding the final corner before our driveway,

I barely made out a hurried form emerging from the inkiness of the neighbor's tobacco shed. It kept pace with the car for several yards, as though it were chasing me. As I began to brake with feeling, I saw that I was racing a fox.



The car's lazy, streamlined pace challenged the persistent, rhythmic bound of the fox's body. For a brief moment, we drove in harmony, two worlds divided, but running parallel. My eyes frantically jumped from mirror to mirror, trying to gauge whether I should try to outrun the animal or let it escape from me. As I made up my mind, the fox took the initiative and swerved from the grassy periphery to enter my hard-packed lane. It cut

abruptly like an anticipated clock hand and lightly shook the car when we finally collided, meeting me when I was nearly at a stop.

In horror, I stepped from my vehicle, napkin in hand, but I could find nothing tangible to save or mourn. The fox had left no trace, but possibilities flooded my head. A dead fox. A dying fox. A broken fox. I don't know which one I cried for as I got back into my car and limped down my driveway. Still, I had to purge myself, and so, absorbed the darkness that had swallowed the animal up and away from my harm. My worries rushed down my cheeks, sweeping up my salty virtue and carrying it to some churning tributary inside. As waves licked my burning skin, the wild forest night rang in my ears like a mother, like a beast, and ushered me faster to my own safe haven.

* * *

A few months ago, I was inspired by a barn pinstriped in morning light, and I stopped beside a vacant cornfield to take a picture. It was winter, explaining the harvest fiber carpet, but not the similarly forsaken barn or the deer I found on the way back to the car. The animal was a parched and decaying island in the middle of a husky sea, and the field had clearly been its bed for some time. The doe's body was oddly preserved—dryly devoid of life, not wet with the fleshy memory of feelings departed. The fur stood upright in a dandruff clump puzzle with more than a few pieces missing, but though what was left looked real, the creature had managed to somehow age beyond death. I didn't find anything worldly or unworldly in its face. It couldn't move towards me or away from me, so I came closer and introduced myself.

Tensely rooted by the vacuum of its eye socket, I stood hovering on the verge of plunging into that black



hole. Through my dizziness came a fervent comprehension that this deer was finished everywhere, even as its lips pulled back in a snarl so defiant as to blur the line between predator and prey. Shaken, but secure in the knowledge that there was nothing to violate with my presence, I instinctively felt for my camera. After rearranging the corn stalks to fit the frame better, I captured death without offering consolation or accepting tragedy. A petty reverence was unborn and a deeper one recognized: a netherworld mapped out in one dead deer's eye revealed that the river Styx rains over everything.

* * *

Another day, I foresee another obligation and slow beside another animal. Even from a distance I can see that this one maintains some dimension. As I get closer, it becomes clear that this opossum hasn't been reduced in any way as it unsteadily straddles parallel lines with even weight. It has one

toe over each line and is obviously lucky to be alive, but I've become imbibed with necessity and my rage dissipates as I see that I will not have to reduce it further with any impromptu roadside service.

I come to the opossum bearing the synthetic womb of a blanket



and a swollen spirit. Drinking in its stricken fury? pain? fear?, I gently drape these maternal offerings over the animal and wish I could resolve more this way — by erasing casualty with the shade of my eyelids and returning the favor. But watching my blanket tremble with life, I hesitate only a moment before I wrap my gently evolving hands into an embrace that is somehow acknowledged by the shivering form.

Speaking to the opossum to comfort myself, I put it back where it belongs and experience the same surge of vitality it apparently feels. I watch confidently as the opossum's awkward coat-hanger waltz merges with the trees, then I return to my vehicle. But as I mount the road's shoulder, ruthless beams shatter the night behind me, cutting through my new faith. I'm suddenly torn, and turning back to the faithful darkness that conceals the opossum's fate, I wonder which animal I should follow. 🦇

Brittany Kordick is no longer attending Elon University, but still enjoys writing creatively. She has moved to Pittsboro, NC to start a sustainable farming operation with her boyfriend. They have chickens, goats, pigs, rabbits, and lots of vegetables...so far. Buy local and from Contrarian Farm!

STUDENT POETRY

Writers of Elon show their colors poetically

The Cartographer of Winter by Sarah Cox

Last night I exhaled into that rare, long-awaited snow and at midnight I stepped into the woods, into the braille of laden pine arms dimpling solid moonlight. Behind silver curtains, the pond rang stiller than death and I wove among low branches, parting powdery winter dresses to pass from one world into the next.

In the dark's bright ice-flush I could imagine needing nothing more than these few paths through the woods, the silence of creatures overcome by their sudden, new clothes. But still I walked and thought of you, wondered if you stood in the snow too, bearing the weight of the blazing, blown-out sky and breaking open with stifled desire.

This morning I went out before the melts to track animals and found two sets of prints— a rabbit and something larger. For yards of drifts they ringed the pond together, and then they parted. Unable to choose a direction, I gave up the chase, but then small feet like quivering ghost pads skittered and disappeared under every bush I passed.

I think the rabbits must have mapped the land last night in some intuitive act of cartography. They must have lain in great arcs under the stars, taken by the sink and chill of each step, wide-eyed at their one chance to walk safely with the prints of another creature and be recorded together, just briefly, until the drip and sludge of the next warm sun.

Primitive Camping at Eno River by Molly C. Dickinson

I curl in my sleeping bag like a blade of grass seduced by flame. His back is to me, mountain-quiet, a better shelter even than the taut wings of the tent he taught me to stake in the dark. Outside us, the trees are clacking their black limbs against the purple back of evening, and the sound of the wind wound through them has swallowed the winter rushings of the river. The hushed jingling of a rescue bell bounds through the night, swung from the scruff of a hang-tongued dog learning his hunt.

No one is lost here. The trails are hard worn leading homeward. The stars slip silently into the bowed haze of a city half-risen over the horizon like the glow of an electric moon. But here, once, hunched ancestors marked the river as we marked the wooden posts that brought us here. They saw by the moon the mappings at their feet, compassed this canvass of stone and tree, the arrowed trails of deer prints winding to water.

I press through my layers, curving to fit the heat of his body, feeling, in the rise and fall of him, the clock of his breathing, utterly found. And in the smallness of our bodies against the hardened earth, as unknown. As lost as we sought to be here; our breath beading like stars on these dark walls, the wind carrying our scent towards the river, the last ashes of our match-lit fire rising like snowflakes into the frozen air.

Winter Planting by Alyse Knorr

We got up early one morning
to plant white iris in our garden.
It was January, a month before you left,
and I didn't know flowers
could grow in air that cold,
but you said "wait," and handed me
two yellow work gloves that smelled like dirt.

We dug holes in the frozen ground
and dropped the seeds in without ceremony.
Each time I dumped fresh earth
on top of one, I felt
the strongest urge to say goodbye.
When I see it again, I thought,
it will be something different.
We made the holes in rows of three,
and you said you felt like a grave digger
when the wind made us shiver and bend lower.

The spring before, we would go out there
to plant daffodils, dewberry, and tulips.
The flowers bloomed pink and orange then,
and there was something beautiful in the way
they bent over with the wind and back again.
Nothing was hard about it:
the sun shone, so the flowers bloomed,
gave us bouquets for the kitchen table
and long stems to twist
into wreaths for the front door.

