

From paper to trees:

How literature has developed forestry, agriculture, and wildlife conservation in the United States.

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BIOL 406/

Honors Program Experiential Learning Option

01/24/2023

## Abstract

Literature and the natural sciences, while traditionally held in separate spaces, are not that different in their goals, especially the shared goal of pursuing truth. Agriculture, forestry, and wildlife conservation in the US especially have been heavily influenced by the arts in their development. This comprehensive literature review was conducted and spans from 1599 to the present day showing the influential literature of the United States and the colonies preceding it. An analysis of the career of Margaret Cavendish revealed the initial push for works of Natural Philosophy (science) to be written in common tongue and the Shakespeare play *As You Like It* revealed an early and influential calling of the pastoral just prior to the pilgrimage to the Massachusetts colony. An analysis of literature of the United States during the years of the founding especially through the rise in Agrarian almanacs, personal letters of Thomas Jefferson, and the poetry of Philip Freneau demonstrate that the age of enlightenment in the America's demonstrates a commitment to finding reason in the natural world and finding beauty there also. An analysis of the literature of the romantic period and the start of the progressive movement continues the work of the last century and finding the beauty in nature then seeking to protect it thus entering the preservation vs. conservation discussion. The Literature of the mid to late 20<sup>th</sup> century focused on natural resources in one of two ways. Firstly, as a civil right and something to protest on behalf of, and secondly as something that can be escaped into showing the natural world again as a turn towards the pastoral. The Literature of the early 21<sup>st</sup> century is not fully

written yet as there are many questions as to whether post 9/11 America is in a new literary movement. However, one way to pool the results early is to analyze writings from undergraduate colleges and universities. Due to these results agriculture, forestry, and wildlife conservation have benefitted from literature and art that is readable and digestible to the public en-mass it is possible that other natural sciences could also benefit from moving in that direction as well, therefore educators should analyze existing curriculum to ensure students are prepared for a future of communicating complexities in intelligent and simple formats.

## **Introduction**

Literature is what people have used for millennia to import thoughts and experiences into the hands of others, without requiring them to have the same experiences or to occupy the same mind as the author. For scientific and cultural movements this makes literature and the movements within it vastly important, as it allows one person to speak to countless others without having to speak with each one face to face simply to express one thought. Imagine Shakespeare and Shakesperean translators having to, instead of writing his plays, go and meet every person who has read or watched one of them, recount the sometimes-three-hour drama and then move on to the next person. Literature allows these conversations to happen without the author being in the room or focusing on the individual reader or viewer.

For scientific literature there are diverse ways the “science” can be expressed. The most useful for experimental research is scientific or academic reports. Reports tell the reader all but only the necessary details of the experiment or research, such as the methods, results, and the findings. This, however, is not the first kind of scientific literature or even the most effective

when it comes to expressing ideas to audiences outside the scientific community. Other methods include creative non-fiction writing, poetry, individual letters, book reviews, novels, TV journalism and even play-writing.

In the United States, literary movements have been either the driving force behind movements or leading expansions in the fields of agriculture, forestry, and wildlife conservation. Some of the most famous authors to bring forward these expansions include J.J. Audobon, Thomas Jefferson, Henry David Thoreau, John Muir, Gifford Pinchot, and Marjory Stoneman Douglas, along with many others and even some influential writers from across the pond in Europe. Many of the authors that this project has probed into lead or contributed to major literary and conservation movements including the Naturalist/Progressive era which birthed the U.S. Forest Service, The National Park Service, The Sierra Club, and the Conservation Corp of the 1930s and 40s.

Written literature and the preservation of it is symbolically one of the greatest examples of a commitment to truth. It shows that not only was this occurrence something the author believes and is willing to tell, but it can stand up to editors, readers, critics, and time itself. Both science and the arts are in constant drive towards finding truth. In science, it traditionally takes the form of observing, hypothesizing, experimenting, analyzing, and peer review. In the arts, it is quite similar, taking the form of observe, wonder, create, edit, and display. Both fields are in search of the same thing and go about it similarly, so it is no wonder that throughout the history of the United States developments and movements within scientific fields especially those relating to already romanticized and poeticized fields like agriculture, forestry, and wildlife conservation take place, in part, through the arts.

The authors and the works that are investigated here are credited with leading these movements that promoted research, public support, and creation of organizations dedicated to the niche topics of Biology that agriculture, forestry, and wildlife conservation include. By researching these strides that literature has provided to the biological sciences, it may be possible to promote similar literature surrounding niche fields of Chemistry, Geography, Engineering, Physics, and astronomy. There is undoubtedly subject matter for literature in these fields as many of the professionals who work in them dedicate 7+ years of their lives simply for the degrees and background information to begin dedicating their life to work in these fields and niches.

## **Methods**

The Methods used in this research included literary reviews of over a dozen literary and scientific figures. They include the private letters of Thomas Jefferson, *The American Forests* and *God's First Temples* by John Muir, *The Ohio*, *Louisville in Kentucky*, *The Eccentric Naturalist*, *Scipio and the Bear*, and *Niagara*, by J.J. Audobon, *Walden* by Henry David Thoreau, *Pilgrim at Tinker Creek* by Annie Dillard, *As You Like It* by William Shakespeare, *The Everglades: A River of Grass*, By Marjory Stoneman Douglas, poetry by Phillip Freneau and student works in prominent Maryland forestry schools. These names and titles are not the entire scope of the research but just a known sampling of representatives of the periods discussed.

