



THIEL

C O L L E G E

THIEL COLLEGE RESEARCH SYMPOSIUM

SATURDAY

APRIL 12, 2014

JOHNSON CONFERENCE CENTER

THIEL COLLEGE CAMPUS

SYMPOSIUM SCHEDULE

8:30 AM Registration and posters set-up
Continental Breakfast, Foyer Area

9:00 am Welcome and Opening Remarks

9:10 am **Oral Presentations: Concurrent Sessions 1**
(Oral Abstracts listed in Symposium Bulletin by room and order of presentation)
Presenters give zip drives containing presentations to Moderator at beginning of session to load on the computer.

Room 101

9:10-9:30 Bess Onegow (HON)
The author god: a comparison of authorship and process theology

9:35-9:55 S.A. Dudics-Giagnocavo (BIO)
Occurrence of vcgC in clinical and environmental strains of *Vibrio vulnificus*

10:00-10:20 Jessica Slupe (HON)
History of mental health care in the United States military: Brought to Life

10:25-10:45 Sara Toombs (HON)
The modern feminist: A historical review and a contemporary initiative

Oral Presentations: Concurrent Sessions 1

Room 105

9:10-9:30 Keeley Criswell (HON)
Meandering the maze: societal impacts on women

9:35-9:55 Austin Hall (ENG)
Companion Poets: Blake and Hopkins

10:00-10:20 Cassandra Cook (HON)
Love and war: Thiel College Winterguard 2014

10:25-10:45 Timothy Hutton (HON)
The joining of the personified human spirit and animal action through shared behavior: a modern-day Aesop

10:50- 11:35 **Poster Session**
Presenters will be present by their posters for the duration of the session. Poster abstracts are listed by number in the Symposium Bulletin. Posters may be removed after the session

Oral Presentations: Concurrent Sessions 2

Room 101

11:40-12:00 Sean Oros (HON)
Teaching through Stories: The Role of Historical Fiction in Education

12:05-12:25 Shane Martin (HON)
Wind energy at Thiel College: thinking globally while acting locally

12:30-12:50 Colin Vitale
Thiel image reformation: potential solutions for the divisions between Thiel College and Greenville

Oral Presentations: Concurrent Sessions 2

Room 105

11:40-12:00 Ashley Johnson (ENG)
Romantic inspiration: the creative “spot”

12:05-12:25 Austin Hall (ENG)
Legalistic Liberators: The Works of Lincoln, Stanton, and Roosevelt

1:00 Closing Remarks

Oral Presentations Abstracts Concurrent Session #1

Room 101

The author god: a comparison of authorship and process theology

E. H. S. Onegow

D. Eppley, Ph.D., Professor of Religion; M. DelMaramo, Ph.D., Professor of English

Authorship gives the means of creating an entirely new reality built of words and concepts. This is a joyful and painstaking experience in which both the author and the story are mutually shaped. Just as an author takes part in the creation of a story, God takes part in the creation of reality. The influence and expression of God within a reality composed of moments of experience is comparable to the power an author holds over even the minutest details of a story. Albert Whitehead, a twentieth century philosopher and theologian, described a theology in which God is present within the world at the same time as being shaped by the world—process theology. In this presentation, I will compare the role of God within reality as described in process theology to the role of author in the reality of a story.

Occurrence of *vcgC* in clinical and environmental strains of *Vibrio vulnificus*

S.A. Dudics-Giagnocavo

G. W. Buck, Ph.D., Associate Professor of Biology; S. J. Swerdlow, Ph.D., Biology Assistant Professor

The bacterium *Vibrio vulnificus* is a halophilic pathogen that can cause necrotizing fasciitis and food-borne illnesses including gastroenteritis. Biotype 1 strains of *V. vulnificus* have shown dimorphism in the *vcg* locus (*vcgC* and *vcgE*) that provide correlation between *vcg* alleles and clinical and environmental isolates. In this study, the virulence coding gene (*vcg*) locus was amplified in 42 strains of *V. vulnificus* using endpoint polymerase chain reaction (PCR) to observe differences between environmental and clinical strains in the *vcg* locus. This region may be a potential locus associated with pathogenicity and used for classification of *V. vulnificus* isolates. Primers were designed to amplify a 428 bp region using the genomic sequence of *V. vulnificus* strain 96-245 *vcgC* gene. *Vibrio* crude lysates were prepared and endpoint PCR was performed to amplify DNA and visualized by 1% agarose electrophoresis to detect the presence of the *vcgC* locus. Results show that all nine clinical and most environmental *V. vulnificus* isolates show an amplicon representing the *vcgC* locus. Future aims will involve improved primers for *vcg* to better discern the specific differences between *vcgC* and *vcgE*.

History of mental health care in the United States military: Brought to Life

J.R. Slupe

L. Pickens, Ph. D. Assistant Professor of Psychology; M. Adams, M.A. Adjunct Professor of History

Mental health care in the United States military has a fascinating and complex history. Over time, mental health care in the military has evolved into many different forms. This presentation investigates that history through detailed research from the Civil War to modern-day. This research is supplemented with personal interviews with active-duty members and veterans of the United States military from as long ago as World War II. All interviews were carried out either in-person or by telephone. These interviews provide a perspective that is unique to this presentation, by making connections between research literature and actual military experiences. The interviews serve to fill the gaps in the literature by exposing how real-life military members experienced the changing treatments, terminologies, and attitudes towards mental health care over time.