But that winter, that morning,
we planted iris together.
You dug faster than I could,
piercing the ground and slinging dirt
away until each hole was deep enough.
The air stung my face and I tasted
icy wind in my throat. It felt
too cold to be out there digging,
but your work gloves on my hands felt good,
like a second layer of you around my fingers.

Let's go back to April, I thought,
but you just said, "My fingers are getting numb."
When we finished, I stuck the
colored paper card in the plot —
a glossy picture of an iris,
with its Latin name below it
typed in green italics.

As we walked back to the house,
I looked behind me and saw the card
sticking out of the empty black soil,
a tiny white dot in the big square of dirt.
It stood silent over the earth
like what it really was —
a tombstone in reverse,
lonely, promising something
that never did grow there.

Learning to Read by Molly C. Dickinson

The night is turning overhead, its stars
a Braille for seeing eyes, for reaching fingertips,
illiterate, unfolding in the dark
to touch and learn. Through the Milky-Way smoke
of our breath I watch your eyes read the sky
as if it were a poem. You point as if
to punctuate the lines that rhyme
the sound of peepers singing with
the drone of traffic from the highway, saying,
"This'll be our constellation."
You rewrite it in the air above us; tracing
a single sideways M (or W);
a valley joining twin mountains; a sigma
we let stand for how the fox comes up
behind us, pauses with one black-gloved paw
raised, like a maid opening the door on flushed
lovers, and turns politely back the way it came.

Sarah Cox is a senior English/Creative Writing major interested in poetry and cross-genre writing, contemporary art, and rewilding initiatives. She plans to spend her post-graduate life learning to grow and find her own food. Her poetry also appears in *Colonnades* and *The Albion Review*.

Molly Dickinson is a graduating creative writing and literature major. In addition to *Visions*, her poetry has appeared in *Colonnades* and at the Sigma Tau Delta conference in Louisville, KY. She is more than happy to spend her evenings with a certain camping enthusiast, to travel long distances for the people who've always mattered, and to dream of empty calendars and book jackets.

Alyse Knorr is a junior English and journalism double major from outside Atlanta, Georgia. Alyse enjoys reading and writing poetry, and after Elon, she hopes to further her education and obtain an MFA in creative writing so that she can pursue a career in academia.



A Report of the Efforts of Several Conservationists in North Carolina:

The Role of State and Local Governments in Advancing Environmental Literacy

by **Kristine Silvestri**

The United States contains a population of environmentally illiterate individuals. The average American lacks basic knowledge of environmental issues and problems. Typically, this type of knowledge deficit promotes inaction and stagnation. Significant advances in the realm of environmental protection are unlikely without the backing of the general public; however, this need not be a permanent situation. Americans need to be re-educated about the natural world. The strategy most likely to garner success in closing the environmental knowledge gap is to encourage the spread of environmental education and literacy.

According to the National Environmental Education & Training Foundation (NEETF), environmental literacy is the cumulative knowledge of environmental terms and issues that affect environmental behavior (Coyle 2007). The NEETF is a private non-profit organization created in 1990 by the United States Congress to advance environmental education. In September of 2005, the organization published a 130-page report entitled, "Environmental Literacy in America,"

incorporating over ten years of data. Findings indicate that incorrect or outdated environmental myths may impact almost eighty percent of average Americans, and only twelve percent can pass a basic quiz on awareness of energy topics (Coyle 2007).

The NEETF attempts to alter these numbers using a variety of strategies, including training, advocacy, networking, school campaigns, and youth projects (Coyle 2007). Each avenue contains different aspects of environmental education: environmental awareness, basic environmental knowledge, and environmental literacy (Coyle 2007). According to the committee that formed NEETF, "in the coming decades, the public will more frequently be called upon to understand complex environmental issues, assess risk, evaluate proposed environmental plans, and understand how individual decisions affect the environment at local and global scales" (Coyle 2007). Consequently, changing mindsets and behaviors of Americans is imperative in order to live more sustainably with nature. State and local governments play a vital role in establishing the mechanisms and strategies to achieve this goal.

Acknowledging the fact that many green advocacy and awareness groups are not governmentally affiliated, this paper analyzes the effects of state government, local government, and school districts of North Carolina on the level of environmental literacy and education. The evidence presented includes basic environmental research and print and Internet resources, in addition to personal interviews of several individuals who directly impact environmental education—Sarah Yelton, Donna Ancuta, Misty Green, and Brenna Goggin. This research aims to investigate the careers of these particular individuals by assessing job structure, influences on decision making, obstacles, and effectiveness. Additional aims include determination of the rationale for employment and the importance of this work for the average person. Finally, and most importantly, this paper serves as an in-depth examination of environmental education, considering the feasibility and efficacy in effecting environmental change.

Sarah Yelton is the K-12 environmental education program manager in the State Office of Environmental Education. She works in conjunction with the North

Carolina Department of Environment and Natural Resources (NCDENR) to implement educational programs and training across the state. Yelton provides an interesting perspective on issues regarding environmental education. As the head program manager, she interacts with a myriad of public servants, including government officials, school districts leaders, and teachers across the state.

Donna Ancuta, a first-grade elementary school teacher, and Misty Green, a teachers assistant, both provide a pertinent viewpoint regarding environmental education. They work closely with children, the benefactors of environmental education programs. The teachers themselves are quite different from one another. Ancuta has over twenty years of experience and is highly distinguished in her profession, while Green is a young teacher-in-training, with less background and expertise.

Lastly, Brenna Goggin, is the Stormwater SMART education coordinator for eighteen member governments. These Stormwater SMART managers reside all over the United States as a result of a federal mandate. She tries to provide a more grassroots and hands-on approach to increasing environmental literacy. One of her main goals is to improve civic engagement in rural and suburban areas.

The state government of North Carolina strives to achieve higher levels of environmental literacy by utilizing public educational systems, primarily in the elementary and middle schools, through the cooperation of administrators, faculty, and staff. Yelton works through NCDENR to implement programs across the state. She frequently uses the NEETF report, "Environmental Literacy in America," as a guide when

addressing issues using statewide and local approaches. Yelton believes the amount of money and time spent on environmental literacy in North Carolina is "significantly higher than other states considering most don't



even have these kinds of programs." Despite her status as a high ranking state worker and program manager, she has no employees working for her, nor do her four peers. The state has not allocated sufficient funds to increase her program's workforce. Her job entails coordinating, managing, and organizing nearly all of her individual projects without any assistance.

Yelton's position requires a master's degree, in addition to three years of experience in the implementation of regional projects. Working with four other program managers in the state, she acts as the environmental liaison between organizations and school boards.

Her main goal is to enhance teacher education in environmental literacy by working directly with faculty through preparatory programs. Working cooperatively with the Department of Public Instruction (DPI) and school districts, she aims to address the importance of including the environment in the classroom. Yelton argues that environmental education increases academic achievement, fosters better behavior, and cultivates experience with real world issues. She also believes these teachings facilitate well-rounded and knowledgeable students who will likely become active citizens in adulthood.