The methods used also included a review of the history of environmentalism in the United States and a gathering of other influential figures whose works are not directly quoted but are worth mentioning due to their influence on U.S. Forestry, Conservation, and Agriculture. The timeline information is mostly gathered from Greenpeace International, which offers a historical summary that goes beyond just the last 70 years of environmental history and even past the Bronze Age. Also, research was conducted into modern and historic world influencers in

Environmentalism. The two greatest being Steve Irwin, whose professional life influenced many modern Americans and people around the world, and Lady Cavendish the grandmother of science fiction and first female member of the Royal Philosophers Society.

Many of these authors were chosen specifically because of their work outside writing which includes funding expeditions, founding organizations, promoting the establishment of national parks, and their influence in the world. There are also several unknown authors that were chosen, who were published only within the last twelve years. Many of these works are less influential but show the opportunity for creative writing in the natural sciences being taken by undergraduates in the modern day.

## Results

The findings of the literary and historical reviews found that following the popularity or influential period of one of the authors or their works something significant happened. This significant thing was usually materialized as direct promotion of understanding in the natural world especially agriculture, forestry, and wildlife conservation. The most influential period being the late 19<sup>th</sup> Century into the early 20<sup>th</sup> Century. This period, being the “Progressive” Era, saw rise to many of the influential organizations and agencies that protect and serve the natural world today. There is also a large influential period going on now in the early 21<sup>st</sup> century, the likeness of which is difficult to separate as it is still a growing movement that changes near constantly.

There has been a long discussion and debate about the use of creative writing in the sciences for centuries. While it is debatable when it officially began, it officially hit the level of academic interest with the career of Lady Margaret Cavendish author of *The Blazing World*

which is the earliest predecessor of the science fiction genre and is considered the reason she was asked to join the Royal Philosopher's Society.

### **Pre-18<sup>th</sup> Century Writing**

The United States is not an “old” society with only 246 years of age in 2022. Even though the Native American's and the physical geography have been around for countless millennia, what we refer to the United States has only existed for less than three centuries. Therefore, many of the movements and idea's that the United States holds dear originated from places and events of the more distant past, including the use of creative writing to be used in the sciences.

A little over a century after Martin Luther argued that religious texts (namely the Bible) should be written in the language of the common people a woman with no formal education argued the same thing about the sciences. Lady Margaret Cavendish, Dutchess of Newcastle or as she was more commonly known “Mad Madge,” is best known for her work *The Blazing World* (1666), which came out a little more than 45 years after the pilgrims landed at Plymouth Rock. She would join what is considered one of the oldest “scientific” organizations in the world that predates the term *scientist* itself, *The Royal Philosopher's Society*. One notable member includes Robert Hook who developed the theories of cells and elasticity. Cavendish became a member because of her writings which dealt with themes such as experimentation and observation, art versus nature, and senses verses reason. Upon becoming a member, she would regularly join in debates from the perspective of an outsider to natural philosophy (the predecessor of what we call science) though she also made observations and theories of her own.

Famously Cavendish entered the debate of how scientific studies and theories should be written, especially advocating for the use of common languages such as English rather than Latin for papers. As Dr. Emily Wilkins, a researcher specializing in Cavendish's works and influences states this "Her own works (all of which were written in English rather than Latin) would be widely understood... she argued that her aim was 'to find out a Truth, at least a Probability in Natural Philosophy'" (Wilkins, 2014). In other words, she wanted to ensure that if truth, or knowledge were to be understood then they must be able to be understood by more than just the central community. More than just Cavendish's influences on how discoveries should be written would impact the natural sciences, but there would also be the need to have a love for nature.

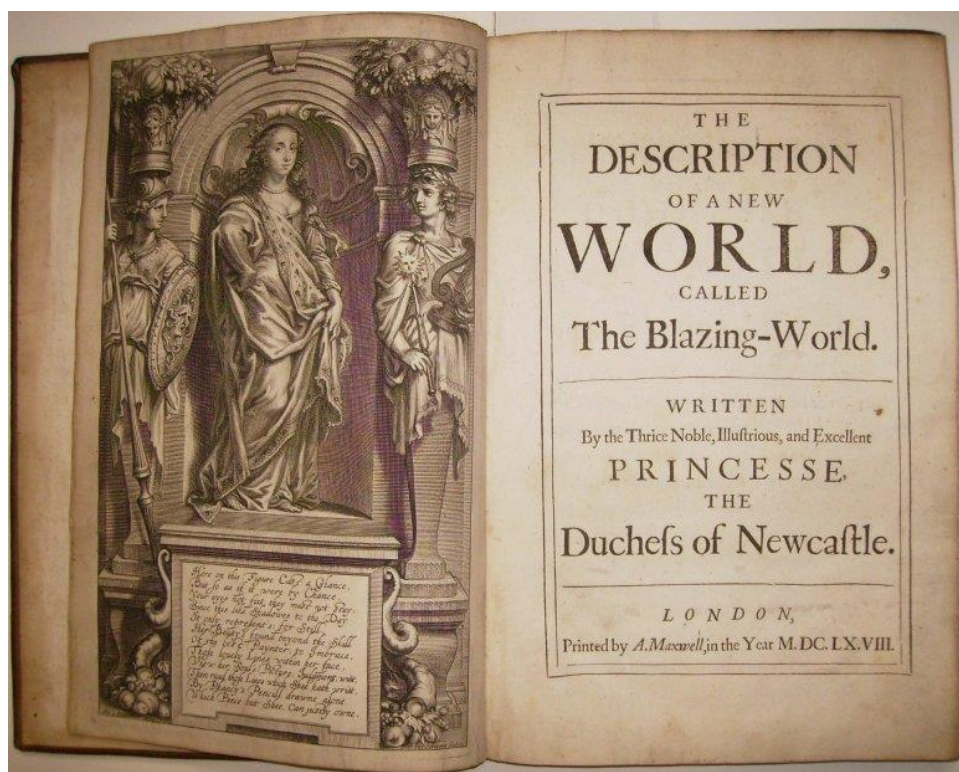


Figure 1. Cover art and title page of *The Blazing World* by Lady Cavendish

There are many influential figures who fell in love with the natural world but there are few as well read or as widely known as William Shakespeare. One of Shakespeare's most widely



