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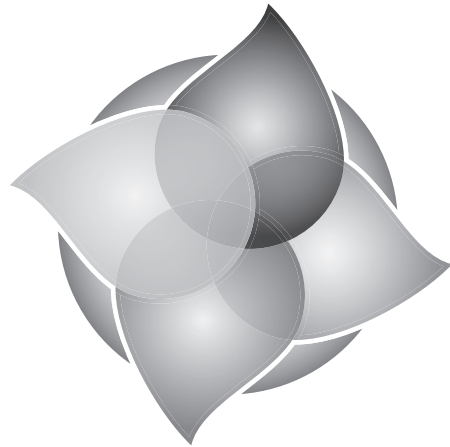
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Eighth Annual



Research & Scholarship
SYMPOSIUM

April 12, 2017

cedarville.edu/RSSymposium

PERFORMANCE PRESENTATIONS

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Christopher DeShields	Undergraduate Student	Music and Worship	Ernest Bloch's Suite Hebraique: Far-Away Images
	This presentation is designed to showcase the suite for viola written by Ernest Bloch in 1951. I will be expounding on the background and the history of this suite, including the composer's inspirations for it, the images that each of the movements portray, and the elements of Jewish music that are used that connect this music with those images.		
Luke J. Williams	Undergraduate Student	Music and Worship	Melodic Voicing: How to have a professional sounding Melody in 7 weeks
	This presentation will show the first chapter of a method that will help piano teachers teach melodic voicing to a wide range of piano students. This is the first time that these concepts have been packaged as a method.		
Wesley Y. Kane	Undergraduate Student	Music and Worship	Desenclos' Prelude, Cadence et Finale: Harmonic Progression and Motivic Content Achieved through Solo Voice
	There is an idiom that form and harmony can only be achieved through multiple voices. Many of such examples are consistent with the piano medium. However, this idiom is challenged in Desenclos' Prelude, Cadence et Finale written for alto saxophone and piano. Despite the piano accompaniment, thematic harmonic progression takes place in the saxophone part, most highlighted in the Cadence section. I hope to share many techniques Desenclos has used to create motivic content, whether through elements of tritone usage, pentatonic scales, or systematic intervalic relationships. For time purposes, I will be focusing on the first two sections of the piece, talking and playing interspersed.		
Joseph Morris	Undergraduate Student	Music and Worship	The Gregson Tuba Concerto Movement 1
	Tuba Concerto by Edward Gregson is a staple in the Tuba repertoire. It has several different things that make it an interesting piece to play and analyze. I will be speaking on and then performing the first movement, with the assistance of Sean Kisch on piano.		

PODIUM PRESENTATIONS

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Stanley Schwartz	Undergraduate Student	History and Government	Petty Passions, Nobler Actions, and Two Peculiar Institutions: Sectionalism, Partisanship, and the United States Senate, 1845-1850
	The period from 1845-1850 was a critical moment in American history, as the question of the expansion of slavery into western territories battered the nation, turning a political system until then focused on issues of tariffs and banking, to the decision of sectional and moral questions. Despite the emotion and danger of the time, the Senate, which ultimately decided the questions of slavery's expansion, brokered the Compromise of 1850, a measure that stemmed the sectionalist fervor for a time. This was achieved only through the seasoned leadership and sacrifice of uniquely great American political leaders, overcoming complications of party and section. Nevertheless, the challenges to long-term national political health remained, leading to the Compromise's undoing only four years later due to flaws evident during the period of its development and construction. The United States Senate, addressing the expansion of slavery from 1845-1850, failed to sufficiently resolve the growing moral, political, and ideological tension with the Compromise of 1850 because of the opposing sections, divided parties, separate generations, and conflicting leaders which characterized the body. This paper examines the institutional context of the Senate's actions from 1845-1850, including the political party system, growing sectionalism, and the rise of a new generation of political leaders, from the perspective of the great Senators of the period, Henry Clay, Daniel Webster, John C. Calhoun, and Thomas Hart Benton. Quantitative analysis of voting patterns in the Senate during the period is mixed with qualitative research for insight into the Senate's action and dynamics. Thus, a model of short-term sectionalism is arrived at, illustrating why the Senate rejected some compromise plans and passed the Compromise of 1850, which was a short-term solution to the problem of slavery.		
Amy Searl	Undergraduate Student	History and Government	Politics of the first Great Awakening
	Though most Christians today think of the Great Awakening, the period from about 1730 through the 1740s, as a clear outpouring of God's Spirit, not all were convinced in the heat of it. Those who were in favor of the revivals were called New Lights, and those opposed to the movement Old Lights. This distinction remained mostly unquestioned in scholarship until Thomas Kidd's <i>The Great Awakening: The Roots of Evangelical Christianity in Colonial America</i> . In this work, Kidd proposes a different grading method. Rather than a dyadic scale, Kidd suggests a continuum better fits the ideologies. The Old Lights are still the anti-revivalists, according to Kidd, but the New Lights are divided. The enthusiastic, entirely pro-revivalists would be radical evangelicals, while the cautious revivalists would be moderate evangelicals. Studying the era confirms Kidd's theory, as it is clear that revivalists were not all in agreement. The classification of Old and New Lights implies that the New Lights were united against the Old Lights. This assumption, though, is egregiously false. Since the beginning, evangelicals have differed on many theological points. Churches had genuine disagreements over the nature of salvation and the purity of doctrine, among other issues. Even as the Great Awakening spread religion throughout the colonies, it divided the church. The movement left a legacy of division and disagreement along with its powerful spiritual impact. Evangelicals were never actually united.		
Jacob T. Mach	Undergraduate Student	History and Government	Hitler, Anti-Semitism, and the Demise of the Third Reich
	Adolf Hitler, the leader of Nazi Germany from 1933 to 1945, is most well-known for two particular political/societal standpoints: German nationalism, and namely, anti-Semitism. Hitler served as the chairman of the Nazi party from 1921 till its questionable rise as the dominant party in pre-war Germany. He then rose to the position of Chancellor, and ultimately, the Fuhrer. Historically, the Nazi Party was known for anti-Marxism (anti-communism), anti-capitalism, anti-democracy, and anti-Semitism. Hitler's rise to power in the Nazi Party shifted the focus, drawing the party away from many of its foundational tenants. During the Second World War, the "Final Solution" to the Jewish question became the chief focus of the Nazi Party. Its preeminence is demonstrated by Hitler's allocation of large numbers of militarily valuable men and resources to systematic extermination of Jewish people all over Europe. Two schools of thought, Functionalists and Intentionalists, represent the historical debate on this topic. Intentionalists argue that Hitler was planning the Holocaust even before his political career, whereas Functionalists argue that the Nazi Party itself was responsible. This essay will argue that Adolf Hitler took control of the Nazi Party, elevated his own doctrine to the forefront, in effect, using the Nazi organization as a political tool to carry out his personal desires, demonstrated in his relentless pursuit of the "Final Solution." In short, Hitler's commitment to the eradication of the Jewish people overshadowed even his military aspirations, hastening the demise of the Third Reich.		