Morally and ethically, Yelton adheres to the practices of the North American

Association for Environmental Education (NAAEE). According to their Web site, they believe in "teaching people how to think about the environment, not what to think" (NAAEE 2007). By utilizing innovative teaching methods and non-confrontational approaches, the NAAEE attempts to familiarize citizens with their role in making a difference in their environment. Yelton uses this organization's guidelines to better understand her own role and to outline her professional responsibilities to her organization and to her clients. She follows six basic guidelines: 1) be an example of an environmentally literate individual; 2) understand the progression of the

Sarah Yelton's Six Guidelines for Teaching

- 1) Be an example of an environmentally literate individual
- 2) Understand the progression of the field within the past 30-40 years
- 3) Be knowledgeable on numerous approaches to implementing school programs that take into account student needs and differences in learning styles
- 4) Understand it is not your role to lecture on what is right and wrong, but rather encourage people to think ethically for themselves
- 5) Inspire passion within teachers and be responsive to their needs
- 6) Encourage assessment and evaluation of the programs in which teachers implement in order to see progress



Donna Ancuta, a first grade elementary school teacher at Cornatzer Elementary

field within the past thirty to forty years; 3) remain knowledgeable about various approaches to implement school programs that also account for differences in student needs and learning styles; 4) do not lecture people on ethics but rather encourage them to think ethically for themselves; 5) inspire teachers' passions and be responsive to their needs; and finally 6) encourage assessment and evaluation of the programs implemented by teachers to determine progress.

Much of Yelton's work occurs during what she calls "conference season." She notes that the academic school year, especially the beginning, boasts numerous meetings hosted in various regions. The activities range from school visits for teacher training to workshops designed to incorporate the environment into the current programs of local government. Additionally, Yelton notes the importance of establishing powerful contacts in the state and local governments, especially during this time of year, since these individuals have the power to render environmental legislative changes.

Theoretically, Yelton is available by phone or email 24 hours a day. She

provides her 1,500 person list-serve with new and pertinent information and studies. She claims that she is willing to go almost anywhere at any time to provide instruction on her program, needing only to have an opportunity arise. Yelton also believes that her skills in writing, public speaking, research, and her knowledge of the structure of the educational system in the state have elicited success in her endeavors thus far. She feels that her extensive contact with the public via e-mail, phone, and personal visits, including her most recent work with elementary schools, is vital to her environmental education project.

Other governmental agencies have begun to work with elementary schools as well. Donna Ancuta, a first-grade teacher at Cornatzer Elementary School, works with the North Carolina Office of Soil, Water, and Conservation (another NC Environmental Department). Ancuta says that once a year the Department hosts a poster and essay contest for students, providing an opportunity to integrate environmental education into the classroom. She is a firm believer that environmental education is crucial to

her students because it "helps to raise awareness about the world around you."

Ancuta is a top educator in the state of North Carolina. In the 2005-2006 school year, the Davie County School System named Ancuta Teacher of the Year. She was also a northwest regional finalist in North Carolina for the same honor. Well versed in elementary education, Ancuta brandishes twenty years of teaching experience. She receives requests from newspapers for interviews and from other school districts to join their faculties. She believes that statewide support for environmental studies should continue, if not increase. Thus, she emphasizes environmental education with her students (Ancuta 2007).

One of the best ways to teach students about the environment is through hands-on experience, field trips, and the repetition of information (Yelton 2007). Ancuta takes students on a minimum of three field trips a year, at least one dedicated solely to the study of the environment. This past year she took her students to Baa Moo Farm where her first graders milked cows, fed baby calves with



bottles, identified farm animals and listed resources they produce for us, took a wagon ride, and picked pumpkins for their use in a science experiment. The field trip served as an ideal introduction to environmental literacy because first graders, who cannot understand complex concepts like ozone depletion, get basic environmental education through hands-on experience. Prior to the trip, Ancuta prepared students for their visit using different types of media such as movies, books, and class discussions. Once at Baa Moo Farm, Ancuta then reinforced the material her students had studied. For instance, at the end of each experience, Ancuta asked the students questions to help them retain information. In addition to immediately reflecting on material that they learned, students will also continue to study it periodically throughout the year.

Ancuta also mentors future educators such as her teaching assistant, Misty Green. Green finds that it is difficult to maintain these field trips and environmental activities. After the No Child Left Behind Act (NCLB), she believes that there is increased pressure from administrators to teach math and reading. Ancuta also notes the difficulty when integrating topics like environmental education into the classroom. She believes that NCLB pressures teachers to focus on preparing students for standardized tests, rather than allowing flexibility in lesson plans and activities.

Ancuta suggests that test preparation may inhibit the development of critical thinking skills on a variety of topics. Yelton also found that national guidelines and curriculum requirements may prohibit her from doing her job efficiently. Yelton believes it is difficult to justify the importance of “extras” like environmental science compared to language arts and math. When working with the DPI, which controls curriculum requirements, Yelton maintains that concession for these extras is difficult due to the mounting pressure from the federal government for higher standardized test scores. Ancuta, too, denounces the use of these report cards, as she feels they reflect badly upon schools. The 2004-2005 North Carolina Report Card reported that Cornatzer Elementary School, where Ancuta teaches, performed on average four to eight points lower in reading skills than some other schools in the Davie County District (“NC Report Card”).



Upon receiving these low ratings in Ancuta's elementary school, the administration attempted to elevate reading scores by creating the “accelerated groups program” (Green 2007). The accelerated groups program consists of two-hour reading group sessions, where students join smaller groups according to reading ability and then work with a faculty member. Green believes that these “accelerated groups take up too much time” and get “repetitive for students and teachers” alike. The administration requires this activity twice a day, every day—a total of twenty hours a week. While still adhering to the program, Yelton suggests that teachers can also incorporate environmental education by selecting books with environmental messages. Ancuta also integrates other concepts into mandatory requirements (Green). Not only does this solution offer students an opportunity to study additional topics, but Green also suggests that students may benefit further from this out-of-the-box thinking. According to Green, creative, passionate teachers are more successful at teaching their students.

She also notes that believing in what you teach will make your students believe as well. Changing student behavior, according to Yelton, requires inspiring teachers to change their own.

The state's attempts thus far to promote environmental activism and knowledge in today's youth have been successful in their small scopes of influence; however, large-scale change in this area requires additional labor and resources. Teachers need both fiduciary and policy support from federal and state governments to increase the scope of environmental education, especially for environmental fieldtrips and lesson plans. In addition, other state employees must acknowledge their roles to promote environmental progress. Although the aforementioned individuals have surpassed their peers in environmental education, the state as a whole could be more influential. Some potential state-wide strategies include increasing access to workshops and handouts for the public, increasing media coverage of green initiatives, promoting green legislation by government officials, and emphasizing the role of the public in conservation of water and energy.

However, the state is not solely responsible. To increase

environmental literacy across North Carolina, the burden must also rest with local governments, specifically Councils of Government (COGs). A COG is a “voluntary association of units of local government” that works in conjunction with adjourning local government organizations to address issues (Cox and Rosenfeld 2001). Originally funded by the federal government, current funding of COGs lies with the state.