The modern feminist: A historical review and a contemporary initiative

S. D. Toombs

C. L. Sutton, Ph. D., Professor of Sociology

Despite the common belief the feminism is a movement of the past, the task of establishing legitimate equality is yet to be accomplished. In order to effectively move forward in any initiative, a comprehensive understanding of past efforts is fundamental. Therefore, this research includes an examination of the development of the feminist movement in America as well as a projected view of the future of women's rights efforts. The purpose of this project is to gain insight from feminism's past in order to provide insight for its progress. This research, which examines the three waves of American feminism, theoretical perspectives, and modern movements, provided the foundation for a contemporary initiative project entitled "Be The Girl." Be The Girl, a three-hour workshop for young women, was designed to deliver a practical example of the anticipated "new face" of feminism: one of individual empowerment, leadership, and responsibility.

Oral Presentations Abstracts Concurrent Session #1

Room 105

Meandering the maze: societal impacts on women

K. J. E. Criswell

C. S. Kreisel, Ph.D., Associate Professor of History; G. R. Jesse, D.Sc. , Associate Professor of E-Commerce and Web Design

Women face a barrage of propaganda and societal stigmas that are negative to their development. It all starts before these girls are born, and it affects them throughout their entire lives. Not only does it influence the beliefs of females, but it also influences males. Today, many people believe that women are considered equal with males – they believe that women have gained all that they can gain. However, women are still underrepresented in fields that are considered traditionally male, and they are underpaid in the positions that they share. As children, females tend to be confident and outgoing, similar to males. But, things begin to change when they enter school. The most rapid part of this change takes place during adolescence when growing individuals begin to experience major physical and psychological changes. It is during this time period when many women begin to lose the confidence that could keep them from perpetuating the stigmas that have already affected them.

Companion Poets: Blake and Hopkins

Austin Hall

M. T. Hall, Ph.D., Professor of English

Companion poets exhibit similar themes, writing styles and messages in their poetry. For these reasons, the Romantic Era poet William Blake and Victorian Age poet Gerard Manley Hopkins are companion poets. Blake's *Innocence* selections are comparable to Hopkins' nature poems because both exhibit the themes of youthful ignorance and happiness as displayed by Blake's "The Lamb" and Hopkins' "As Kingfishers Catch Fire." Contrastingly, Blake's *Experience* poems and Hopkins' "terrible sonnets" relate because of their shared theme of "Dark Night of the Soul," a term coined by St. John of the Cross which means being in the state of spiritual crisis, and the genre of spiritual autobiography, which, according to T. S. Eliot, is a recording of "the fluctuations of emotion between despair and bliss" (Hall 1). This is displayed in Blake's work "The Tyger" and in Hopkins' "I Wake and Feel the Fell of Dark, Not Day." The theme "Dark Night of the Soul" and the genre of spiritual autobiography are literary implements that are universal, not just for the religiously inclined. William Blake and Gerard Manley Hopkins are companion poets because of the correlating themes, the similar literary tropes, and analogous genres within their respective groups of poetry.

Love and war: Thiel College Winterguard 2014

C.M. Cook

A.S. Erb, Professor of Music; B. Parkinson, Ph.D., Professor of Psychology

Winterguard is a competitive indoor colorguard, which is about expression: expression of emotions and stories. In its second year at Thiel College, this team has grown to show the campus and the Three Rivers Winter Ensemble Association that everything they do is for the enjoyment of the audience and betterment of our school. Running this organization takes dedication and learning new skills in order to make all aspects of this organization come together. Performing in this organization also has connections in all fields, such as literature, science, math, and most importantly psychology. Performing in a musical ensemble is shown to increase overall grades, happiness, and moods of the performers. This presentation will further investigate and explain the inner workings and psychological effects of the Thiel College Winterguard 2014 season.

The joining of the personified human spirit and animal action through shared behavior: a modern-day Aesop

T. P. Hutton

M. J. DelMaramo, Ph.D., Professor of English; M. T. Balas, Ph.D., Professor of Biology and Department Chair

Throughout history, animals have been used as symbols in many ways, whether it is through the representation of historical figures, groups of people, emotions, personalities, family sigils, totems, or characteristics. A forefront for animal use in literature is found in *The Fables of Aesop*, which portrays animals in a variety of situations in order to teach a moral or lesson to the audience. Now with more knowledge and observations of these animals' behaviors in the wild, this information is an inspiration in literature and science that is still being utilized today, all while emphasizing the animals' portrayal and connection to human nature. These fables, written by Aesop in the sixth century B.C.E., portrayed life between the slaves and the elite class on the Greek island, Samos. Today, these animals still show up in modern literature, and they still acknowledge these same archetypes. Using some of these archetypes, along with scientific and biological observations, these animals can be used to teach morals to the current generation, as well as teaching animal behavior, ultimately showing that humans and animals share very common goals and behaviors in order to survive.

Oral Presentations Abstracts

Concurrent Session #2

Room 101

Teaching through Stories: The Role of Historical Fiction in Education

Sean Oros

David Buck, Ph.D., Professor of History; Mary Theresa Hall, Ph.D., Professor of English

This project explores the educational value of historical fiction, especially focusing on its dual role as history and literature. The study engages a number of critical sources on historical fiction, defining what historical fiction is, exploring a number of varieties thereof, and setting a rubric by which individual works may be judged for scholarly value. Three works will be examined as examples: for research-based historical fiction, *The Killer Angels*; for historical romance, *The Eagle of the Ninth*; for contemporary-turned-historical fiction, *The Jungle*. By examining and comparing all of these, the nature and value of historical fiction, both for enjoyment and education, can be explored.