PODIUM PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Amy Searl Stanley Schwartz	Undergraduate Students	History and Government	A Study of the Correlation between Immigration and Terrorism
	<p>In late January, President Trump signed an executive order banning non-American citizens travelling into the United States from seven different countries. The title of the order was, "Protecting the Nation From Foreign Terrorist Entry Into the United States." As implied, the stated purpose was to limit the number of immigrants in order to avoid future attacks. Since the order took effect, people have argued against it, making claims about religious discrimination, Islamophobia, and more. Beyond the religious issue, though, remains the question of efficacy. Many have contended that no immigrants from these particular countries have carried out successful terror attacks on the United States. President Trump is advancing nationalist interests, while critics contend his actions are unfounded. This argument and the executive order both assume a connection between terrorism and immigration. For the order to serve a purpose, immigration must play a role in terrorism. Few have questioned this link in general, though some contend against the particulars. In this study, we attempt to discover if a link exists between immigration and terrorism by examining the current literature and using data to analyze the levels of immigration as well as the incidents of terrorism in six countries. Looking at recent events, it is obvious that terrorism is a problem. Since attacks are genuine threats, correct identification of the source of terror becomes important. The question is whether immigration increases terrorism. Our hypothesis is that countries with higher acceptance of asylum seekers will experience higher numbers of terror attacks. We are seeking to find out if there is a strong correlation between the two factors. The null hypothesis, then, is that there is no correlation between immigration and terror.</p>		
Audrey S. Rutt	Undergraduate Student	Music and Worship	A Blend of Traditions: The Lute's Influence on Seventeenth-Century Harpsichord Repertoire
	<p>The close relationship between the harpsichord and lute traditions is commonly claimed but rarely elaborated upon, and many experts disagree on the manner in and extent to which the two are related. Often, texts covering the early harpsichord literature will limit discussion of the lute's influence to a brief mention of the style <i>brisé</i>, if the important connection between the two traditions is even mentioned at all. The lute's impact on the harpsichordists of the seventeenth century is not a facet that can be ignored; rather, an understanding of the lute tradition is essential to an understanding of the harpsichord tradition. Neither can the relationship be isolated to the style <i>brisé</i>, as the influence extends also to other textures, rhythms, harmonic devices, sonorous effects, and genres found within the solo literatures of both the lute and harpsichord. This connection is especially evident in the solo harpsichord works of Francois Couperin, D'Anglebert, Froberger, and Chambonnières. Ornamentation and broken textures, elements that were evocative of the lute, were incorporated into the already existing keyboard tradition represented by the organ. However, although composers for the harpsichord imitated the style of lutenists such as Gaultier and Pinel, they also transformed it; they developed these lute-like elements in a manner that became distinctly idiomatic to the harpsichord. In this way, the harpsichord idiom that emerged in the seventeenth century was formed by a unique blend of the organ and lute styles.</p>		
Sharri K. Hall	Undergraduate Student	Music and Worship	The Doctrine of Affections: Where Art Meets Reason
	<p>The Doctrine of Affections was a widespread understanding of music and musicality during the Baroque era. The Doctrine was a result of the philosophy of reason and science as it coincides with music. It aimed to reconcile what man knew about science and the human body, and what man thought he knew about music. It was a reconciliation of practical musicianship and theoretical music which had begun to rise in the time. Though it is generally understood as being apart from Enlightenment thinking, the Doctrine is a result of Enlightenment-style philosophy. As the Enlightenment sought to explain why things occurred in nature, the Doctrine of Affections aimed to scientifically explain man's reaction to music. It presumed that emotions could be represented and elicited through specific figurations of music and it perceived that music could possibly relate with the body humors and remedy illness and imbalance. The Doctrine of Affections directly shapes musical composition through specific modes and tonalities, meters, and rhythms all culminating in the "Baroque" style. Its influence is overwhelmingly present in the music of J.S. Bach and Handel. Affections, in conjunction with the four temperaments and body humors, thusly result in specific emotional reactions in listeners.</p>		
Joshua L. Dissmore	Undergraduate Student	Music and Worship	Baroque Music and the Doctrine of Affections: Putting the Affections into Effect
	<p>This paper attempts to prove that throughout the Baroque period, the Doctrine of Affections governed musical composition through the musical elements of intervals, key, and tempo. This Baroque practice of relating music with various emotions dates back to ancient Greece and the teachings of the four temperaments, which were each associated with specific affections. Music allegedly had the ability to arouse these affections within the individual to produce an intended emotional response. Through the careful examination of the works of prominent Baroque composers and philosophers such as Johann Mattheson, J. S. Bach, and Antonio Vivaldi, this paper demonstrates how the Doctrine of Affections had an undeniable influence upon the overwhelming majority of Baroque music. Specifically, intervals, depending on their size and direction, can evoke emotions ranging from fear and sorrow to joy and excitement. Likewise, certain key signatures suggest gloom and darkness, while others impart feelings of elation and security. The Baroque philosophers, Johann Mattheson and Johann Joachim Quantz even completed comprehensive guides that outline the various musical elements and their affective uses. Although the examples cited in the paper only represent a minuscule sample out of the overwhelming breadth of Baroque music, they offer a useful framework for understanding Baroque works as a whole.</p>		
Michael S. Carbaugh	Undergraduate Student	Music and Worship	Film Score: The Romantic Ideal
	<p>Though film scores bear the marks of modern music in many ways, they are, in themselves, a Romantic endeavor. In this paper, I will discuss the history and development of film score as a musical style. I will then discuss the modern elements of film score. Finally I will categorize film score as a Romantic endeavor and make some predictions based on the implications of this idea. This style developed during the 20th century, so it does indeed bear some marks of modern composition. The biggest influence from the modern era is simply the vast diversity in compositional approaches and musical styles presented in film scores. Some of these approaches and styles can be identified with any of the music eras, including the modern era. However, what makes film score Romantic is the ideal. Romantic composers were obsessed with portraying emotion and feeling. The ultimate Romantic composition was always programmatic, meaning it was a response to an extra-musical subject matter. Film score's primary aim is to elicit an emotional response from its audience, which is, as I mentioned, a Romantic endeavor. Also, the music in films is incredibly programmatic since it is entirely dictated by the film. In fact, it would not be an appreciated classical art form if it were taken away from the film, because it often lacks aesthetic depth. Therefore, film music is, in itself, a Romantic endeavor.</p>		