Brenna Goggin, a representative from Piedmont Triad Council of Government (PTCOG), is the Stormwater SMART Education Coordinator for eighteen member governments in seven counties. The 1987 amendments of the federal Clean Water Act led to the creation of the Stormwater SMART program. The original mandate spent two decades successfully reducing “point source pollution,” or pollution coming from a specific point, like the outflow of water treatment plants (PTCOG). The current focus of the bill is to decrease “non-point source pollution,” or pollution from many areas at once, such as polluted water runoff into drinking facilities or lakes and streams. Non-point source pollution, especially from agricultural runoff,

“is the leading source of [negative] water quality impacts” according to the Environmental Protection Agency (EPA).

An unfunded federal mandate, called the National Pollution Discharge Elimination System (NPDES) Phase II, requires the implementation of a storm water management program that adopts six fundamental areas to foster change: “public education, public participation, illicit discharge detection and elimination, construction site runoff control, post construction storm water management, good housekeeping in municipal and county operations” (PTCG). To comply with this mandate, North Carolina addresses water pollution issues through a basin-wide approach, in which local communities in North Carolina with populations over 1,000 people, including twenty-six counties, must assess and manage the quality of the stormwater that drains from property, flows into storm sewer systems, and discharges to area waters (PTCG). Accordingly, Goggin finds that “people need to be more aware of what a watershed is, how it functions, and what effect poor watershed condition can have on their own lives, health, and activities.”

Along with her duties as a Piedmont Triad representative, Goggin heads the Cape Fear River Basin stormwater program that, according to the N.C. Office of Environmental Education, covers a population of roughly 1.8 million people, 31 thousand total acres, and approximately 6,400 streams and rivers. Goggin holds a bachelor’s degree in communications and political science as well as a master’s degree in public affairs. She asserts that success in her position requires strong writing skills, a master’s degree, a background in government, and professional real-world experience.

Although there is no professional handbook explaining proper behavior or ethical dilemmas, Goggin believes PTCOG provides employees with a basic understanding of professionalism. The office outlines the expectations of PTCOG workers, suggesting cooperation and helpfulness among all employees. Randall Billings, the Executive Director of PTCOG, in coordination with five other planners, attempts to educate employees regarding objectivity in politics and specific policy matters. He recommends employees simply answer specific questions and provide nonpartisan information.

Goggin’s largest project in the fall of 2007 was the North Carolina Big Sweep, the nation’s first statewide waterway cleanup. Since inception, North Carolina Big Sweep boasts nearly 220,000 volunteers and removal of over seven and a half million pounds of trash from North Carolina watersheds. According to the North Carolina Department of Corrections, inmates alone during the spring of 2002 cleaned approximately 7,000 miles worth of roadways and collected over 81,000 bags of trash. Other volunteers include adopt-a-highway, churches, schools, local governments, businesses, and individual citizens (“Inmates Bagging Trash in Fall Litter Sweep”). North Carolina’s Big Sweep takes place biannually in areas across the state (North Carolina Big Sweep).



Programs like the Big Sweep not only provide the opportunity for community engagement, but also serve as a reminder of our disconnection from the water sources that supply our daily needs. Indoor plumbing and sewage systems have forever changed our direct link to streams and rivers as the main form of drinking water. Many people fail to realize the importance of rivers and streams because they have instant access to drinking water. In fact, these waterways are crucial to the long-term sustainability of the earth as we know it.

Clean waterways are crucial to maintaining a diverse and rich ecosystem, a necessity for the survival of the food and life cycles. Healthy waterways allow small aquatic insects and organisms to flourish; these tiny creatures decompose organic materials such as animal remains, twigs, and other types of biomass. Not only are these organisms essential for the end of the life cycle, these decomposers also serve as the main food supply for larger aquatic creatures such as fish, which subsequently feed various woodland creatures. Without clean rivers and streams, ecosystems cannot maintain a natural equilibrium, in the worst cases causing the extinction of a species. Pollutants can also cause the depletion of essential nutrients in the surrounding soil and contamination of the stream bed sediment, negatively affecting vegetation alongside the streams and rivers.

Although overall the Stormwater SMART had been a success, Goggin had hoped for a better turnout at the Big Sweep. Thirty-three volunteers participated in the first Big Sweep event including twenty state workers and thirteen Girl Scouts. Although she appreciated the turnout for a first-time-ever event, she wanted to boost the level of participation. Organizing the first events was time-intensive—months of planning, networking, and advertising—and failed to produce the desired results, so Goggin decided to systematically evaluate her strategy.



She concluded that Stormwater SMART needed a better strategy but realized that there are “various directions that the program can go in, and are now trying to choose which direction that is.”

One strategy utilizes guidelines from NPDES Phase II to help PTCOG cultivate public involvement and community outreach activities. Another route involves networking with influential individuals to increase citizen participation and interest in the program. According to Goggin, the latter plan allows for flexibility, longevity, and ultimately success. She believes that program success may also require addressing the concern of public administrators, such as program logistics, guidelines, regulations, funding, and shortage of environmental literacy within the population.

Other obstacles for the program include DPI and federal regulations affecting the education system, since these codes constrain direct progress in schools (Goggin). Phase II regulations already require bi-annual cleanups, reduced levels of pollution, and increased public involvement. Goggin worries that with new federal mandates, in addition to her current responsibilities, her work load would be insurmountable. Another concern

is the low levels of funding allocated to the Stormwater Smart program. In 2004 PTCOG received a grant to fund Stormwater SMART for five years, but they have no financial support after funds are exhausted in 2009. The program may acquire another grant; however, there is no guarantee. They plan to continue their efforts, using the remaining capital and worry about future funding when the time comes.

Although Goggin finds this to be a significant issue, she believes the program may have a larger concern. She fears that the public does not understand its own role in environmental problems. Coyle (2007) also finds that:

By far the biggest problem in the level of environmental knowledge of Americans is not a lack of knowledge of terminology or even of environmental facts....Instead, environmental education is more about understanding important causal relationships—what might cause air and water pollution, the ramification of recycling, [or] what contributes to species loss....This understanding of casual connections is the single biggest problem in the environmental knowledge gap.

Goggin believes that curtailing the public's environmental apathy lies in educating the future citizens and decision-makers of the country—children and teenagers; however, she remains hopeful that people of all ages can understand the environmental consequences of their actions. She receives questions via e-mail from concerned citizens; examples include, "What do I do if someone is dumping into a storm water drain?" or "What can I do to protect the wetlands?" Very rarely does she receive negative responses about her work. In fact, once people understand exactly what she does, they are motivated to join the cause. However, Goggin finds explaining what she does and why she does it time consuming. She believes that low levels of environmental literacy may prevent comprehension (Goggin).

Multiple studies suggest that the public does not understand basic environmental terminology (Coyle).

One *National Geographic* study found only fourteen percent of the public to be familiar with the term "non-point source pollution" (Coyle 2007, 14). Another study conducted by the NEETF in 1997 and 2000 asked participants to define a "watershed," then provided several multiple-choice responses. Findings indicate that only forty-one percent of respondents answered correctly, and thirty-five percent could not even make a logical guess (Coyle 2007). In light of these

staggering statistics, programs must not only address environmental problems such as water pollution but also educate the public. By targeting citizens and schools through programs like Stormwater SMART, both are addressed simultaneously (Goggin 2007).

Both Goggin and Yelton share goals as well as concerns. Each wants to increase environmental literacy by targeting the educational systems and citizens of North Carolina. Both believe that regulations from state and national governments and funding inadequacies may constrain the progress of their work. They share a common issue associated with pursuing more funding—neither wants to anger supervisors or politicians. Most importantly, both unceasingly fight to motivate the public to demand positive changes for the environment.