quoted plays *As You Like It* which has quotable moments like “All the world is a stage” and “Much virtue in *if*” (Shakespeare, 1599) Shakespeare also makes a pre-romantic notion that truth and fair living are found in the forest. In a rather Robin Hood-esque portrait and much unlike the preceding fairy tale depictions of dark forests, the duke of the region is exiled into the forest with a close-knit band of loyal members of his court. When we are introduced to Duke Senior he tells the audience, and his band of fellows this:

Hath not old custom made this life more sweet Than that of painted pomp? Are not these woods More free from peril than the envious court? Here feel we not the penalty of Adam, The seasons' difference, as the icy fang And churlish chiding of the winter's wind, Which when it bites and blows upon my body Even till I shrink with cold, I smile and say “This is no flattery. These are counselors That feelingly persuade me what I am. Sweet are the uses of adversity, Which, like the toad, ugly and venomous, Wears yet a precious jewel in his head. And this our life, exempt from public haunt, Finds tongues in trees, books in the running brooks, Sermons in stones, and good in everything

The duke lives in the forests and streams of his former kingdom and is happier here than among his close councilors of the royal seated court. This influential mark of finding yourself in the world of nature rather than the world of men inspired and promoted even if only passively the movements of the future guiding increased people to the trees. This underlying argument is that unlike a society which paints pictures of lies, the forest is honest or true and to pursue truth is to be surrounded with nature and the elements.

These works that grew in popularity around the time of the landing at Plymouth Rock by the Pilgrims and the beginning of the English age of exploration. They were influencing the scientific world at a pivotal point in the history of the United States. Even though early American

literature shows a contest or battle with nature the pilgrim's comparison of themselves in the 1620's to the exodus into the wilderness during the times of Moses and Joshua does show the idea of deliverance or revealing of truth through exploring the natural world. They set the scene for appreciation of the natural world and sciences as the curtain for the origin of The United States was being drawn for the opening act.

### **18<sup>th</sup> Century Writing**

In the 18<sup>th</sup> century the influences from the past are reaped and new ones laid down, we also see the birth of the United States and the influence members of the founding had on the future of environmentalism in their more perfect union. The most prominent influencers were Robert B. Thomas, Thomas Jefferson, and Phillip Freneau.

Robert B. Thomas was also author of an important almanac during the 18<sup>th</sup> century. His exception to Benjamin Franklin's *Poor Richard's Almanac* and other prominent almanacs of the time was that instead of focusing on political/economical musings and country wisdom he also included weather predictions, crop sowing times, and information regarding animal husbandry. His almanac titled *The Old Farmer's Almanac* is still in print with new editions coming out every year and something easily found at most farm coop stores. Almanacs were growing in popularity as a genre of literature during the 18<sup>th</sup> century as evident by the rise in those who would emulate the almanac's own popularity. As put by David Jaffee in his study on Village Enlightenment literature he makes mention of "new mobile agents of republican popular culture were epitomized by peddlers of books and pamphlets" (Jaffee, 1990) or people who would make similar booklets to almanacs to try and get in on the hype. Robert Thomas' almanac was one of the first to target farmers' need for reliable information about the science of their crops and gardens for upcoming years. His ability to target this audience base came at just the right time as

the outcome of enlightenment movement (1640-1799) would encourage more scientific techniques to be introduced into traditional livelihoods. This is echoed by Jared van Wagenen Jr., who reviewed *The Old Farmer's Almanac* collection, states, "If the Farmer's Almanac in the beginning had been merely a calendar together with the phases of the moon and the Signs of the Zodiac interlarded with patent medicine advertising would have doubtless presently perished 'unwept, unhonored and unsung'" (van Wagenen, 1958). This adaptation, which fed into the desire for practical scientific methods among the U.S. population, has persisted for generations up to the point now, in 2023, *The Old Farmer's Almanac* has just published its two hundred and twenty first edition. The eighteenth century is not just about almanacs; however, it also includes some of the first notions of romantic elements directed at the American wilderness.

Phillip Freneau is best known as one of the United States' earliest poets, being best known during and just after the time of this country's founding. Nature writing or environmental literature would not take off as its own genre for another thirty to fifty years after The War for Independence in the literary movement of Romanticism which was kickstarted in England in the 1790's by authors like William Wordsworth and Mary Wollstonecraft and not in America's until 1820. Despite this and still being caught in the late enlightenment movement that focused more on empiricism rather than beauty, Freneau authors poems like *The Wild Honeysuckle*, which paints the natural world with bright and colorful language and art. In this poem, the speaker is mesmerized by the beauty of the honeysuckle flowers and the habitat they grow in (alongside a shallow stream in the shade of a forest) and is anguished at the thought of the flowers disappearing by Autumn. He then ends the poem announcing that the temporary expression of joy is precisely what the idea of a flower is "From morning suns and evening dews/ At first thy little being came: /If nothing once, you nothing lose, /For when you die you are

the same; /The space between is but an hour, /The mere idea of a flower” (Freneau, 1784).