Wind energy at Thiel College: thinking globally while acting locally

S.J. Martin

P.C. Hecking, Ph.D., Professor of Physics; M.T. Hall, Ph.D., Professor of English

The purpose of this Honors project is to propose how Thiel College, a small, rural institution in Greenville, Pennsylvania, can promote environmental awareness and how the College itself may benefit from having a renewable energy source, namely, wind power, on its campus. Through the installation of a wind turbine, Thiel College could possibly harness enough energy to reduce the dependency on the electric grid of one building, or different parts of buildings, on its campus. This work considers many theoretical factors, from the goal of alternative energies and the different types of alternative power available to the concepts of wind power and wind turbines and their positive and negative effects from environmental, economic, global, and collegiate perspectives. To this end, various experiments and investigations were performed, such as a visit to a local state park with a wind turbine, a survey of the College's electric bills and energy usage, and wind speed tests around campus, in order to explore the feasibility of installing a wind turbine on the campus of the College. While these investigations suggested an insignificant financial gain from a wind turbine on its campus, they also demonstrated many other ways that wind power would be a feasible and practical alternative energy source for the College. The turbine could act as a focal point to student and faculty research and serve as a demonstration of Thiel's commitment to a green environment.

Thiel image reformation: potential solutions for the divisions between Thiel College and Greenville

C. A. N. Vitale

B. Batchelor, Ph.D., James Pedas Professor of Communication; L. J. Moroco, Ph.D., Associate Professor of Communication

As a science of communication, Public Relations is a field designed to improve the public standing and image of companies, businesses, charities, and educational institutions which need either exposure or exaltation. Improving an institution's image—specifically after a mistake or unfavorable practice—is vital to the continued function of its parts. This presentation will serve as a mock-consultation and campaign pitch to Thiel's Public Relations department to address and resolve certain issues surrounding Thiel's public and digital reputation. With developing technologies and media, both social and print, giving the school more publicity than ever before, some less-than-positive information can and has been spread throughout Greenville and the hometowns of high school students. The pitch will address multiple spheres of concern such as prospective students, internal affairs, and community relationships. Problems dealing with Thiel's marred social media presentation, students' outcry in times of distress with their school, and unpleasant interactions between Greenville denizens and students and/or faculty will receive potential solutions. Communal programming, media sweeps, and improved stance on involvement and accountability are among the fixes for Thiel's vexations.

Oral Presentations Abstracts Concurrent Session #2

Room 105

Romantic inspiration: the creative "spot"

Ashley Johnson

M.T. Hall, Ph.D., Professor of English

Romantic authors experience enlightenment in the natural world, often focusing on singular elements as the inspiration and outlet for their creativity. Seemingly innocuous objects or places trigger strong bursts of emotion from Romantic authors, inspiring well-known and beloved poetry and prose. The "creative spot" appears repeatedly in the literature of first-generation Romantic authors William Wordsworth and Samuel Coleridge and second-generation author John Keats. William Wordsworth penned "Lines Written a Few Miles above Tintern Abbey" while hiking outdoors at a place to which he felt connected emotionally. His poem exhibits the creative manifestation of the emotions Wordsworth felt upon revisiting Tintern Abbey with his sister Dorothy. In this instance, Tintern Abbey serves as a catalyst for Wordsworth's feelings of hope and revitalization that are prominent throughout his poem.

Samuel Taylor Coleridge's poem "This Lime-Tree Bower My Prison" also displays this phenomenon. Coleridge utilizes the peace and comfort he finds within the shade of a lime tree after an accident to compose his poem as a form of bibliotherapy. He experiences a deep serenity underneath the lime tree that soothes the disappointment he felt at not being physically able to accompany his friends on a much-anticipated hike, and harnesses nature's calming essence to compose a cathartic piece of literature. Finally, John Keats' "Ode on a Grecian Urn" continues to display this theme of bibliotherapeutic natural inspiration in a similar sense. Whereas Wordsworth and Coleridge incorporate the abstract outside naturalistic world, Keats displays nature through a tangible artistic object, finding enlightenment in the paintings upon the surface of the urn and applying that insight to his creative verse. The "creative spot" serves as a key element in the composition of some of the Romantic Era's most cherished literary works.

Legalistic Liberators: The Works of Lincoln, Stanton, and Roosevelt

Austin Hall

M. T. Hall, Ph.D., Professor of English

Documents designed by leaders to liberate a group of people are most effective when drafted in "legalism." This style of argumentation was invented by the Ancient Greeks, specifically, Aristotle, and was taught to many of the students of the Ancient Greek educational system. From Aristotle's study on rhetorical argumentative stylistics, one can conclude that an effective rhetorician follows six key characteristics: persuades clearly, exudes reason, defends one's point, knows and debunks the opposition's topics, refutes fallacies, and chooses and executes his or her words carefully and purposefully. These features all follow legalism: a style of argumentation that consists of, "the ethical attitude that holds moral conduct to be a matter of rule following, and moral relationships to consist of, duties and rights determined by rules" (Shklar 1). This essentially means that legalism is a structured and methodical argument that includes morals and ethics. Effective legalism is thoroughly displayed in Abraham Lincoln's "Emancipation Proclamation," Elizabeth Cady Stanton's "Declaration of Rights and Sentiments," and Eleanor Roosevelt's "Universal Declaration of Human Rights." These three authors incorporate the theme of liberation, an ethically-driven action, into their respective works. Lincoln's work concentrates on emancipating the southern slaves during the United States Civil War, whereas Elizabeth Cady Stanton focusses on freeing women from gender discrimination. Finally, Eleanor Roosevelt centers her argument on the necessity of the equal rights of all humans. Through their incorporation of legalism, these authors successfully prove that effective leaders must exhibit fairness and equality toward all human beings.