Garnering public support requires help from the media. The media must dispel environmental myths and fallacies and increase press coverage on environmental issues and conservation programs. Both Yelton and Goggin acknowledge that media plays a crucial role in making large-scale changes. Coyle suggests that "the media supplies a steady stream of sometimes complex and sometimes oversimplified environmental information that lands upon a fairly sketchy and unreliable base of pre-existing knowledge." Vivid pictures, dramatic sound bites,

powerful consumer campaigns, and visible public debates perpetuate environmental myths.

The media may also entrench in the minds of the public the false notion of a "David-and-Goliath syndrome" where meek environmentalists successfully topple unjust industrial giants to save the planet. Although this image pervades American movies and television, there is little evidence to support the outcome. Coyle suggests that media influences combined with a pre-existing cognitive structure allows for the formation of these myths and their appearance as fact.

The media must begin to present more realistic and practical coverage of environmental problems. At times the public can't see the forest for the trees. Stories about environmental issues need to explain the larger picture of environmental problems, complete with the role viewers play in creating the problem. Goggin believes that the main

focus of the media should be to help Americans reassess their priorities, to aid in re-establishing their connections with the natural world. Yelton, too, finds that although the media supplies extensive information, the classroom creates far fewer misconceptions than the media. Goggin also believes that there are other avenues other than media for acquiring information.

However, the media is not solely responsible for the environmental dilemma, a lack of knowledge and

poor ecological health are also contributing factors. The overarching problem is more complex, and blame cannot be concentrated in one specific area. Governmental incompetence, insatiable industry, and a slothful society are all contributors to the dire planetary condition. Possibly a product of environmental ignorance, many people refuse to make even small efforts, such as not littering, recycling, and conserving energy and natural resources. However, many people, like the volunteers in North Carolina's Big Sweep, attempt to make a small dent in the environmental problems facing the planet.

Are these efforts sufficient? Each person must understand his or her role in saving the earth and must reconnect with the natural world. Although some may be more at fault than others, all people, in some way, contribute to the planet's environmental stress. Some waste water during long showers, some refuse to recycle, and some leave lights and appliances on when they are not in use, but we must re-train ourselves to overcome temptations of immediate gratification and remember the long-term necessity of valuing Earth.

State and local governments play an important role in making the world a better place. Thomas Jefferson said, "The care of human life and happiness, and not their destruction, is the first and only object of good

"Curtailing the public's environmental apathy lies in educating the future citizens and decision-makers of the country—children and teenagers."



government.” The ecological health of the planet is fundamental to the well-being of human life and happiness, so essentially, environmental issues are governmental issues. Good administrators must understand the significance of their position in creating viable programs and strategies to foster a higher quality of life for their constituents; however, Goggin suggests that the responsibility does not solely lie with government. She notes that “[environmental issues are] a lot bigger than [can be solved in] this office. We need more people to help and understand. More people to talk about it and actually care.”

Despite the rising popularity of environmentalism in the media, among the public, and within the legislative arena, the task of solving environmental problems is far from complete. Can we go farther still, not only maintaining our current environmental conditions but actually restoring some of the damage to the planet? The answer to this question may lie in environmental education. Many of the conservationists discussed in this paper suggest that

action requires knowledge. Change is possible; the world just needs creative, motivated people to begin the process. Margaret Meade said that “a small group of thoughtful people could change the world. Indeed, it’s the only thing that ever has.” Brenna Goggin, Sarah Yelton, Donna Ancuta, and Misty Green would likely agree.

Each of these individuals engendered small changes within their various fields—an elementary school, a watershed, and an entire educational region. The thread connecting the ideas of each of these people is knowledge. The public must understand environmental problems as well as care about finding solutions. As previously mentioned, many statistics show that Americans lack sufficient knowledge regarding environmental concepts. If knowledge is power, then the citizens of the United States seem quite powerless indeed. Americans are environmentally illiterate; they must regain this knowledge!

Environmental education can provide the avenue for empowerment in various ways. Teachers, impress upon your students an understanding and respect for the natural world. Use the outdoors as an alternate classroom, allowing students to experience the gifts of the planet firsthand. Policy makers, provide the resources for environmental education. Create policies that help rather than hinder the abilities of educators and conservationists. Media outlets, provide a complete and accurate portrayal of environmental issues. Utilize your viewership to inform the public and elicit support regarding pressing environmental problems. Citizens, take advantage of your power and influence. Ask questions, educate yourselves, hold your government accountable, vote, and, most importantly, protect your well-being by protecting the environment. 

Works Cited

- Ancuta, Donna. 2007. Interview by author, 14 October.
- Piedmont Triad Council of Governments. Be Stormwater SMART. <http://www.stormwatersmart.org/index.htm> (accessed October 29, 2007).
- Cox, George H., and Raymond A. Rosenfeld. 2001. *State and Local Government: Public Life in America*. Belmont: Wadsworth.
- Coyle, Kevin. 2005. Environmental Literacy in America. Washington D.C.: The National Environmental Education & Training Foundation.
- Dressing, Steven A. 2003. National Management Measure for the Control of Non-point Pollution from Agriculture. Washington D.C.: Environmental Protection Agency.
- Goggin, Brenna. 2007. Interview by author, 10 October.
- Green, Misty. 2007. Interview by author, 15 October.
- NC School Report Card. Cornatzer Elementary School: 2006-2007 Profile. <http://www.ncreportcards.org/src/servlet/srcCreatePDF?pSchCode=310&pLEACode=300&pYear=2006-2007> (accessed October 29, 2007).
- North American Association for Environmental Education. Homepage. <http://www.naaee.org> (accessed October 29, 2007).
- North Carolina Big Sweep. North Carolina Big Sweep: Two Decades of Environmental Stewardship. <http://www.ncbigssweep.org/geninfo.html> (accessed October 29, 2007).
- North Carolina Department of Correction. Inmates Bagging Trash in Fall Litter Sweep. <http://www.doc.state.nc.us/new/2002/releases/fallLitterSweep.htm> (accessed April, 23 2008).
- North Carolina Office of Environmental Education. Discover North Carolina’s River Basins. <http://www.ee.enr.state.nc.us/public/ecoadress/riverbasins/riverbook.pdf> (accessed April, 23 2008).
- Yelton, Sarah. 2007. Interview by author, 25 September. Phone interview.

Kristine Silvestri is a sophomore from Flemington, N.J., double majoring in political science and public administration, with potential minors in African/African American Studies and leadership. She is a founder and coordinator of the Elon Green Service Team.

Book Recom

Comparing Green Guides: Find the guide that's right for you

Wake Up and Smell the Planet: The non-pompous, non-preachy Grist guide to greening your day Edited by Brangien Davis and Katherine Wroth with *The Green Book* by Elizabeth Rogers and Thomas M. Kostigen

by Ashley Leasure

For someone attempting to become environmentally conscious, green guides provide insight into greening one's everyday life. Many people want to make more sustainable choices in their lives but are unclear as to how to achieve this. *The Green Book* and *Wake Up and Smell the Planet* offer simple ways to make more environmentally friendly choices; even purchasing the books represents a natural resource-friendly choice. (These books are both printed on 100% recycled paper and *Wake Up and Smell the Planet* is printed with soy ink.)