PODIUM PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Brittany L. Roberts	Undergraduate Student	Music and Worship	The Triple Harp: The Unsung Hero of Harp History
	<p>Graced with thousands of years of history, the harp has evolved and adapted to many different musical eras. A prime example of this is the triple harp, a precursor of the modern pedal harp. Before the invention of the pedals, harpists found it difficult to adjust to the increasing chromaticism found in the ornamentation and chord progressions of the Baroque era. However, harp builders were not deterred by this challenge. First built by Italian luthiers in the early 1600's, the triple harp featured three layers of strings stretched parallel to one another. The two outer layers were tuned diatonically to a particular scale while the middle layer was tuned to the half steps absent from that scale. This harp boasted a rich, resonant bass and sparkling treble which could accomplish the duties of basso continuo and solo repertoire equally well. Also referred to as the "Baroque harp" or the "arpa doppia," this new harp was well received by many in Europe. Triple harpists found a welcome place in courts and chamber groups. Several Baroque composers wrote for it, including George Frideric Handel. When harp makers from Wales discovered the triple harp, they crafted a model of their own. The Welsh enthusiastically adopted it as part of their culture. Even after the invention of the pedal harp, Wales continued to compose and perform pieces for their triple harp. To the present day, this instrument remains as a stunning example of human ingenuity in adjusting the harp to society's ever-changing musical climate.</p>		
Emily A. Sulka	Undergraduate Student	Music and Worship	Shakespeare's Philosophy of Music
	<p>Shakespeare is one of the most widely read figures in literature, but his use of music is not usually touched on in literary discussions of his works. In this paper, I discuss how Shakespeare portrays music within the context of his plays, both through dialogue and songs performed within each work. In Shakespeare's time, Boethius' philosophy of the music of the spheres was still highly popular. This was the idea that the arrangement of the cosmos mirrored musical proportions. As a result, every aspect of the universe was believed to be highly ordered, and this idea is prominent throughout Shakespeare's works, from <i>Hamlet</i> to <i>A Midsummer Night's Dream</i>. To make this clear to the reader, I discuss dialogue symmetry weaved throughout <i>The Merchant of Venice</i>, clear allusions to the music of the spheres in <i>Pericles</i>, and the use of music as a signifier of the strange and mysterious – from madness to love – in numerous works, always relating these topics back to the philosophy of the music of the spheres. In order to compile this information and make it clear, I researched the philosophy of music during Shakespeare's era. I also researched how he uses music thematically to emphasize different characters' struggles as well as plot details. After examining his plays as well as the other sources available on the subject, it is clear that Shakespeare was highly influenced by the philosophical and practical ideas regarding music of his time, specifically the theory of the music of the spheres.</p>		
Adam Paul Rinehart	Undergraduate Student	Music and Worship	French Society Abroad: The Popularization of French Dance throughout Europe, 1600-1750
	<p>This paper explores the dissemination of French dance, dance notation, and dance music throughout Europe, and it explains the reasons why French culture had such an influence on other European societies from 1600-1750. First, the paper seeks to prove that King Louis XIV played a significant role in the outpouring of French dance and the arts. Next, the paper discusses prominent French writers of dance notation who influenced the spread of French dance literature and training throughout Europe. Finally, the paper delineates European composers and their involvement in the development and production of French dance music. Using academic, peer-reviewed journal articles, books, and other scholarly sources, this paper seeks to accurately present the information in an orderly fashion. The paper contains visual evidence of dance and music notation to assist the reader in understanding the subject matter. Additionally, theories of contemporary authors as well as authors from the time period are discussed to present concrete evidence. The two main types of dance discussed in the paper are ballroom and court dances, which were prominent within the French royal court. One major finding of the research is the fact that French court and ballroom dances were specifically designed to communicate the power and prestige of King Louis XIV; consequently, other European countries were influenced to strive for similar prestige. Another finding is that many forms of French dance notation were translated and published in other countries, which increased the use of French dance throughout Europe. Musically, European composers such as Handel and Mozart included elements of French dance music in their compositions, and thus played a significant role in prevalence of French dance music throughout Europe. Overall, this paper proves that French dance received wide recognition due to political influence, availability of dance notation, and the involvement of prominent composers.</p>		
Gracie Bennett	Undergraduate Student	Music and Worship	The Science of Singing: A Voice Lesson from Anatomy and Physiology
	<p>The voice is the oldest instrument in existence. Throughout its history, there have been many vocal performance practices. The purpose of my research is to show the correlation between modern vocal practices and the current medical technology available to help us understand the physiology of the voice. I am studying and analyzing the vocal performance and pedagogical practices from the early church to present day. I want to know why these vocal strategies have changed over time. There have been several different schools of thinking in regards to vocal practices: from the Italian style <i>bel canto</i> singing that was widely popular in the sixteenth century and opera to more current techniques, including the Alexander technique and The Estill voice model. One common and easy way to explain these shifts in vocal techniques would be attributing it to stylistic changes in music throughout history. The issue with style changes being the only evidence for this shift, however, is that vocal practices didn't change with every single change in style eras in music history; it was a more gradual, than rapid, change. It wasn't until the early 19th century that vocal practices began to take a turn. In the past millennium, the majority of vocal techniques emerged in the past century or two. This begs the question: what is it about modern time that has inspired so many vocal strategies to emerge? The answer: technology. The advancement of medical technology and the scientific study of the vocal folds influenced a change in vocal performance practices and pedagogical approaches to singing.</p>		
Haley J. Perritt	Undergraduate Student	Music and Worship	From Modal to Tonal: The Influence of Monteverdi on Musical Development
	<p>In efforts to prove the transition from modality to tonality in the late Renaissance era, this paper uses examples from the works of Monteverdi to reveal the shift to tonal music. By examining his background in music theory and his involvement within the church, it is evident that Monteverdi's upbringing in music later affected his musical compositions. Being raised in Cremona, a city in close proximity with Milan, he was exposed to a wide variety of music and excellent instruction, especially from the church cantor Marc' Antonio Ingegneri. Through score study and evaluation of Monteverdi's early madrigals and his famous opera <i>L'Orfeo</i>, one can see the transition that took place from the modal to the tonal system. Early madrigals, typically composed in a mode, uncover the ways in which Monteverdi's teachers and involvements in the church influenced his compositions. However, later works such as <i>L'Orfeo</i> expose the new tonal system. Tonality, although a slow process, developed in the works of Monteverdi. As observed within this paper, Claudio Monteverdi was a key composer in the transition of music from modality to tonality in the late Renaissance era due to his background in music theory, his use of modality within the early madrigals, and his use of tonality in the opera <i>L'Orfeo</i>.</p>		