Language as a complex and dynamic tool

M. E. Preston

N. A. Antonino, Lecturer and Program Coordinator of Communication Sciences & Disorders; J. S. Griffin, Professor of Psychology, Associate Academic Dean, Acting Department Chair of Education

The study of linguistics is a vastly broad topic that has provided new insights to the science behind language. Many famous researchers have contributed significant information to the field, influencing later studies concerning the shaping and development of human speech. Modern culture, particularly of the increasing speed of technological development, has had a noteworthy effect upon today's language. The eternally quickening pace of American lifestyles encourages change and calls for language to continue to be a malleable form of communication. The Communication Sciences & Disorders major allows students to learn the necessary tools to become a Speech Pathologist capable of interpreting this change. Among its many functions, Speech Pathology helps people who have difficulty with verbal communication. This presentation will explore the history of language while analyzing the culture of contemporary society and how language has been affected as well as demonstrate a mock consultation with a fictional patient in order to show the steps taken to ensure speech is a tool available to all.

Poster Presentation Abstracts

1. President Lazaro Cardenas

Ashley Adamson

David R. Buck, Ph.D., Associate Professor of History

Lazaro Cardenas, the president of Mexico from 1934 to 1940, was viewed as a man of the people. Many believed that Lazaro Cardenas would be a puppet president to Plutarco Calles, who helped get Cardenas elected. Cardenas would prove to not be easily manipulated, and in the first years of his term worked to remove Calles' power. By 1936 Cardenas had planned a coup to remove Calles and his closet supporters from the country. Events that Cardenas experienced before his presidency helped him lead his reforms during his term in office. Cardenas wanted to improve the lives of the poor in Mexico, leading to his many reforms. He had vowed while he campaigned for election that "there will be no one who can stop me until the peasant has received the best lands and the State has given him all financial, moral, and material aid possible." Cardenas would institute a large land reform, often giving away land to those who flocked around him while he traveled. By 1940 Lazaro Cardenas had distributed 17 million hectares, to almost 8,000 new villages. In his education reform Cardenas defined the constitutional rights and duties of teachers and students, stating children had the right to rise to a cultural level that they were capable of intellectually. Lazaro Cardenas other area that he instituted reforms was the unions. He created new unions, supporting both men and

women. He gained the support of the National United Front for Women's Rights when he created libraries, night schools, and health centers to better women's lives. When the Mexican Confederation of Workers began to strike against the U. S. and British corporations, Cardenas nationalized oil in Mexico, to help the union workers.

2. **Rafael Trujillo: a man uncovered**

Brittany Patten

David R. Buck, Ph.D., Associate Professor of History

This paper focuses on the life of Rafael Trujillo, from beginning to end. The objective of the paper was to describe both the good and bad choices that Trujillo, a dictator of the Dominican Republic, made throughout his rule. Through much research, through books, journals and primary sources, the story of Trujillo's life was found from lowly beginnings to a tragic end. This paper suggests that Trujillo, despite having been one of the most violent dictators in Latin America, had done many good things for the Dominican Republic, as well. Without the hard work and reform that Trujillo presented to the Dominican Republic, the hurricane that the country experienced would have been detrimental to any future production. Trujillo supplied the country with new infrastructure and policies, which, according to this research, made him a beloved figure in many ways. He also placed a high value on education, and improved the educational system for all in countless ways. However, Trujillo also conducted one of the most deplorable attacks on Haitian people in the past 100 years. He also attempted multiple times to kill off another dictator, Romulo Betancourt, but would never succeed. His actions were seen as unacceptable by the United States of America, and in 1961, Trujillo was assassinated. Rafael Trujillo's death has much speculation about it, including many theories that the US itself had promoted it and even provided guns to the assassins. With Trujillo's mysterious, tragic death comes a widely known conspiracy, which, in turn, makes him even more notorious than he was before. He, like most dictators, did both very good things and extremely evil things at the same time. This paper attempts to confer that Trujillo, while not a permanent threat, was equivalent to other dictators that the US took action against. Ultimately, Trujillo's reforms could not forgive the atrocities he committed.

3. **South African Apartheid**

Dalton Young

David R. Buck, Ph.D., Associate Professor of History

There have been many times in world history that people have thought of themselves as the superior. There was the issue of slavery in America, the issues of women not being able to speak for themselves and vote. These are just examples of cultural issues, there also have been mass genocides in many countries throughout the world that happened because one race thought they were superior and decided to try and eliminate them from the face of the planet. The South African apartheid was like one of these times. It was a time that most South Africans would not want to be affiliated with and would rather not talk about what happen. The Afrikaners made many regulations that made the society become anti- nonwhites and ultimately led to the world looking negatively towards South Africa for many years. The rise of the apartheid started with the rise of the Afrikaner party and ultimately lasted until their reign of terror came to an end.

4. **The Ottoman's failure to modernize and their demise: internal struggles**

Jordan Land

David R. Buck, Ph.D., Associate Professor of History

In my paper, I covered the reasons why the Ottoman Empire would have collapse even without involvement in World War I. The key reason foreshowing the Empire's coming demise was the Ottoman's failure to modernize. Modernization was swept under the table, because the groups and people in power wanted to hold on to their traditional power. These groups and people forgot or ignored that it was the modernization of the past that made them powerful in the first place. From holding on to the old ways of doing things the Ottoman Empire slowly lost its ability to adapt and change. Even after it tried to break free from the old ways, it was too little too late, and the empire was doomed to fall apart. Failure to modernize or reform the empire led to the rise of internal issues. Their economy, governmental administration, politics, and military, bent down because of the burden caused by the changing times of the late 19th and early 20th. This led to further problems, because it breeds unrest and civil discourse. The fall of the Ottoman Empire was guaranteed because it was unable to deal with the new problems caused by the modern age. With or without World War I the Ottoman's were on the fast track to destruction. The empire went from a roaring inferno of culture and influence to weak cinders by the end, thanks to the new world of the 20th century.