Phillip Freneau certainly charmed and made the beauty of nature in the American fauna a muse for future authors and artists, but during this age of late empiricism it is authors and philosophers like Thomas Jefferson who maintained the theme of the age.

Thomas Jefferson being one of the most widely versed of the founding fathers in trade dabbled but never deeply committed to any one thing other than agriculture, even during his time as president he often spoke of his gardens at Monticello. In one letter to William Hamilton during his fifth year as president (first year of his second term) he speaks of his plans to plant a stand of various mimosa trees, mulberries, and scotch broom. He even speaks of his plans to gather the before mentioned trees when he returns to Virginia once he gets the opportunity to leave Washington “For this reason it is that I have put off to the fall of the year after next the collection of such curious trees” (Jefferson, 1806). However, prior to his time as President, Jefferson was obsessed with the native flora and fauna of Virginia and the rest of the young country. This includes his collection of native shrubbery and fruits, and his organization of an unofficial international society for the observance and expansion of plant life. This organization is one of the reasons of how new crops of rice started in the American south that he had shipped from contacts in Timor (Jefferson, 1790b) and how Pumpkin Squash made its way to the new world even becoming a delicacy on the presidents table (Jefferson, 1806). The thought of an organization spreading seeds of plants to non-native lands sounds horrifying today but Jefferson and his society used their international contacts to try and grow economies with more effective species of fruit and vegetable (Jefferson, 1806), without the full knowledge of the potential dangers of introducing new species to closed eco-systems.

Through these letters, it is observable that people like Jefferson around the world, are in pursuit of truth, seeking an open forum to share ideas and observations. There are two letters, in fact, that emphasize this. The first one, entitled *The Crumbs of Science*, Jefferson writes to James Madison about his opinions of a botanical scientist named Dr. Ingenhouse (The discoverer of light's impact on photosynthesis) about how light and light sources might influence the growth habits of plant life.

You know also that Doctor Ingenhouse had discovered as he supposed, from experiment, that vegetation might be promoted by occasioning streams of the electrical fluid (light) to pass through a plant, and that other physicians had received and confirmed this theory. He now, however, retracts it, and finds by more decisive experiments, that the electrical fluid can neither forward nor retard vegetation... He hazards the opinion that *light* promotes vegetation. I have heretofore supposed from observation, that light affects the color of living bodies, whether vegetable or animal; but that either the one or the other receives *nutriment* from that fluid, must be permitted to be doubted of, till better confirmed by observation (Jefferson, 1788).

This is an important supposition as the theories of photosynthesis were just first being published around this time as well. It also shows Jefferson's commitment to the scientific method and healthy skepticism. While it is likely that Jefferson had access to these publications of scientific musings, the independent theorizing between minds is an interesting read and observance. The other letter that proves significant is titled *Whippoorwills and Strawberries* where Jefferson wrote to fellow gardening enthusiast and birder Maria Jefferson about the times of year that Whippoorwill's start their mating season and the relationship between the birds and the sweet pseudocarp (Jefferson, 1790a). This dialogue, while being preserved in the letters of the author of

the Declaration of Independence, is important. It is worthy of noting that there were obviously many more letters being sent and received by early American's all over the country and it is only because of this one individual's notoriety that these letters specifically are preserved and published. Jefferson also would write to authors of wildlife guides to propose his own comments and provide knowledge he himself acquired. In one such instance, he wrote to the author of the book *General Geography* by Horatio G. Spafford, as the author made the claim that potatoes are a native plant species found in the eastern United States. Jefferson refutes this claim sending his own interpretation of why potatoes could be found in the wilderness of the eastern U.S. which boils down to that Sir Walter Raleigh the British explorer and colonist probably stopped in Ireland on his way west towards the southern colonies and the potatoes became naturalized at some point within the 100 years between his travels and the founding of the U.S. (Jefferson, 1809). While Jefferson remains one of the more complex of the founding fathers it is sure of one thing, and that is that he was dedicated to the pursuit of truth in studies of the natural world. The example, of the 18th century through his letters, is an example of the movement from observation to hypothesizing to experimentation.

The late 18<sup>th</sup> century was a time when empiricism and the exploration of natural philosophy (what we now call the natural sciences) really took off, but also a time where the romanticized ideas of beauty and truth in the natural world first became prominent. These ideas and themes are what authors and thinkers of the 19<sup>th</sup> century run with in their works and experiments which will in turn propel us to where the United States is today. From the time of the founding the United States has harbored the inspiration and love of nature that has been nurtured for just over two centuries to where we are now.

### **19<sup>th</sup> Century Writing**

The 19<sup>th</sup> century started where the 18<sup>th</sup> ended; with the feeling of overwhelming empiricism and not as much expression of emotion or beauty. The 19<sup>th</sup> century in literature and culture decided that things did not have to have all the color and life drained out of it to be real and truthful. In fact, the initial movement of Romanticism is based on the idea that the beautiful can be equated with the truthful. It is in this century that the authors Henry David Thoreau, John J. Audobon, and John Muir rose and grew in popularity resulting in several movements. This is also where the work of these authors.

As mentioned, Jefferson was influential in promoting exploration and a culture of appreciation for the natural world at the country's founding. This culture promised an audience for the author of *Civil Disobedience* and *Walden*. Thoreau was a promoter of the ideas of liberty and life is best when lived simply, surrounded by nature and by the work of your own brow. In *Walden*, these topics are discussed along with other themes including economics, the search for truth, and the virtue of solitude. Thoreau when identifying the need people of the United States have for the wilderness he says

We need the tonic of wildness...At the same time that we are earnest to explore and learn all things, we require that all things be mysterious and unexplorable, that land and sea be indefinitely wild, unsurveyed and unfathomed by us because unfathomable. We can never have enough of nature (*Walden*, 1854).