PODIUM PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Eleanor Raquet	Undergraduate Student	Music and Worship	Scholarly Debates: The Development of Early Polyphony
	<p>The records of early polyphony show development that progresses over time. How did these developments come about, and what caused polyphony to develop the way that it did? When one researches this topic, one discovers that most scholars have a different opinion on the factors that led to the development of polyphony. In this paper, I will prove that the development of early polyphony is not a simple linear process and is highly debated among scholars. Specifically, this paper examines and summarizes different scholars' opinions on the role of notation versus the oral tradition in the development of polyphony. It seems that notation and oral tradition both have a role, but scholars debate about whether polyphony developed because notation progressed, or whether the oral tradition drove the development of polyphony forward and notation simply recorded after the fact what had already happened orally. To seek to express accurately the opinions of scholars, this paper will also summarize views on whether the development of the concept of a composer as an individual contributed to the progression of notation and thus the evolution of polyphony. To accomplish this goal, I will use the method of historical documentation to discover the different opinions of scholars and compare and contrast their views. This paper will provide some clarity in future research of this complicated topic, by providing a summary of the past research in this area, so that future researchers can more clearly understand the work that has already been done, and build their work off of this knowledge.</p>		
Kelsey De Pree	Undergraduate Student	Music and Worship	Cue the Music
	<p>Music in movies has a significant impact on the viewer's perception of what is happening by providing musical cues about characters, moods, and plot foreshadowing. Movies today are a major source of American entertainment. The purpose of this paper is to attempt to show that music in movies has a large impact on the audience watching movies, and is therefore used as a device to guide emotions and foreshadow plots. The paper will attempt to prove this by answering the following questions. One: in what way is music used in movies to provide plot cues and foreshadowing? Two: how does music in movies provide musical cues about characters and their intentions? And finally, what typical musical devices (intervals, instruments, musical progression, and chords) are used to signal different movie moods and events? By answering these questions this paper will endeavor to show that music is not only an expected part of the cinematic experience but that it has become something that is integral to watching movies. Various research articles as well as audio examples were studied and analyzed to provide the basis for the statistics and examples involved in this paper.</p>		
Maria Confer	Undergraduate Student	Music and Worship	Engaging the Public with New Music: The Roles of the Public, the Composer, and the Educator
	<p>Concerning new music—when educators inform and engage the public about it, when composers are open to dialogue regarding their works, and when the public knows what to listen for—there is a higher chance of active public acceptance of new music. The tripartite relationship between the public, composers, and educators benefits from open communication and community education, in addition to each participant knowing their responsibility and contribution in the relationship. A history of this relationship since 1900, including a delineation of who and what qualifies as an “educator,” leads into a brief discussion about the future of new music in the community.</p>		
Rachel Blizzard	Undergraduate Student	Music and Worship	America's Discovery of the Arts after the Industrial Revolution
	<p>Music in nineteenth century America was greatly influenced by the Industrial Revolution and brought about changes in society through the development of concert life, the introduction of the piano in the home, and the new role women were given in music. This paper seeks to address how the middle class in America drastically changed from exposure to music. This exposure occurred through the formation of the classical concert in Europe that spread to America and promoted an awareness for the arts. It also caused more families to incorporate music into their daily lives through the growing affordability and popularity of the piano. This acceptance of the piano caused many women to gain employment and an independence that prior to this time had not been seen. Overall, it can be seen that American life today was shaped by the heavy emphasis of music throughout the nineteenth century.</p>		
Catherine Milliron	Undergraduate Student	Music and Worship	Next Time Won't You Sing with Me? The Role of Music Rooted in Oral Tradition as a Resource for Literacy Learning in the Twenty-First Century Classroom
	<p>Most children learn music by rote long before they begin to learn by note. Early music learning is often facilitated through the oral transmission of music – a practice that has existed since long before the emergence of standardized music notation. Orality has long been linked to literacy and the relationship between the two – both in the past and in the present – has been studied in depth by modern scholars. Although it could be supposed that the innovation of music notation has negated the necessity for oral music transmission, in reality the two music transmission methods work in tandem in modern-day music education. Oral tradition is far from dead, and this is illustrated in folk tunes, nursery rhymes, and traditional songs. Many of these songs, from “Mary Had A Little Lamb” to the “Alphabet Song” to “Ring Around the Rosie,” are rarely taught to children with the aid of sheet music. They are most commonly passed down from one generation to another simply by rote and have been kept alive solely by oral transmission. These timeless songs provide an excellent springboard for music educators, as they contain valuable teaching topics in the areas of language and literature, allude to various historical events and geographical locations, and provide meaningful instruction on how students are to interact with the world in which they live. Since there is such a strong link between orality and literacy, my research seeks to assert that music rooted in the oral tradition should play a central role in the modern early childhood music classroom because it increases students' language literacy, historical knowledge, and social awareness.</p>		
Deborah Longenecker	Undergraduate Student	Music and Worship	The Partimento Tradition in the Shadow of Enlightenment Thought
	<p>This presentation investigates the relationship between partimento pedagogy and Rameau's music theories as influenced by Enlightenment thought. Current research on partimento has revealed its importance in Neapolitan music schools of the eighteenth and nineteenth centuries. Along with counterpoint, partimento was a core subject in the study of composition in the Neapolitan schools; however, as pedagogy and theory began to be influenced by Enlightenment ideals such as the scientific method or a preference for clear systemization, the partimento tradition began to wane. In this presentation, I examine Rameau's music theory as an example of Enlightenment thought in music, juxtaposing the central ideals of Rameau's music theory with the ideals of partimento pedagogy and suggesting that Enlightenment thought hastened the decline of partimento study. Both the method of partimento pedagogy and Rameau's theory of the fundamental bass stemmed in part from the practice of thoroughbass, and both were viewed as effective ways to teach musicians composition and improvisation. However, Rameau's theory sought to improve on existing pedagogies by condensing eclectic rules and extended study into a few fundamental principles—an example of Enlightenment thought applied to music theory. In the light of Rameau's understandable, widely applicable theory of harmony based on Enlightenment assumptions, the long years of practice-based partimento study under a maestro gradually became obsolete. The research methodology of this presentation consists of historical research from primary and secondary sources.</p>		