5. **Fidel Castro: rise to power and lasting effects on the Cuban economy**

Michael Finchio

David R. Buck, Ph.D., Associate Professor of History

This poster presentation covers Fidel Castro's rise to power and his lasting effects on the Cuban economy. Castro, throughout his youth, witnessed the injustices and corruption of the Cuban government under Fulgencio Batista. As he began law school at Havanna

University he experienced a student revolution against the government injustices. These rebellions were put down with force from the police which caused resentment in the society, as well as Castro. After being imprisoned for 6 years for revolutionary activities, he would run for candidacy for an anti-corruption orthodox party. The election was staged by Batista causing even more resentment and eventually armed struggle against the government. July 26th 1953, marks the inauguration of attacks against Batista. Castro led an unsuccessful attempt to overthrow Batista's forces at the Moncada Garrison and was imprisoned once again. Upon his court date and sentencing he proclaimed the famous words, "Convict me! History will absolve me." His manifesto, including those words, was smuggled out to the public. After being released and assuming power, Castro would devise and implement many reforms in an attempt to help Cuba's ailing economy. Problems with the sugar economy and its dependency on other countries put Cuba in a bad position. His reforms included: health care, education, and housing for the poor. He also helped by starting programs to build up infrastructure. His most successful reform would be that of education, but health care would be effective as well. The country now experiences a 99.8 percent literacy rate as well as a 15 year rise in life expectancy. However, some of his reforms have not met the same success. Nonetheless, with all the good and bad of his reforms, Cuba is still much better off than it was under the repressive Fulgencio Batista.

6. **The impact of enrichment on spatial memory in long evans rats exposed to ethanol.**

S. E. Percy

L. R.G. Pickens, Ph.D., Assistant Professor of Psychology

Cognitive enrichment has recently been used to attenuate long term memory deficits as experienced with injury or neurodegeneration (Dahlqvist, et al., 2004; Berardi, et al., 2007). The present study sought to investigate the role of cognitive enrichment, not on long term memory problems, but on transient memory deficits as seen with ethanol exposure. Twelve male, Long Evans rats were separated into an enriched or restricted group. The rats in the restricted condition were housed individually without toys, whereas rats in the enriched group were pair-housed, received paper tube toys in their home cage, and were taken to a play area every other day to interact with the other enriched rats for thirty minutes. Following this 15-day enrichment period, rats trained for 4 days in the Morris Water Maze (MWM) task, a widely used procedure used in behavioral neuroscience research to study spatial memory, in which the goal for the animal is to use various spatial cues within the circular tank to swim to the location of a hidden platform under the water's surface. Following acquisition training, rats were exposed to both a saline control and a low dose of ethanol on alternating days to investigate the role of enrichment on transient memory impairments caused by ethanol exposure. Escape latency (the time it takes the rat to reach the hidden platform) and overall velocity of the rat will be analyzed using EthoVision XT tracking software (Noldus Information Technology).

7. **Using biotic indices to determine water quality in little Shenango River**

A.T. Rentz

M.T. Balas, Ph.D., Professor and Chairperson, Department of Biology

This study was conducted in order to establish the feasibility of utilizing Biotic indexing as a means for the determination of water quality in the Little Shenango River near Sharpsville, Pennsylvania. Applying collection parameters was critical to ensure any bias during the collection process. A parameter of 91.44m was set for the collection distance and the collection sweeps were limited to 30 sweeps per site. Utilizing a kick-net, the specimen were collected from two separate sites, as well as different water conditions. Collection conditions ranged from fast moving shallow water, typically 0.152m or less to deeper pools ranging in depth from 0.152m to 0.914m. Collections resulted in a vast array of organisms from multiple classes and Phylums, however this study focused on Insects. A total of 178 samples were collected with 104 being insect and insect larvae. Using the formula created by William Hilsenhoff, in conjunction with an organism tolerance chart, a biotic index result of 2.93 was found. Utilizing the Family Biotic Index (FBI), also developed by Hilsenhoff, the Little Shenango River was determined unlikely to be polluted.

8. **Comparison of Water Quality between the Conodoguinet and the Yellow Breeches Creeks**

S. M. Stouffer

M. Balas, Ph.D., Professor of Biology, head of Biology Department

The Yellow Breeches and the Conodoguinet Creeks water quality was tested using a form of a biological index by collecting various aquatic insect larvae that exist only in water quality that ranges from excellent to good conditions. Insect larvae was collected at each creek over a period of 15 days, identified on sight, counted, and recorded by species. A T-test was performed to see if there was a significant difference in the number insects for each of the six groups that were collected. Overall results show that for two of the groups, mayflies and damselflies, a greater number of pollution insects were found in the Conodoguinet. For one of the six groups, caddis flies, the Yellow Breeches, showed a greater number of insects were found. Therefore, there is a slightly greater difference in water quality.

9. **Nicaragua: Where we learned it does not take money to make someone rich.**

Thomas Pulice

David R. Buck, Ph.D., Associate Professor of History

For this poster presentation, I plan to outline the Thiel College service trip to Managua and La Paz. In regard to Managua, I plan to include information about Women in Action and their goals and explain the problems that I encountered in Managua. Especially the pollution of the Lake. I will provide information concerning the culture that surrounded us and explain what it was like to live in the urban area of La Prima Vera. The other part

of the poster will focus on La Paz. In La Paz, I will illustrate what life seemed to be like in La Paz and how even for a rural area it seemed like there were a lot of things that were going on, focusing on Jorge's Farm and what the house was like. As well, I will show what our service projects. Explain how the gray water system works, and what changes we made too it. I also plan to explain the methane gas system. I would like to explain the differences in culture that we saw from La Paz and Managua, and even the differences of the people at the Crater Lake. There was a large difference in the way that the people were.