He claims we need the wilderness and to be able to explore it, but we need it to always be something to explore, something always unknown. His zest for the exploration of the outdoors and to grow closer to it was felt by others in this century including the likes of America's favorite ornithologist.



Figure 2 *Walden Woods* by Preston Gibbons

John J. Audobon would explore the freshly pioneered American landscape along the Mississippi River, into the Kentucky and Ohio region and all-around Appalachia, observing the species of flora and fauna he found there, especially the birds. His fascination with animals led to even greater popularity among the growing scientific community and naturalists who he would sometimes make fun of, especially in his work *The Eccentric Naturalist*, where he recalls a visit from an apparent half-crazed herbal naturalist, who has tracked him down to his home to see one of Audobon's famous prints (see Figures 1-2), where Audobon portrayed a species of plant the naturalist had not seen before and wanted to find it (Audobon, 1831e). His studies did not just focus on Birds and species of herbs however, as he discusses various observations of a plethora of American fauna in his writings including *Scipio and the Bear* where he goes on a bear hunt with a friend of his who recently had several bears cause damage to his corn fields. He also observes Black Bear habits and argues against presuppositions of that eastern bear species especially the use of tree scratches.





Figure 3. Draft of *Scipio and the Bear* by J.J. Audobon

He also through his travels was able to observe incredible landscapes and formations including Niagara Falls; where he writes an essay by the same title as the waterfall and tells his readers that “should you not have seen them, and are fond of contemplating the more magnificent of the creators works, go to Niagara, reader; for all the pictures you may see, all the descriptions you may read, of these mighty falls, can only produce a faint glimmer of a glowworm compared with the overpowering glory of the meridian sun” (Audobon, 1831a). The Audobon Society has from its inception at the turn of the 20<sup>th</sup> century focused on the observation and preservation of bird species in the United States with a grass roots approach that carries on to this day (2022). His love and observations of the American wilderness was the inspiration for the Audobon Society’s formation.



Figure 4. “American Sparrow Hawk” by John J. Audobon.



Figure 5. “Baltimore Oriole” by John J. Audobon

The protection of species and the acknowledgement of the role that animals and the forests play in our daily lives was a major theme in the 19<sup>th</sup> century. It would be impossible to talk of the protection of forests and not mention John Muir, the man who moved presidents. John Muir famously wrote about the Sierra's in his essay titled *Sierra's*, and that range would become personally important to him as he founds the Sierra Club and becomes its first president. He also wrote about the forests and the direction of environmental protection in the United States especially in the essay *God's first temples: How should we protect our forests* where he calls for government intervention in the logging and agricultural industries. His works along with the actions of Gifford Pinchot would lead the United States' environmental front in what is now referred to as “the progressive era” especially under the Theodore Roosevelt and the Woodrow Wilson administrations. In *Gods First Temples*, Muir argues for the preservation of forests because of their value to entire ecosystems saying “The practical importance of the preservation of our forests is augmented by their relations to climate, soils, and streams. Strip off the woods with their underbrush from the mountain flanks, and the whole state... would gradually change into a desert” (Muir, 1876). Muir had a great love for America's forests and would spend a generous portion of his life in them and encouraging others to spend time in them also. The

forests that he took most esteem in were the ones of the ancient giant Sequoia (*Sequoiadendron giganteum*). His love of forests is best observed today in his work *The American Forests*, where he introduces the reader to the essay with this opening sentence “The forests of America, however slighted by man, must have been a great delight to God; for they were the best he ever planted” (Muir, 1897). His attitude about how forests should be preserved and protected were however, different from what the newly founded U.S. Forest Service would adopt which was a policy that Gifford Pinchot himself prescribed which was change through education and discussion, not through force or regulation.

Gifford Pinchot himself was a heavily diversified individual whose life and work established forestry in the United States in the late 19<sup>th</sup> century and early 20<sup>th</sup> century. He studied meteorology at Yale before traveling to France to gain education in a growing field of silviculture. After that he worked as a private forester managing landscapes and private forests in the American Eastern region before returning to Yale and creating the first school of Forestry. To the first graduating class of the early 1910s, he gave the new foresters eleven maxims to be successful individuals and foresters. The fourth and fifth specifically speak to the value of creative thought and writing. The fourth saying “Find out in advance what the public will stand for. If it is right and they won’t stand for it, postpone action and educate them” (USDA, 2023) and the fifth saying, “Use the press first, last, and all the time if you want to reach the public” (USDA, 2023). Both maxims emphasize the value of public support, writing or at least proper communication to the public, and education being fundamentally necessary. Pinchot would write the first forestry textbook, *A Primer of Forestry*, and would also become the first Chief Forester of the US Forest Service and two-term governor of Pennsylvania. His writings, speeches, and political life would spark a note of controversy and lead to the national and still ongoing

discussion of Preservation verses Conservation. Preservation being the aim of John Muir and his Sierra Club sought to prevent any change from occurring on Nation Park property and the American wilderness. Conservation was the aim of Pinchot and his foresters who believed management and restricted industry on National Forest property would prevent permanent damage on private property and allow adaptability to occur within the national forests. This debate and the benefits of both have remained in ongoing discussions, but both objectives have been working hand in hand for a hundred years and could explain why many National Parks are surrounded by National Forests.