PODIUM PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Josiah Kenniv	Undergraduate Student	Music and Worship	Russian Music from 1917-1953
	This research focuses on Russian musical life in the Soviet Era, beginning in the Bolshevik Revolution in 1917, to the death of the Joseph Stalin in 1953. Much of the information is taken from books written by Russian authors who attempt to explain this massive cultural and political change from the perspective of both the artist and the everyday citizen in Russia. The purpose of this project is to show how governmental reforms changed musical life in Russia, and how composers and performers alike adapted to that change.		
Michael Sprague	Undergraduate Student	Science and Mathematics	Understanding Feathered Dinosaurs
	Young-earth creationists hold to separate creations of birds and land animals due to a literal interpretation of Genesis 1:20-25, which describes their creations on different days. As such, they oppose the conventional model of theropod-to-bird evolution. For many years, there were few Mesozoic birds known, namely Hesperornis and Ichthyornis. Specimens such as Archaeopteryx, found in 1861, seemed to strengthen the argument for the proposed transition. However, even after John Ostrom reinvigorated the idea of dinosaur-to-bird evolution in 1960 with the discovery of Deinonychus, evidence of this transition was still sparse. In the 1990's, exquisitely-preserved dinosaur fossils began to pour out of Liaoning Province, China sporting feathers and several feather-like filaments. Typical creationist responses to feathered dinosaur fossils include 1) denying that they are real fossils, 2) assuming that "dino-fuzz" is something other than integument, or 3) arbitrarily calling some fossils birds and others dinosaurs. Some creationists believe that no feathered dinosaurs have been found, despite there being evidence of feathers in most families within Theropoda.		
Adam J. Hammett Nathan A. Harold Tucker R. Rhodes	Faculty, Undergraduate Students	Science and Mathematics; Engineering and Computer Science	Does logic help us beat Monty Hall?
	The classic Monty Hall problem consists of a hypothetical game show contestant being presented three doors and told that behind one door is a car and behind the other two are far less appealing prizes, like goats. The contestant then picks a door, and the host (Monty) is to open a different door which contains one of the bad prizes. At this point in the game, the contestant is given the option of keeping the door she chose or changing her selection to the remaining door (since one has already been opened by Monty), after which Monty opens the chosen door and the contestant wins the prize which lies behind it. Inspired by the work of Morrow, Oman and Salminen (2016, "Game Show Shenanigans: Monty Hall Meets Mathematical Logic," Elemente der Mathematik 71(4), pp. 145-155), we consider several logic-themed variants of this problem. Among these are versions where d doors and p prizes reside behind some p of these doors, and the contestant is permitted to present Monty with q random true/false questions concerning the location of the prizes, to which Monty must respond truthfully. Our results extend those of the original paper, and involve a combination of probabilistic techniques and exhaustive computation using a computer program.		
Holly Robison Teara Caston Leane Ewert Jessica McDonald Emily Crabb	Undergraduate Students	Social Work	Women's Rights Violations in Prison
	The goal of this presentation is to conduct research and educate others about the women's rights violations experienced by incarcerated women. We are proposing to address three specific women's rights violations present within American, Russian, and Brazilian correctional facilities. We chose these countries because, according to research, the US, Russia, and Brazil are among the top five countries with the highest number of female inmates. First, we will discuss world statistics about female incarceration and general information about female penitentiaries in the US, Russia, and Brazil. Second, we will discuss physical and sexual abuse present within these correctional facilities. Third, we will discuss health violations, specifically those experienced by pregnant inmates. Fourth, we will highlight the disconnection to children and parenting that female inmates experience. Lastly, we will present strategies that can be employed by social workers to address the above women's rights violations, including a Biblical perspective on this issue. In doing so, we hope to provide applicable knowledge for social workers and other individuals in the community.		
Jesse A. Childress Ashley Hand Lauren Pullins Emily Rutherford Michelle Tye	Undergraduate Students	Social Work	The Cyclical Relationship between Generational Poverty and Poor Education: Breaking the Barrier in Haiti
	Research demonstrates that generational poverty and poor education are cyclical in nature. In Haiti, poverty diminishes the quality of education due to the fact it hampers access to education, lacks parental involvement, and has inadequate health care. Conversely, poor education traps Haitians in the cycle of generational poverty by inhibiting them from developing life skills and adequate literacy; in turn, this hinders them from participating in higher paying jobs. Based on the repetitive correspondence between the two, our goals are: to educate individuals on the cyclical relationship between poor education and generational poverty; to expose and examine the barriers to receiving an education; and suggest ways to overcome the barriers to education federally and individually.		
Charlotte Lively Sarah Platenga Kennan Schwartz Alysia Bey Emilie Delgado	Undergraduate Students	Social Work	Unethical Business and Fair Trade
	The goal of this presentation is to educate others about the impact of America's businesses on the global community. We will do this by first discussing the history of foreign trade in America, highlighting the exploitative characteristics of our international business for decades. From here, we will move into four specific industries that consume American life and the ways they violate social, environmental, and economic justice worldwide. These four industries include: the fashion industry, the pharmaceutical industry, the oil industry, and the food industry. We will end our presentation by challenging our audience to think about the spirit of consumerism that exists in America, and the ways in which this affects their buying. With this, we will offer examples of businesses that create products ethically, and encourage our listeners to become more aware and conscientious of the products and businesses they support.		