10. **Frequencies and severity of hand injuries amongst male athletes in various sports**

L. D. Shine

N. G. Despo, Ph. D., Professor of Biology; M. T. Balas, Professor of Biology

A correlation of the frequency and severity of hand injuries of male athletes can be used to determine if a relationship exists between how many palmer/digital injuries suffered affects how severe the injuries will be to the athlete. Correlation analysis of the severity of the injuries in each sport was used to determine which sport should become a focus for short and long term rehabilitation as well as development of forearm-wrist-thumb, forearm-wrist-hand, and hand orthotics. Each sport either displayed a relationship or did not show a significant relationship. The sports sampled were football, baseball, lacrosse, rugby, and basketball. Football's sample size was 24 and produced a P-value of 0.975 and a correlation coefficient of 0.005. Baseball's sample size was 9 and produced a P-value of 0.817 and a correlation coefficient of 0.108. Lacrosse's sample size was 7 and produced a P-value of 0.297 and a correlation coefficient of -0.392. Basketball's sample size was 6 and did not produce a P-value or correlation coefficient because, of the athletes who filled out the survey, all were registered as one time injuries with different severities so there was no other frequency of injuries that could have been compared. However, of all the previous sports that did not show relationships, rugby had a sample size of 13 and did produce a P-value of 0.060 and a correlation coefficient of 0.535. Rugby's P-value fell within my significance level of 0.10 and did show a positive, but weak relationship with the coefficient value of 0.535. I'd like to conclude that when rugby athletes' frequency of injury increased, the severity of their injuries also increased. Rugby will be chosen as the sport for the focus of further study and rehabilitation/prevention techniques. Long term issues were not associated with frequency and severity of injury overall.

11. **Pollution intolerant insect presence to determine water quality in rural and urban water systems**

C. J. Capp

M. Balas, Ph.D., Professor of Biology; F. Palé, Ph. D., Professor of Biology

The sampling of water systems for pollution intolerant insects is a cheap and efficient way of determining the amount of pollution that is being released into the ecosystem. The pollution intolerant insects that were studied are mayflies, caddisflies, and

stoneflies. All of these insects have a larval stage that resides in flowing water systems and they can only tolerate acidic levels as far as 5.5 on the PH scale and their max toleration for basic waters is 7.5. The streams of the area that were studied were the Little Shenango (urban) and the small Sugar Run stream that runs by Pymatuning state park. Small sections of 50 foot lengths of the streams were selected to scan while nets were used to capture the specimens. Only the specimens pertaining to the experiment were be tallied and then released when the collection had been completed. This study is a precursor for further studies of the waterways in the area as to where the pollution is coming from.

12. **The effects of caffeine on fatigue time in mice**

M. E. Crissman

N. G. Despo, Ph. D., Professor of Biology; M.T. Balas, Ph. D., Professor of Biology

Caffeine is a central nervous stimulant that acts to increase heart rate, constrict blood vessels, relax air passages, and allow certain muscles to contract more easily (Chudler). Due to these characteristics as well as its increasing popularity in our society, many studies have been completed involving caffeine in relation to exercise performance. In this study, the effects of increasing dosages of caffeine—0.02 mg, 0.04 mg, 0.06 mg, and 0.08 mg— on the amount of time mice were able to run on a rodent treadmill—fatigue time—were investigated in order to determine whether or not caffeine acts to increase fatigue time in general, as well as whether or not a linear correlation exists between the dosage and fatigue time. Through several two-sampled t-tests, it was determined that the dosages of 0.04 mg, 0.06 mg, and 0.08 mg significantly increased the amount of time it took the mice to reach fatigue. A regression analysis, however, revealed that no correlation exists between dosage and fatigue time.

13. **The Effectiveness of Various Food Additives Toward Enhancing the Attractiveness of Peanut Butter for Live-Trapping Small Mammals**

S. M. Eveland

M. Balas, Ph.D., Professor of Biology, head of Biology Department; N.G. Despo, Ph.D., Professor of Biology

Peanut butter has always been a favorite when it comes to trapping small mammals, especially from orders Rodentia and Insectivora. So if other foods were added to the peanut butter, would it make the bait more attractive to these small mammals? It was hypothesized that if certain foods were added to the peanut butter, it would increase the attractiveness of the peanut butter. Anise oil, honey and oatmeal were mixed with peanut butter. Two different sites were used to minimize bias. Site D was a domestic yard setting and site F was a forested setting. The study revealed that in the backyard, the baits were less popular because of the abundance of birdseed from multiple feeders. In the forested area however, the baits were more popular because food was less available. Overall, when the two sites were combined, the study revealed that the food additives did make the peanut butter more attractive to small mammals.

14. **Interpregnancy Intervals and Adverse Birth Outcomes**

Jihan Lewis

Nick Despo, Ph.D., Professor of Biology

I investigated the prevalence and correlates of short interpregnancy intervals in 9 specific counties/boroughs within 120-122 miles of Greenville. There was a significant correlation between women, whose successive interpregnancy interval was less than six months – 1 year, being more likely than other women to have had a child with an adverse birth outcome of birth defect, low birth weight or premature birth. Those born within a longer interpregnancy interval of at least 2-3 years had a significantly lower occurrence of being born without one of these adverse birth outcomes. Teenage mothers whose subsequent interpregnancy interval was less than six months – 1 year were even more likely than either of these groups of other women to have had a child with an adverse birth outcome. Offering advisement regarding the possible negative consequences of short interpregnancy intervals and improving women's contraceptive use to lower rates of unplanned pregnancy likely would reduce the amount of short interpregnancy interval pregnancies in both Pennsylvania and, furthermore, the United States.