For the newbie environmentalist, *The Green Book* provides a well organized way to make a number of small choices towards a sustainable lifestyle. The book begins with a foreword by William McDonough and Cameron Diaz, then provides some basics on sustainability, complete with definitions of the terminology used throughout. The guide groups our everyday activities into categories, each represented by one chapter in the book. Each of the twelve chapters begins by presenting the big picture on why the subsequent suggestions are important. The guide also sub-categorizes each chapter for easily accessible answers to a myriad of environmental questions. If you wanted to know how to throw an eco-friendly party, you could look in the entertainment section for information on invitations, the shopping section for gift packaging and environmentally friendly beer and wine choices (if you're of age to drink alcohol, of course!), and the health and beauty section to decide what products to use to get dolled up for the bash. One great feature of this guide is the reference section at the end of the book, which provides Web sites, again organized by chapter and subsection, so you can search for more information on a specific topic.

For the veteran environmentalist, *Wake Up and Smell the Planet* offers a more in-depth discussion of eco-friendly choices, starting from the time you wake up to the time you hit the sack. Although this book does provide an index for finding specific topics, the guide caters more to those who plan to read it in its entirety. The guide is laced with humor throughout, so even if your life is fairly eco-friendly already, the book is entertaining and informative. With clever section titles such as: foiled again; reheat wave;



what's vegetarianism got to do, got to do with it; and achieving the big o: why is organic food so pricey, this book provides clever, in-depth insight on sustainable choices. Not only does *Wake Up and Smell the Planet* make suggestions regarding more environmentally friendly products and techniques, but it also provides statistics and facts on why non-eco-friendly choices are harmful to the planet. This book also supplies the reader with specifics on environmentally friendly products, complete with additional Web sites and books for further reading. For example, if you were curious about purchasing eco-friendly cleaning supplies (although *Wake Up and Smell the Planet* also suggests making your own), the guide recommends Bioshield, Earth Friendly, Ecover, Seventh Generation, Naturally Yours, and Simply Green (it even furnishes the Web sites to research pricing of the products).

Both of these guides supply extensive information on ways to make your life more eco-friendly. Neither guide is exclusively for the "newbie" or "expert" environmentalist; however, each uses different means to achieve similar ends—greening your life. If you're looking for a humorous read with factoids about an eco-friendly lifestyle or specific product ideas, *Wake Up and Smell the Planet* would be a likely choice. If you want a well-organized, comprehensive guide for a copious range of environmental topics or a sort of reference book to find answers to specific questions, then *The Green Book* would more than fulfill your needs. Either way, both of these books are excellent additions to the library of any earth-conscious person.

Ashley Leasure is a senior Elon Social Science Fellow majoring in political science. She is an active member of Pi Sigma Alpha and Pi Gamma Mu. She plans to attend law school after graduation, concentrating on environmental law. She is the lead editor of Visions Magazine.

mendations

The Weather Makers:

Reviewing the Clarity and Science of Tim Flannery's *The Weather Makers: How We Are Changing the Climate and What it Means for Life on Earth*

by Maggie Landy

The Weather Makers is a readable, scientific work discussing important environmental issues with a straightforward approach. Flannery, an Australian biologist and paleontologist, admits to his previous skepticism regarding global warming but reassesses this notion in this book. The book begins by transporting readers to Mt. Albert Edward, one of the highest peaks in New Guinea. Flannery offers a detailed account of the harsh changes that have occurred in the area over the last several decades. He uses this and other firsthand experiences to provide evidence of climate change. Flannery supplies further support by describing the bleaching and subsequent death of coral reefs around the world due to unnaturally high water temperatures, as well as the extinction of various species worldwide. He offers further evidence of climate change by noting recent, extreme, and dangerous weather patterns never before experienced to this degree.

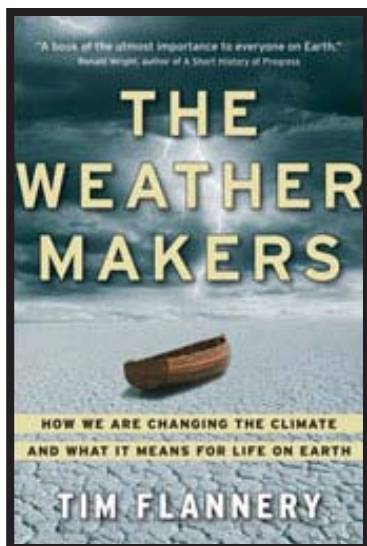
Flannery also provides background on climate change, noting the role of anthropomorphic contributions to

increased greenhouse gases composition, such as methane, water vapor, nitrous oxide, and carbon dioxide. Carbon dioxide has received the most attention with regard

to climate change, and Flannery discusses the ongoing problems associated with increased carbon dioxide emissions. He also addresses several misconceptions surrounding this issue. Climate scientists around the world agree that levels of carbon dioxide are indeed increasing, and Flannery suggests that these increases could result in a rise of global temperature of about 5 degrees Fahrenheit.

In addition to a clear presentation of facts and statistics, Flannery also conveys practical suggestions to tackle the rise in greenhouse gases, such as driving a hybrid vehicle or switching to a more environmentally friendly electricity provider. He also encourages utilizing renewable power sources such as solar, wind, and geothermal power. Flannery is hopeful that we can avoid serious climate crisis and believes that it is a lack of understanding that prevents us from taking action.

Flannery presents important information and suggestions without an elitist tone. He humbly admits the incompleteness of his ongoing work. He notes that there are new scientific advances made every month, making it difficult to have a complete conversation regarding climate change; however, he abhors the notion that lack of information excuses inaction. Instead, he argues that we have enough information now to act wisely. This book offers a discussion of climate change, including anecdotal as well as scientific information, to inspire rather than coerce readers to make changes to save the environment.



Maggie Landy is a sophomore at Elon University. She is a corporate communications major, and a member of Phi Mu and Periclean Scholars 2010. Maggie is originally from Athens, Pennsylvania.

QUICK READS

GOT JUNK? Avoid the Landfill and



Many people find themselves discarding perfectly useful possessions, especially when moving into a new living space. Rather than transporting old stuff to the landfill, though, why not find someone to reuse it? This is the fundamental concept behind The Freecycle Network™, a grass-roots, non-profit organization dedicated to building “a worldwide gifting movement that reduces waste, saves precious resources and eases the burden on our landfills while enabling our members to benefit from the strength of a larger community.” Local volunteers manage each of the local groups, and although the concept is to give away thingamajigs for free, there are copious rules to ensure the safety and security of the members. The organization boasts over 4,300 local groups with over 5 million members in more than 75 countries. With their extensive membership, on a daily basis the organization keeps over 300 tons of waste out of landfills. All together in the past year alone, this would amount to a pile 4 times the height of Mount Everest!

To join Freecycle or to learn more about the organization, please go to www.freecycle.com.

Tech Update: Utilizing Energy From Unique Sources

These are not your typical energy origins—no petroleum, coal, or any other fossil fuel. New technological developments allow for electricity generation from unexpected sources. The everyday movements of humans generate a substantial amount of energy, so using textiles, dance floors, and gyms help recapture the energy that would otherwise be wasted.