PODIUM PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Rebecca A. Simpson Kelley M. Vernon Daniel C. Marquez Kylie A. Corbett Breanna L. Bishop	Undergraduate Students	Social Work	Foreign Aid
<p>The goal of this presentation is to explain our research regarding foreign aid. We will present how foreign aid is received in three different regions of the world in the nations of Russia, Afghanistan, and Haiti. First, we will define foreign aid by reviewing its history compared to how it is practiced today. We will also look at why the United States initially decided to provide foreign aid to the referenced countries, but how the original intent actually caused issues and concerns within these countries and provided little to no actual help. In addition, we will expose the problem of dependency the discussed countries have on the United States due to the current process of foreign aid. Lastly, we will present four questions to ask when researching the best methods of cross-cultural aid, and a suggested call to action. By reviewing the different aspects of foreign aid, we hope to educate our audience on ways it can either weaken or empower receiving countries.</p>			

POSTER PRESENTATIONS

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Julian Pernia James Von Eiff Colin Broberg Tyler Drake	Undergraduate Students	Engineering and Computer Science	CedarLogic 2.0 Update
<p>CedarLogic is Cedarville University's student-developed, digital logic simulator. Engineering and Computer Science students use this software for several of their classes. Our primary goal for this update is adding black boxes, buses, and cross-platform compatibility. Our additional improvements in user-friendliness and functionality will give students an improved CedarLogic experience.</p>			
Michael D. Baxter Grant W. Dennison Abigail M. Riffle Noah W. Bragg Andrew D. Lockridge Robert J. Jacubec	Undergraduate Students	Engineering and Computer Science	The Bible Story Producer App
<p>The Bible Story Producer team at Cedarville University has been spending the past year on the Bible Story Producer app for Android. This app is a tool whose purpose is to facilitate the translation of Bible stories by bilingual laypersons in places where the Bible is unavailable in the vernacular. The aim of the app is to facilitate the oral translation of Bible stories transmitted as templates consisting of voice narration in a Language of Wider Communication (LWC). The narration is accompanied by a series of high-quality illustrations animated by the Ken Burns (pan and zoom) effect. An instance of oral translation may not involve writing down the translated words since some languages do not yet have an alphabet. Field testing has, so far, shown the controversial notion of oral translation to be effective. In our presentation, we will discuss the translation process that our client introduced to us as well as different implementation decisions that went into making the app.</p>			
Jackson W. Volante Kidron Filbrun Jeffrey T. Deane Andrew T. Carr Nathan Harold Daniel Eckley	Undergraduate Students	Engineering and Computer Science	Augmented Reality Technician Assistance Program
<p>The Augmented Reality Technician Assistance Program is a proof-of-concept project for allowing a remote expert to communicate with and assist a field technician in completing procedures with which the technician may be unfamiliar. For example, an expert in Navy aircraft maintenance could advise an Air Force flight mechanic about performing repairs or maintenance on Navy aircraft. The end goal of our Cedarville computer science capstone project is to create an experimental prototype to deliver to the Air Force Research Laboratory. In our prototype the expert uses a Microsoft Surface Pro tablet to communicate via marked up still images with a HoloLens-enabled field technician. As a wearable computer, the HoloLens provides the technician a hands-free advantage over traditional devices, because its interface does not use typical input devices such as a mouse and keyboard. The advantage of the Surface Pro is that it allows the expert to mark up instructional images naturally with the stylus, providing better precision for the annotations.</p>			
Joe Morin	Undergraduate Student	Engineering and Computer Science	An Electrochemical Analysis of Fretting Corrosion in Metal-on-Metal Hip Implants subjected to High Impaction Loads