15. ***Sportexe* (athletic turf): investigation of the different types of bacteria that grow on synthetic grass**

L.A. Mantick

S. J. Swerdlow, Ph.D., Assistant Professor of Biology

Thiel College as well as neighboring high schools, colleges, and members of the Greenville community use the synthetic grass known as *Sportexe* that is located in the athletic field in Alumni Stadium. The synthetic grass features a sand and rubber mix that makes for a fast, dense and firm playing surface for the athletes. This study investigates the different bacteria that can grow at a range of temperatures from turf samples. My hypothesis is that many different types of bacteria will grow and that the strains will differ based on the temperature. Also, there is the possibility that at least one of these bacteria could potentially affect humans. Samples of turf were collected from under the Rissell-Schreyer dome and placed on agar blood plates and incubated at 25°C, 30°C and 37°C for 18- 24 hours. Seven different characteristics of the colony morphology, including elevation, margin, whole colony shape, size, texture, color, and hemolysis were analyzed. From this investigation, three different types of bacteria with similar colony morphology were found to grow in the turf. The importance of this study was to determine if Thiel College's synthetic turf had bacterial growth. My hypothesis was supported by the growth that was found from the turf but the findings could not support that the bacteria is harmful to humans. In future studies it would be interesting to identify the specific strain of bacteria in order to further characterize the affect, if any, on athletes.

16. **The effect of distance on pine cone size of the Norway Spruce-*Picea abies* (L)**

Tyler Hanks

Fatimata Pale, Ph.D., Professor of Biology

There are many factors influencing the growth of pine cones of the Norway Spruce-*Picea abies* (L.). This research aimed to investigate the effect of the distance from the Rocky River in Cuyahoga County in Ohio, on pine cone size. The sampling distances from the river were 5, 20, 35, 50 meters. Every other week for five months, ten pine cones were collected in four plot distances from the river. This research showed that the greater the distance from the river the longer the size of the pine cone.

17. **Response to food calling in domestic chickens (*Gallus gallus domesticus*) based on social rank**

R. L. Smith

M. T. Balas, Ph.D., Professor of Biology

Food calls are a series of quick, high-pitched clucks used by domestic chickens (*Gallus gallus domesticus*) to gain the attention of others and direct them to a food source. A cock may give this call in the presence of other chickens, especially hens. In this study, I observed how many chickens in a flock of 17 responded to both live and recorded food calls from two cocks of different ranks in status. One vocalization came from the dominant cock and the other was of a younger, subordinate cock. Responses were counted as chickens approaching the area from which the call was given. It was found that the live call of the dominant cock received the most attention from others. All recorded calls failed to elicit responses from any of the chickens. This information supports my hypothesis that the food call of a high-ranking chicken will provoke more response than that of a lower-ranking chicken. However, it also suggested that the actual presence of the calling individual has an influence on responses.

18. **The Effects of Remicade® Infusions on Rheumatoid Arthritis**

K.J. Young

N.G.Despo, Ph.D., Professor of Biology

Rheumatoid Arthritis (RA) affects 1.3 million people in the United States and is one of the most common autoimmune diseases worldwide. RA is a chronic disease that leads to the inflammation of joints and causes morning stiffness; joint tenderness or stiffness; loss of range of motion; bone deformities; chest pain when taking a breath; dry eyes and mouth; eye burning, itching, or discharge; nodules under the skin; numbness, tingling, or burning in hands and feet; and sleep difficulties. Remicade® infusions are injections that contain infliximab, which is an antibody that binds and counteracts the activity of the TNF- α (tumor necrosis factor) that causes the inflammation in RA. The aim of this study was to determine if Remicade® infusions would decrease the symptoms of Rheumatoid Arthritis over a six-month period. Further, the study intended to determine which symptoms of RA were most affected by the infusions. To fulfill these aims, a

questionnaire that assessed the symptoms and severity of RA was administered to 20 patients every time they received a treatment. It also contained a list of common aids and a pain scale. Patient scores were then evaluated using a Wilcoxon Signed Ranks test with a 95% confidence interval via Minitab 16. The results of this experiment demonstrate that the condition of the patients remained approximately the same during the six month period. However, the pain scale was the only category that increased. This indicates that Remicade® infusions helped to impede the progression of the disease and stopped the symptoms from becoming more severe. A concern is that the pain scale results may be clouded by other conditions that the patients may have. These findings support the manufacturer's claim that Remicade® infusions stop the progression of the disease.

19. **The study of how dogs react to different colors using their peripheral vision**

C.M. Polan

S.J. Swerdlow, Ph.D. Assistant Professor of Biology

Dogs experience insensitivity to the emission of green light, meaning they cannot distinguish between the colors green, red and yellow also known as red-green colorblindness (Peter, 2013). Humans have a richer and more intense vision because humans have three types of cone cells in the eye that recognize red, green and blue whereas dogs only have two kinds of cone cells, yellow and blue (Peter, 2013). For this experiment, various colors were tested, red, green, yellow, blue and black, to determine which color dogs respond to the fastest. Six dogs, between the ages 2 and 5, with medium obedience levels were selected and a piece of 12X12 paper that was either red, green, yellow, blue and black was held up and the time it took for the dog to react was recorded. My original hypothesis for this experiment was that; the dogs will react faster to the colors yellow and blue rather than the red and green since they are red-green colorblind. The results do not support this hypothesis but rather that the individual dog is the most important factor when testing reaction time in this setting. The importance of this study is to further test and determine if dogs can distinguish between objects based on brightness or actual color. Future experiments to further test this would be to place dark and light colored pieces of paper in front of the dogs and then switch the brightness of the two colors.

20. **Effectiveness of natural vs. synthetic acne treatments against *Propionibacterium Acnes* bacteria**

A.E. Davis

S.J. Swerdlow, Ph.D. Assistant Professor of Biology

Acnes vulgaris is a common skin disease experienced by most people at some point in their lives (4). Many acne treatments are available that have bactericidal properties. Two such treatments are Proactiv® "Repairing Treatment" and 100% natural tea tree oil. The main active ingredient of Proactiv® is the synthetic compound Benzoyl peroxide (2).