Nanofibers woven into cloth carry the hope for an “electrici-T-shirt,” which generates energy from the wearer’s movements. Researchers aim to produce up to 80 milliwatts per square meter of fabric, potentially providing enough power for an iPod. Darpa, the US defense research agency, is also attempting to utilize this technology, exploring ways to collect energy from soldier’s boots.

Other eccentric energy endeavors include a sustainable night club in the Netherlands where dancers provide the majority of the building’s power through an electricity-generating dance floor. In Hong Kong, a fitness center uses the energy produced by its members; exercise machines transform the energy created by the gym-goers into electricity. The inventor suggests that an average person can produce up to 50 watts of electricity per hour. This energy is then used to power the building’s lights.

Creating your own energy by moving about in your clothes, dancing in a night club, or working out in a gym seems to be the technology of the future. Not only will you reap the health benefits from these activities, you can also ensure that satisfying your electricity needs will not produce harmful fossil fuel emissions.



Sources: Associated Press, Grist, BBC, Nature News, Readers Digest, Voice of America.



Life is a Classroom Who Needs Walls?

by Caeli Connelly-Campbell

My environmental vision for the future paints a new picture of a classroom. In this classroom there are no chairs, no desks, no dry erase markers that squeak. In this classroom there are birds and flowers and laughter. The classroom of the future is not a classroom at all, it is the Earth herself.

One of the greatest obstacles standing in

the way of the revival of Earth's health is a lack of education and in turn, a lack of compassion. The future of this world and all the people in it depends upon the emotional connection we have with the Earth, and many people lack the opportunity to find this connection. When children go to school, they sit in a classroom and learn the importance of reading

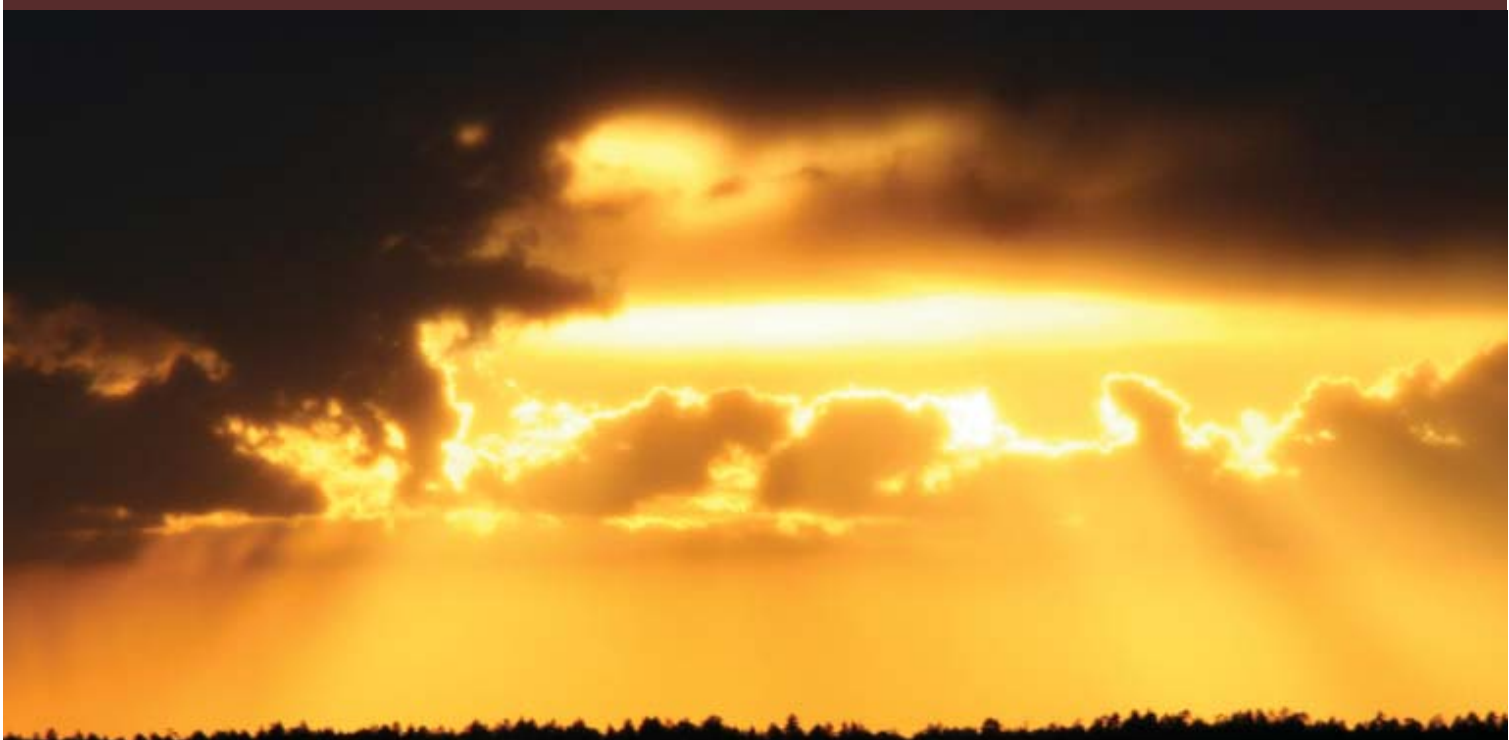
and writing, of math and science. But where in their education are they taught about the great offerings of the Earth they walk on every day? If the public education system incorporated agriculture, children would develop an early relationship with this planet. Perhaps at the start of the school year, teachers give each child a seed to plant and throughout the year it is that child's duty to care for and befriend that plant. When we create a personal connection with the natural world, it, in turn, becomes a part of us. Try to imagine life without best friends, without family, without pets. These beings are deeply rooted into our souls, and when one of them is taken away, it is almost as though a part of our own heart goes with it. The Earth should be included in this group; when a tree is cut down in the rainforest of Peru, we should mourn for that tree.

In indigenous tribes, each child is given a name associated with the natural world—an animal, plant, an aspect of the weather. What a wonderful tradition to have your namesake be an intrinsic relationship with the Earth. In order for us, as citizens of this modern world, to build that essential relationship, we must be given the opportunity to explore Earth and all of her offerings. When children go out to play, we must let them play in the dirt. Let them hold the soil in their hands, feel it between

their fingers. We must let go of the idea that dirty is bad; when in reality the presence of dirt is essential to life. Instead of having high school students take the SAT as a college entrance exam, let us have students write a memoir of their personal bond with Earth. And instead of spending our college years studying for finals in front of a computer screen, we should spend them listening to the sound of the wind and watching raindrops soaking into the ground. Maybe after we take enough time to notice the amazing things occurring before our eyes each moment, then we can begin take what we learn from those moments and bring them into our institutional education system.

The incorporation of environmental issues into education is essential—not just the political and social issues regarding the environment, but the real fundamental teachings that the environment has to offer. This new idea of classroom and education will allow each individual to discover her own connection with the Earth. The personal bridges that we build within ourselves, with other creatures, with other life, are the windows that will open to a different way of thinking—a way of thinking and being that includes all forms of life on this Earth, a way that will give back to this world the respect that it has so selflessly given to us. 🐾

Caeli Connelly is a junior philosophy major, Spanish minor. She is a member of the Elon University Dressage team and Phi Sigma Tau philosophy honor society. She hopes this article will help people form their own definition of education and to speak out on causes important to them.