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
	<p>The metal-on-metal total hip arthroplasty, a procedure where the hip joint is replaced by a femoral prosthesis with a metal femoral head and a metal socket, has been a popular option for patients requiring a hip joint replacement. Metal on metal hip implants have been a successful implant design until recently where there has been an increased number of failures of this type of implant due to fretting corrosion, believed to be caused by the use of large femoral heads. Fretting corrosion in hip implants results from cyclic micromotion at the taper-trunnion interface; this interface motion removes the protective oxidation layer from the metal allowing the fluid environment of the body to react with the metal and ultimately leads to the release of metal ions into the surrounding tissue and bloodstream. The objective of this research is to quantify the amount of fretting corrosion at the taper-trunnion interface after a static load of 991 lbs. is applied, and compare results to a previous study where 450 lbs. impaction force was applied. For both studies all specimens are cyclically loaded between 10 lbs. and 460 lbs. while fretting corrosion data is collected. Fretting corrosion was characterized through the implementation of an electrochemical experiment in order to measure the amount of metal ions released from the implant during loading, which is directly correlated to the amount of fretting corrosion. Results of this study will elucidate the importance of impaction load in the process of fretting corrosion at the metal taper-trunnion interface.</p>		
Joe Morin Michael Pickett Amy Abraham	Undergraduate Students	Engineering and Computer Science	3D Printing of Biodegradable Scaffolds for Tissue Engineering Applications
	<p>With the recent improvements in three dimensional (3D) printing technologies, the potential for tissue engineering and regenerative medicine have significantly improved. One key idea in tissue engineering is to specifically design scaffolds to aid in the healing process by being incorporated into the body's own tissue. The overall goal of this project is to investigate 3D printable scaffold design to access suitability for tissue replacement. This was accomplished by analyzing the effect of the material used to create the scaffolds, pore size, and pore shape on mechanical stiffness and cell culturability. Based on published literature, it was determined that, depending upon the desired tissue type, the best pore shapes are circles, squares, and hexagons. This study focused on designing numerous scaffolds by varying the parameters listed above, and then printing 3D biodegradable (PLA & TPU) scaffolds to be cultured, mechanically tested and evaluated. The scaffolds were cultured with endothelial cell lines to ensure cell survivability on the 3D printed material. After cell culturing protocol, cell attachment and viability were assessed and cell density recorded. The mechanical tests were performed using a standard tension test machine in order to gather stiffness and strength data. By analyzing our results, we will be able to make recommendations regarding which pore shape, size, and porosity will yield the most anatomically compliant results for the desired tissue.</p>		
Nicole D. Perez Wesley Kelly Jonathan Easterday Todd Landis	Undergraduate Students	Engineering and Computer Science	CUSigns
	<p>Cedarville University has computer monitors located throughout campus in order to show advertisements and important information to students, faculty, and staff. The slides shown on these displays are scheduled using Concerto: web-based software which manages digital signage. Though the Concerto software is currently used to manage digital signage, Cedarville University's IT department desires features which Concerto does not provide, including the ability to play videos, a better slide randomization algorithm, emergency broadcasting features, and an intuitive user interface. We have created a new solution for digital signage called CUSigns with the goal of providing the existing functionality of Concerto while also providing the additional features. Numerous in-depth interviews with members of Cedarville's faculty and staff who are currently using Concerto have led to cycles of design and redesign allowing CUSigns to meet the user requirements necessary to replace Concerto. CUSigns is currently in Beta testing on three displays in the Engineering and Science building to ensure system stability as it is prepared to be released for widespread use at the end of April.</p>		
Clara G. Hendrickson Joshua D. Pearson Brice J. Montgomery Natalie M. Lien Marcella B. Moorman Anna T. Kaster Elizabeth J. Carraher Annis N. Shaver	Faculty, Undergraduate Students	English, Literature, and Modern Languages	Identifying Elements of Kinder- und Jugendliteratur
	<p>Kinder- und Jugendliteratur, children's literature written for the purpose of teaching or entertaining young people, has been present in German literature since the Middle Ages. This genre has changed as German literature progressed, reflecting the developments of each era, including such periods as the Romantic, the Biedermeier, Realism, Modernism and Postmodernism. As such, we examined individual works of German Kinder- und Jugendliteratur for the purpose of identifying distinctive features which situate them within children's literature as well as in the respective historical genre. The works examined were <i>Nußknacker und Mausekönig</i> (1816) by E. T. A. Hoffmann, <i>Emil und die Detektive</i> (1929) by Erich Kästner, <i>Försters Pucki</i> (1935) by Madge Trott, <i>Jan und das Wildpferd</i> (1957) by Heinrich Denneborg, <i>Die Wolke</i> (1987) by Gudrun Pausewang, and <i>Tintenherz</i> (2003) by Cornelia Funke. We present our findings in the form of a <i>Wimmelbuch</i>, a typical form of German Kinder- und Jugendliteratur made popular during the Biedermeier period of the mid-1800s.</p>		
Michael B. Retzlaff Timothy C. De Jong Timothy Parrott	Undergraduate Students	Kinesiology and Allied Health	Acute Effects of Non-Nicotine Vaping on VO2 Max, Blood Pressure, Heart Rate, and Lung Volume
	<p>Finding a healthy alternative to tobacco smoking has been a topic of interest to health physicians and smokers for many years. Vaping is an increasingly popular smoking alternative that claims to be the healthier alternative that people have been looking for. However, little research has been done on the topic of non-nicotine vaping. This study examines the acute effects of non-nicotine vaping on predicted VO2 max, blood pressure, heart rate, and lung volume. The study will be conducted through a series of 5 days which includes a paperwork day. Willing participants will run the Cooper's Mile and a ½ Test, and vape while having bodily measures taken throughout the study. This study aims to find a better understanding of vaping and the effects it has on the human body.</p>		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Grace A. Miorelli Michaela Nelson Elizabeth A. Sled Benjamin T. Massa Mackenzie J. Clemens Hope E. McColl April D. Crommett	Faculty, Undergraduate Students	Kinesiology and Allied Health	The Effects of Square-Stepping Exercise on Risk of Falling and Balance in Senior Adults
<p>As people age, their body systems gradually deteriorate. Muscle function and the vestibular system slowly deteriorate leading to lower body instability. Older adults who struggle with dizziness and imbalance are more prone to falling. Dizziness and imbalance cause falls, and falls are the leading cause of hospitalization and accidental death in older adults (Shinichi & Tatsuya, 2015). It is possible to prevent and reduce the risk of falls through balance training. It is crucial that older adults take the steps needed to improve their balance and therefore reduce their risk of falling. PURPOSE: To evaluate the effect of a 10-week Square-Stepping Exercise (SSE) program in older adults using the Biodex balance system. METHODS: Eleven adults over the age of 60 and involved in the Senior Jacket program at Cedarville University participated in this 10-week study (0 males, 11 females; mean age=76). Measurements taken prior to and after the intervention include Activities-specific Balance Confidence (ABC) Scale, Timed-Up-And-Go Test, 30-Second Chair Stand Test, Limits of Stability Test, and Fall Risk Test. A Repeated Measures ANOVA was used to determine changes in initial and final balance testing scores. RESULTS: The study revealed that significant differences were found for the functional fitness tests. SPSS indicated a significant difference in improvement from pretest to posttest for the Timed-Up-and-Go Test ($P = .003$) as well as the 30-Second Chair Stand Test ($P = .043$). For the Limits of Stability test, there was no significant change from pretest to posttest for the overall ($P = 0.162$) or any of the 8 directions. The Fall Risk Test score also showed no significant change ($P = 0.831$). The ABC Scale test did not show significant improvement either ($P = 0.995$). CONCLUSION: Overall, the results showed that the participants significantly benefited from the training program in areas of functional fitness. Unfortunately, there was no significant improvement with the Biodex balance system's Fall Risk Test or Limits of Stability Test. Results may be due to the participants already having good balance as they were well below the normative data for risk of falling. It could also be because the training was not specific enough for improvements in the Fall Risk and Limits of Stability tests.</p>			
Miriam J. Morris Bernadette F. Rowe Jessica L. Stauff	Undergraduate Students	Nursing	The Effectiveness of Cognitive Behavioral Therapy on Management of Symptoms in Rheumatoid Arthritis Patients
<p>Objectives: To carry out a systematic review of literature examining the effectiveness of cognitive behavioral therapy (CBT) alongside pharmacological treatment of rheumatoid arthritis (RA) symptoms compared to pharmacological treatments (standard care) without CBT.</p> <p>Methods: The Iowa Model of Evidence-Based Practice to Promote Quality Care was used as the theoretical framework for this review of literature. Databases utilized: CINAHL, OneSearch, PubMed, and MedLine. The inclusion criteria for this search were: CBT as an intervention, articles published within 2006-2016, and English full text articles.</p> <p>Exclusion criteria were: participants less than 18 years of age, interventions other than CBT, or any other type of arthritis that was not RA. Out of 96 articles found, 10 were included in this review of literature.</p> <p>Results: Out of the 10 articles chosen for this review, included were: 51 randomized controlled trials, 31 studies, 47 transcripts, and 5,345 participants. In seven articles pain and depression symptoms showed improvement with CBT; six articles showed fatigue and physical activity improved. However, only one demonstrated evidence that CBT improved anxiety symptoms.</p> <p>Conclusion: This review of literature focused on how CBT in combination with standard care for RA (pharmacological therapy) would affect symptom management. Evidence suggests that CBT is an effective treatment intervention alongside pharmacological therapy on management of symptoms in RA. Research evaluating the long-term effects, overall quality of life, and maintenance therapy related to CBT should be explored further.</p>			
Ryley B. Uber	Graduate Student	Pharmaceutical Sciences	Employing "FDALabel" Database to Extract Pharmacogenomics Information from FDA Drug Labeling to Advance the Study of Precision Medicine
<p>Pharmacogenomics (PGx) focuses on how genomics and genetic variants (inherited and acquired) affect drug response. A better understanding of the association between genetic markers and individual phenotypes may improve therapy by enhancing drug efficacy, safety, and advance precision medicine. The FDALabel database (https://rm2.scinet.fda.gov/druglabel/#simsearch-0) was developed from the FDA's Structured Product Labeling (SPL) repository to allow users to perform full-text and customizable searches of the labeling section (e.g. Boxed Warning, Warning and Precautions, Adverse Reaction (AR) sections). In this study, 48 known biomarkers were used to query PGx relevant contents from the FDALabel database, including Indication, Clinical Pharmacology, Clinical Studies, and Use in Specific Populations. As a result, we identified 162 drugs out of 1129 small molecule drugs with PGx biomarker information. Furthermore, statistical analysis, pattern recognition, and network visualization were applied to investigate association of drug efficacy and severe ARs with PGx biomarkers and subpopulation. The results indicated that these drugs have a higher association with certain ARs in specific patient subpopulations (e.g., a higher association between CYP2D6 poor metabolizers and ARs caused by drugs for the treatment of psychiatric disorders), and cover a broad range of therapeutic classes (e.g., Psychiatry, Cardiology, Oncology, and Endocrinology). FDALabel database (free publicly available) provides a convenient tool to navigate and extract PGx information from FDA-approved drugs. The knowledge gained from these drugs and biomarkers in this study will enhance the understanding of PGx to advance precision medicine.</p>			