Tea tree oil is a natural alternative to synthetic products such as Proactiv® (3). *Propionibacterium Acnes* (*P.acnes*) is one type of bacteria that is known to cause acne (4) and *M.luteus* is a normal skin flora that has not been shown to cause acne (7). In this study, I investigated which treatment, Proactiv® or tea tree oil, was the most effective *in vitro* at killing acne causing bacteria. I hypothesized that both treatments (tea tree oil and Proactiv®) will be effective at killing bacteria, but that Proactiv® will exhibit a greater zone of inhibition. The results of this study indicated that there is no significant difference between *P. acnes* and *M.luteus* when treated with Proactiv® and that there is no significant difference between *P.acnes* and *M.luteus* when treated with tea tree oil. There is a difference between Proactiv® and tea tree oil treatments themselves, indicating that tea tree oil is more effective at inhibiting the growth of *P.acnes* and *M.luteus*, *in vitro*. This study contributed to the knowledge of how *P.acnes* and *M.luteus* are affected by these acne treatments *in vitro*, which can be of use in future studies.

21. **Effect of *Pfaffia paniculata* powder on fatigue time in mice**

N.R. Blazeovich

N.G Despo, Ph.D., Professor of Biology; M. Balas Ph.D., Professor of Biology

The purpose of this study was to test the effects subcutaneous injection of *Pfaffia paniculata* (Suma Root) powder had on the fatigue times of mice. *Pfaffia paniculata* is an adaptogenic herb from South America used for many practical uses such as chronic fatigue syndrome and has even been used as a steroid to improve endurance for physical activity. A total of fourteen mice were used to conduct this experiment, seven as a control and seven as an experimental group exposed to *Pfaffia paniculata* powder. Mice of the experimental group were injected daily with 0.2 ml of powder mixed with water containing 2 mg of powder per mouse. Running on the treadmill at 15 m/min occurred every other day and fatigue times were recorded in minutes. Fatigue times were recorded as the time once the mouse fell back on the treadmill to the point of being shocked. As a result mean fatigue times for the experimental mice injected with suma root powder were 3.39 ± 0.91 minutes and 2.32 ± 0.57 minutes for the control group. However, statistical test using a t-test proved that the times between the control and experimental groups were not significant. As a result from this experiment, a trend does appear as the mice injected with suma root powder did on average have higher fatigue times however, the difference was not significant. Further experimentation is needed with a larger sample size to conclude if injection of suma root on fatigue time is significant.

22. **The Effects of Invasive Kentucky Blue Grass (*Poa pratensis*) on Native Populations in Northwest Indiana, Northeast Illinois, and Southwest Michigan**

K.R. Mathy

M.T. Balas, Ph.D., Professor of Biology

Invasive species are species that are present where they are not native. This is an issue because many times these species can thrive in their nonnative environments since there aren't any natural predators, which in turn can hinder the growth of native species in various ways. The individual presence and amount of Kentucky Blue Grass (*Poa pratensis*), garlic mustard (*Allaria petiolata*), oriental bittersweet (*Celastrus orbiculatus*), and multiflora rose (*Rosa multiflora*) were recorded using the North Carolina Vegetation Survey method at various sites in Northwest Indiana, Northeast Illinois, and Southwest Michigan. The hypothesis that was tested was to see if there was a correlation between the amount of each species present and the number of native species present per site. Each plot at each site where the species were present, a correlation test was performed. The correlation test was completed by comparing the amount of each individual species present and the number of native species present at each plot. *A. petiolata*, *C. orbiculatus*, and *R. multiflora*, did not show significant correlations. However, in *P. pratensis*, a significant negative correlation was found; results included a negative Pearson correlation value of -0.354 and a P-value of 0.037.

23. **An examination into the physical mutations and altered social interactions, feeding habits, and overall quality of life of *Pimephales promales* after exposure to glyphosphate**

J. A. Amorose

N.G Despo, Ph.D., Professor of Biology

RoundUp, a commercial weed killer, contains glyphosphate. While the half-life of glyphosphate in water ranges from three to thirty days, its half-life in the sediment surrounding a water source can extend to 120 days. Also, during a freeze, glyphosphate has been found to persist for over a year. Glyphosphate is not extremely hazardous to humans; however, studies show that concentrations of this chemical can persist within amphibians, causing physical mutations, altered social habits, and even death. It was hypothesized that these effects of glyphosphate exposure to the *pimephales promales*, or fathead minnow, would prove more drastic in higher, rather than lower, concentrations of RoundUp. To test this, a control was set by placing ten fathead minnows in 18.93 liters of water. For the four test tanks, ten minnows were placed into each. The ratio of weed killer to water for each test tank was as follows: 0.5 uL per L; 1.0 uL per L; 1.5 uL per L; and 2.0 uL per L. After the addition of the RoundUp, the fish were examined after four, ten, twenty-four, and forty-eight hours. The amount of deceased fish, swimming activity, and overall quality of life for fish in each environment were examined. After forty-eight hours, the results showed a significant impact on fish exposed to higher amounts of glyphosphate. The following are the percent of death in the 2.0 uL, 1.5 uL, 1.0 uL, 0.5 uL, and control tanks respectively: 90%; 40%; 30%, 30%;

and 30%. Fish in the 1.5 and 2.0 uL tank showed decreased response, slow movements, and altered swimming styles, such as upside-down or spiral swimming. This experiment exemplifies the physical and neurological effects of glyphosphate on *pimephales promales*, a prominent bait fish, and it displays a need for further studies regarding the dangers of RoundUp on local ecosystems.