Figure 6, “Forest Hall, Pennsylvania” (home of the first forestry classes) by U.S. Forest Service

As previously mentioned, Gifford Pinchot founded the first school of forestry in the United States at his alma mater Yale school of the environment. Due to the unprecedented nature of forestry being a subject of higher education, Pinchot was also the author of the first textbook that his school of Forestry used. Titled *A Primer of Forestry*, Pinchot writes this textbook like a personal conversation. He uses this book to manifest the importance of forests and proper management of them. In the opening paragraphs he writes this

The old fairy tales which spoke of it as a terrible place are wrong. No one can really know the forest without feeling the gentle influence of one of the kindest and strongest parts of nature. from every point of view, it is one of the most helpful friends of man. Perhaps no other natural agent has done so much for the human race and has been so recklessly used and so little understood (Pinchot, 1899)

Pinchot makes clear points throughout this text and through his lifelong dedication to America's forests. The sincerest were that what we were doing was wrong, our ideas of what a forest was was also without founding and that needed to change. It was through his education and political leadership efforts that led to the conservation ideas held today.

This centuries growth of the human relationship with nature grew exponentially changing from the era of the enlightenment's empirical curiosity and turned into love, then respect, and culminating in the beginning of the 20<sup>th</sup> century with efforts of environmental protection. This would be a defining theme for the 20<sup>th</sup> century as many works that brought attention to wildlife sought to do so because of a desire for public action.

## **20<sup>th</sup> Century Writing**

In the 20<sup>th</sup> century, especially after the progressive era and the world wars, the world of literature saw massive changes. This is included in the United States' movements of civil rights writing and post-modern literature. These were caused because of traumatic events like the Jim Crow post-reconstruction, the Second World War and the procession into the Cold War and McCarthyism. For writing about the environment there was a clear overlap in both movements.

Marjory Stoneman Douglas is the best-known environmental writer of the 20<sup>th</sup> century. Her work *The Everglades: A River of Grass* is credited with being the work that turned the

Florida Everglades into a National Park and protecting the waterways which prior to her protests and writings were being diverted by the Army Corp of Engineers to provide city water sources across the state at the expense of the unique habitat that Ms. Douglas fell in love with. She paints beautiful pictures with her words of what the everglades are and always have been. In one such description early on in her book she says, "Nothing anywhere else is like them: Their vast glittering openness, wider than the enormous visible round of the horizon, the racing free saltiness and sweetness of their massive winds, under the dazzling blue heights of space" (Douglas, 1997). Douglas' magical descriptions of the everglades were one of the many reasons why her book cannot simply be put down. Her use of language to paint the picture of the uniqueness of the everglades helped to prompt individuals, organizations, and government to act on behalf of the wildlife that once had been sought to be destroyed.

On other side of the late 20<sup>th</sup> century writing there were/are authors like Annie Dillard that includes the opposition to reason which is a common theme in Post Modernism. In her novel *A pilgrim at Tinker Creek*, she makes several observations about nature in the area of Tinker Creek near her home including how clever predation in the animal kingdom can astonish those who observe the world around them. This follows the Post-Modern writing technique that not everything is what it seems, it is usually more dangerous than it first appears. Her encounter is with a giant water bug (*Lethocerus americanus*) and is as follows I noticed a small green frog... I crept closer... staring at the frog in the creek just four feet away. He was a very small frog... And just as I looked at him, he slowly crumpled and began to sag. The spirit vanished from his eyes as if snuffed. His skin emptied and drooped... He was shrinking before my eyes... An oval shadow hung in the water behind the drained frog" (Dillard, 1974). Mrs. Dillard would go on to earn the Pulitzer Prize for her work and continues to teach to this day.

While it is true that most American's are more familiar with homegrown native authors, there are several from across the sea that are considered classics and are favorites by American audiences. This category includes the works of J.R.R. Tolkien, a famous British novelist and while not precisely an environmentalist or naturalist he did express the importance of forests in his series *The Lord of the Rings* especially in the second book of the trilogy *The Two Towers* with the influential character Treebeard. While there are many theories surrounding the importance and the inspiration of treebeard within the novel one thing is certain, he is the honest voice of the forest speaking to a world industrializing at the expense of the trees. As one of the antagonists who seeks to build an army, he cuts down the forests under the protection of Treebeard and his fellows, the others in the legendary species of Ent. This unfolds with a final march and destruction of the army being built but it also illustrates the potential damage a world whose only focus is industry might cause to both sides of the agenda. The battle is emotionally and suspensefully driven as Tolkien writes the necessity of it for the tree herders who are the speakers of Tolkien's forest were because "our lives are in danger... the wanton hewing, the bad excuse of feeding fires, and the treachery of a neighbor, who should have helped us" (Tolkien, 1954). Tolkien's characters also speak about why people should act and even take risks for what they believe, in this case saving what is left of the forests. The leader of the Ent's heading to battle, Treebeard, says this "It is likely enough, my friends... that we are going to our doom... but if we stayed home and did nothing, doom would find us anyway, sooner or later" (Tolkien, 1954). The message that Tolkien delivers through these characters is that while you could simply ignore a situation, like the destruction of the environment, however, the situation will not ignore you.



The movements in the 20<sup>th</sup> century point the world of environmental literature in the direction of action and appreciation. This is important as mediums, including television, are also being broken into, especially with children's movies and shows including the 20<sup>th</sup> century movie and Dr. Suess book *The Lorax* which was banned in many schools and public areas for being considered anti-logging. The pushback and the rejection in many cases of environmental literature in the 20<sup>th</sup> century did not stop the creation and expression of authors and creators including one of the most influential figures of the late 20<sup>th</sup> and early 21<sup>st</sup> century.