After Amnesia: Re-membering the World

An Essay by Evan Webb

My environmental vision for the future roots itself in the magic of the land. For all around us, right where we live, miracles occur. The land, like an artist, expresses herself in forms of ten-thousand stripes and songs. From the robins and cardinals which announce the dawn to violets nestled in shade to the ancient white oak trees which beckon us to listen for wisdom, we inhabit a truly wondrous place.

But in this society, other things occupy and distract us from the life that unfolds around us. Televisions blare inane babble, the Internet sucks us into dark cubicles and rooms, newspapers announce the tides of the stock market, schools standardize rather than educating out our most beautiful talents, and monetary concerns pull us into jobs which drain instead of fulfilling us. With the grueling pace of contemporary life, little time remains to fall in love with the places we inhabit. Perhaps this is why, instead of entering into positive, mutually-fulfilling relationships with the land, our society seems

"With the grueling pace of contemporary life, little time remains to fall in love with the places we inhabit."

dead set on the rape of every part of Earth, filling every stream and river with toxins, creating countless "dead zones" in the oceans, strip mining away mountains and, with them, rich cultures, paving over vast lands for parking lots, turning ecosystems into lawns and monocultures, and deforesting the entire planet until we have successfully transformed the once-fertile Eden into a desert.

I have heard a saying, "Join the Resistance: Fall in Love." Indeed, falling in love with the land in this time, just as human activities threaten to annihilate this enchanting place, feels strange and perhaps even enraging. More than just a readjustment of our sentiments to feel fuzzy-hearted at talk of "Gaia" and "Earth," love takes commitment, compassion (meaning "to suffer with"), and a readiness to fight in defense of the lands and seas we love. As our beloved forests, meadows, rivers, oceans, and mountains nourish us, so, too, do they honor us with the responsibility for

ensuring their continued health, and, in the face of the insatiable hunger for so-called “natural resources” of Industrial Civilization, this will undoubtedly take resistance. In fact, as Industrial Civilization caves in from its own weight, it will take revolution the likes of which no humans have witnessed before — a complete upheaval of all dominant political and cultural institutions.

Electricity, and with it the various gizmos and gadgets of contemporary life, iPods, computers, cell phones, televisions, cars, will disappear. Governments will falter and give way to bioregional political organizations that look less like the hierarchies of the modern nation-state and more like the strange anarchy of the Forest: without management, an emerging order flows from finding our niches and playing them well. Humans will again move softly across the land, moving in small bands that blend in like deer walking in the woods. DIY (do-it-yourself) punk and craftster ethics will flower, as human groups creatively breathe new life into the cornucopia of junk left over from Industrial Civilization. We will take up the challenge of bioremediation, slowly working to aid in the healing of lands poisoned and stripped by civilization. We will live in truly democratic, human-scale communities, where inclusive conversations and consensus, not “majority-rules” voting, mark decision-making. We will enter into relationships with our brothers and sisters in the more-than-human world. Plants once considered weeds will magic into delightful food and medicine, and animals once called nuisances will partner with us in the game of the hunt. We will sing and dance and tell great stories in celebration and praise of the many gifts and wonders of the land. We will again share in the grief and joy of the land as Our Family.

In case you find this unimaginable, unrealistic, or both, I recall that our indigenous ancestors and the indigenous peoples worldwide who still struggle to

maintain their traditional ways of living and knowing in the face of globalization lived in their land for thousands, tens of thousands, and even millions of years without destroying it. Furthermore, they did this not through the brute force of governments, but through egalitarian social organizations that rooted themselves in ecological values (as suggested, *In the Absence of the Sacred: The Failure of Technology and the Survival of the Indian Nations* by Jerry Mander). They even contributed positively to the health of their

ecosystems. In a world where environmentalism frames itself as reducing human destructiveness towards the planet, to imagine a society that has a positive impact on their surroundings must strike us as unfathomable. But why? All animals, plants, fungi, and bacteria contribute beautiful patches to the quilt of life, why should humans live any differently?

Danger and strife will certainly line the path towards this kind of society, but what adventure comes without daring and risk? The scars we receive on the way will serve to remind us of the perils of life-out-of-balance, and our descendants will undoubtedly circle around campfires and tell the strange tale of how humans once lost their way in the snare of civilization, and,

just as it seemed that all was lost, the land and seas delivered us from our folly. For in this return back to Earth, we will have the support of the rest of the lifeworld, who, since the dawn of civilization, has been calling us back again and again — “Come Home, Dear Ones! Come Home!”

Let us answer that invitation and return. What a great journey to embark upon! 



Evan Webb is a senior Religious Studies major. He works as an activist with the groups Students for Peace and Justice and Rising Tide North America on ecological issues. He also works regularly in the Elon Community Garden.

WHO'S COUNTING?

Biodiversity

by Doug Redington

Biological diversity is the variety and variability among living organisms and the ecological complexes in which they occur.

- U.S. Congress Office of Technology Assessment, "Technologies to Maintain Biological Diversity," 1987

Invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. -EPA/USDA

Alien species means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem. -USDA

Endangered species means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man. -Endangered Species Act of 1973



		Number of Species by Country		Number of Invasive Species		Number of Endangered Animals/Plants		Land Area (sq. km)	
Russia	25,536	111	24/0	16,995,800					
China	51,278	187	28/0	9,326,410					
U.S.	238,535	430	33/22	9,161,923					
Afghanistan	3,533	40	14/0	647,500					
Iraq	1,651	32	18/0	432,162					
Ghana	6,438	40	10/0	230,940					
Costa Rica	54,642	56	15/0	50,660					
Haiti	4,629	31	4/0	27,560					
Brazil	71,815	109	21/44	8,456,510					
South Africa	47,788	116	21/1	1,219,912					
Madagascar	26,604	55	14/0	581,540					
Ecuador	43,878	73	21/0	276,840					
New Zealand	28,164	204	11/0	268,021					

Sources

100 of the World's Worst Invasive Alien Species. <http://www.issg.org/database/species/search.asp?st=100ss> (accessed May 13, 2008).

CITES species database. <http://www.cites.org/eng/resources/species.html> (accessed May 13, 2008).

Global Biodiversity Information Facility. May 2008. <http://www.gbif.org/> (accessed May 13, 2008).

The World Factbook. <https://www.cia.gov/library/publications/the-world-factbook/> (accessed May 13, 2008).



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The Elon Center for Environmental Studies provides opportunities for students and faculty to work with outside partners on projects focused on environmental education and stewardship. The Center seeks to strengthen the professional development of Elon students as well as promote environmental stewardship, educate the public and private sectors on environmental issues, and create partnerships in expertise for research and consulting. The Center also provides a forum for discussion of local and regional issues and serves as a clearinghouse for environmentally related information.

The Elon University Environmental Studies Program offers both a B.A. and B.S. degree in Environmental Studies, blending scientific foundations with an appreciation of society's needs and concerns. Students enrolled in the Environmental Studies Program take a balanced, interdisciplinary core of classes grounded in ecological understanding. The program's strength comes from an emphasis placed on considering the environment from many perspectives.