## **21<sup>st</sup> Century and today**

The 21st century is young and is, in part, a culmination of 20th century literature movements. It is possible to speculate that we are currently in a new literary movement as literature and art movements tend to emerge following traumatic events for a country (Reconstruction and the Civil War, Modernism and WW1, Post-modernism, and WW2) and there is no doubt that the events of 9/11 and the war on terror changed the United States soul. While it is uncertain what the current movement will be defined by it is important to recognize the work that has happened and that is prospective to come.

There may be some research bias here, but Steve Irwin was the best and still is the most influential environmentalist in the world for the last 30 years. The Australia Zoo and Steve Irwin's international influence, especially with their ventures in creative media - like shows including "The Crocodile Hunter" and "It's the Irwin's." Both media ventures, as well as various interviews, blogs, and outlets done by the Irwin family and the Australia zoo have raised global awareness to environmental concerns and conservation efforts and research (Australia Zoo,

2022). This promotes global environmental awareness and shows how people can get involved in conservation efforts around the world. It has also provided international support for the Australian wildlife and the Australia Zoo but also local environmental awareness through the depictions of genuine love of wildlife and the outdoors that influenced so many individuals who either grew up or tuned in with the shows during the late 20<sup>th</sup> and early 21<sup>st</sup> century.

This passion and influence that the natural world has over writers in the 21<sup>st</sup> Century could be viewed either as the most obvious or least likely occurrence today. The daily role that the environment plays in our lives is dramatically less than what it was in the pre-19<sup>th</sup> century world. Many more individuals do not have to run through nature when nature calls through improvements in plumbing, urban sprawl decreased the amount of wild and forested areas, and you do not have to let your daily transportation graze or have regular Ferrier appointments (though it may be cheaper than gasoline and new tires). However, because many more individuals do not have to fight or struggle against the environment daily, it gives greater opportunity to romanticize what is being lost and what would have caused more hazards in daily life. While it is impossible to know the direction that literature and culture will take relating to the environment there are many up and coming writers who could provide a sneak peek into the future of creative writing and literary influence.

One way to pool these up-and-comers is through undergraduate publications where these individuals who are attending college or university test their writing skills. There are many of these journals across the country, however there are two that stand out for the State of Maryland. Firstly, is *Bittersweet* the Frostburg State University (FSU) journal. FSU being the only four-year university in the University of Maryland Systems to offer a Forestry minor and year-round forestry education, and secondly, Allegany College of Maryland's *Expressions* Allegany College

of Maryland is a two-year college in Western Maryland and their Forestry program boasts one of the highest employment rates upon graduation than any other forestry program in the state.

Starting with *Bittersweet*, this creative writing magazine holds many short stories and poems which draw inspirations from nature. Instead of the subject matter, however, editing is the important part of this magazine for creative writing around the natural sciences and wildlife. The magazine is student operated and many of the student staffers and editors have made submissions of their own which are by their nature environmental. Their influence and promotion of student writers in this magazine are important as based on consistent submissions which promote talented nature writers. Upon interviewing one of the editors, the editor was able to identify three to five FSU students who are identified by the editor as strong nature writers and promoted their works in and outside of the magazine.

Moving into *Expressions*, this magazine is also a collection of poetry, art, and short stories, but also it contains strong research essays and persuasive writing assignments. This is important for ACM because of their Forestry program. Due to the opportunity to publish persuasive writing or forestry research is an important opportunity for future foresters especially when forestry work includes being able to write to land managers, grant funders, and natural resource campaigners. One such work, published in 2020, was written by Mark Turgeon and showed ways for landowners and managers to promote deer movements on their land using native trees and simple forestry techniques (Turgeon, 2020). The use of creative writing and essays to promote the uses of proper forestry techniques that benefit the natural world to private landowners is an exciting potential genre of creative nonfiction. The opportunity for up-and-coming forestry technicians and managers to exercise these skills is also most valuable so that they can exercise their communication skills of which Gifford Pinchot emphasized so heavily.

## Discussion

Throughout the literature review, there have been several things that became evident. Firstly, there is a long history of creative writing and the sciences relating to the natural world. Secondly, there is a prominent effect that these writings have had on the way agriculture, forestry, and conservation are managed. Then thirdly, there are clues that the use of creative writing becomes more important as time goes forward and is a trend that is expected to continue in the future. These three observations lead to several directions that the scientific community and natural resource protection can use to their benefit in the future.

These writings that effected the United States began even before the United States proper was formed. The works of Margaret Cavendish, William Shakespeare and their contemporaries would set the stage at this initiation for the North American continent becoming a melting pot of culture and ideas especially western and occidental philosophy. The 18<sup>th</sup> century saw the works of the Enlightenment and the beginning of the era of Romanticism giving readers the first poems of the American wilderness through Phillip Freneau. The 18<sup>th</sup> and 19<sup>th</sup> century developed the era of Romanticism and the influence of Thomas Jefferson. The 19<sup>th</sup> century also saw the rise of the founding fathers of Naturalist writing Henry David Thoreau, J.J. Audobon, Gifford Pinchot and John Muir whose works brought the United States into the era of Progressivism that birthed the various government protection and research agencies that are still alive today. The writings and influence of the 19<sup>th</sup> century and progressive era then gave rise to an era of activism which turned the goal of creative writing to sway the minds of the American people to support their causes. Thus was the writing of Margory S. Douglas and Annie Dillard. The 21<sup>st</sup> century is still ongoing and is an age quite unlike the times that came before it but multimedia works like those of the Irwin family and the student works that highlight the next generation of publishers and

writers paint a brighter future for the market of creative writing in the natural sciences, or at least the ones pertaining to the trees and wildlife.

Creative non-fiction writing and persuasive writing are not forms of writing that seem linked to the natural sciences, however, as seen through this research they are linked to the successes of each of the industries and movements that have occurred in the United States relating to them. Most writing that is required to be taught is report writing, observation writing, and persuasive writing as it relates to management plans. These requirements are important, and they serve valuable purposes, but right now if someone is writing a creative or persuasive paper for their college degree for their classes in most of the science departments within the University of Maryland Systems, it is at the discretion of the professor, not as an academic requirement. Despite this, the people of this day and age are in an era where there is so much information, more than what could be read in multiple lifetimes, it is important that if you have a message, it not only has to be able to be read or available to be read, but it must be written in a way that people will want to read. It is important also to distinguish the power of a well written creative essay and a memorable or frightening headline, which serves no purpose for the pursuit of truth except maybe to catch short term attention. While there are many people who enjoy reading non-fiction surrounding the sciences, there are significantly more people who enjoy reading narratives and dialogues, thus making creative writing a valuable tool for spreading messages and information. Persuasive writing is also of immense importance as it is only through persuasion that endorsements for research can be granted, that preferred methods of land and animal management could gain in popularity, and that any other kind of action can take place.

There are more needs now for public awareness and the retention of awareness in developments in the scientific community surrounding natural and agricultural resources. In this

new age, most of the readily available information about current developments is through news media and journalism. While these fields of writing are impressive in their ability to reach wide ranges of audiences, they are often short, inaccurate of the real image, and in such high volume that it is near impossible for them to be considered the best kind of writing available for scientific information, which prides itself on its empirical reliability especially if a response of meaningful action is to take place on behalf or through the audience. It is more important now to promote writing that can endure initial hype, is accurate, and can be readily accessed for broad audiences. Books or journals about experiences, rhetorical arguments and musings about management options, and novelizations of species, individuals, and formations are the best hope for a rededication to written truth surrounding the natural sciences that can bring in greater public interest, empathy, and involvement to the world of natural resources.

As the 20<sup>th</sup> century began with public and social movements that sought to petition and influence the government, the 21<sup>st</sup> century is beginning with what could be a desire to leave the government and make decisions as individuals as seen with the social response to issues during and post government mandated Covid-19 lockdowns. While this potential direction of movement would not harm the leaps and bounds of change that the last hundred years brought, it does make for an interesting predicament for movements in the environment and natural sciences. Rather than simply and directly approaching the government which would then convey the importance of the issue through public representatives and administrative officials crowdsourcing and crowdfunding for information and resources could become the way of the future.

One way that the crowdsourcing method of gathering scientific support in forestry and wildlife conservation is through the Maryland Biodiversity Project. This is a citizen science project that uses various sources including social media apps like iNaturalist to gather pictures

and geospatial information regarding the biotic life of the state of Maryland and surrounding area. This project aids researchers and scientists who need to know the native range and recent updates to the range of the various wildlife of the state of Maryland without having to individually conduct the field research themselves. It also gathers community involvement and involves many of the individuals and organizations within the state that wish to do nothing other than enjoy the outdoors of the Old-Line State. The success of this website is mentioned on the organizations main page where they mention that they have “cataloged more than 20,600 species, including nearly 13,000 species with photographs, and features the work of more than 18,000 naturalists and photographers” (MBP, 2023). It is possible that more or adaptations of this website could lead to greater scientific discovery and information regarding other natural sciences outside biology and its disciplinaries. For now, it is uncertain what the future holds in terms of scientific innovation and discovery, but current trends and the utilization of modern mediums are a good sign for progress.

## **Conclusion**

As seen throughout the research thus far, creative writing has an inherent benefit for developing, growing, and evolving the studies of agriculture, forestry, and wildlife conservation. While it is not required to learn the writing or communication skills that promote public interest in these fields, the overall fitness or preserved longevity of these fields is determined by the ability of its members to share ideas creatively and persuasively. Nothing survives or adapts without the allocation of resources or energy to do a particular job or to evolve in a certain way. So, like a tree may evolve to have lobed or entire leaf margins, or a *Panthera* species developing spots or stripes, so too much the scientific community develop adaptations to existing traits that

promote education in creative writing and persuasive language if it is to endure in the modern information age.

Therefore, Colleges and Universities within Maryland whose departments of Natural Sciences value the ability of their students to become more competitive and successful in being able to communicate their ideas and observations should evaluate their current curriculum. Each department should ensure that there are classes or opportunities for students to learn how to communicate their ideas to a general audience with general comprehension. Each student should not just be capable of understanding their field through and through but also how to communicate the value, beauty, and future outcomes that come from careers and actions within their respective fields. Thereby increasing the ability of STEM professionals to succeed in grant writing, crowdfunding, educating, and garnishing public interest in their work. This action would thereby create a world of STEM that makes the individuals and works found in this research the rule and no longer the exception.

This research concludes with acknowledging the necessity of existing scientific and STEM communication through various mediums including journalism, reports, observation notes, and even picture recordings. Each communication format serves a unique and deliberate purpose. Despite these mediums this research finds that the most influential works to environmental movements and gaining public support for actions in the fields of Forestry, Agriculture, and Wildlife Conservation were not just reports but creative and even poetic works of fiction and non-fiction. Therefore, works that inspire and can communicate to wide audiences are vital to the aims of movements within the natural sciences. As was argued four centuries ago scientific information should be made in a form that is digestible and readable to the common people, not simply by language but also in the medium and form of the writings.



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