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
April Filter Stacy Lin Sydney Schultz Rachel Anderson Tori Twinem Denise Simpson Melissa Beck	Faculty, Graduate Students	Pharmaceutical Sciences	Correlation Study: Student Success in Biochemistry as a Prerequisite for Integrated Pharmacology and Medicinal Chemistry
	<p>A rise in new schools of pharmacy has led to implementation of new curriculums. Pharmacy schools must adhere to standards set by the Accreditation Council of Pharmacy Education in order to provide knowledge of foundational sciences and prepare pharmacy students for the future. Prerequisites are typically foundational science courses taken early in the program so that students have the knowledge necessary to be excellent pharmacists. Within the Cedarville University School of Pharmacy, Biochemistry is a prerequisite course for Integrated Medicinal Chemistry and Pharmacology (PcoMedChem). The goal of this study is to determine if Biochemistry should remain a prerequisite course for Integrated Medicinal Chemistry and Pharmacology at Cedarville University under a TBL setting based on if student success in Biochemistry influences student success in PcoMedChem. The study will evaluate student individual and overall course grades for both Biochemistry and PcoMedChem. The data will include grades from the 2018-2021 cohorts of pharmacy students. Inclusion criteria consists of completion of Biochemistry and Integrated Medicinal Chemistry and Pharmacology. No exclusion of students exist because all student data will be evaluated. Students will complete a survey through Qualtrics regarding extracurricular commitments as well as perceptions towards the courses to supplement the findings and explain discrepancies. The demographics and students' perceptions will be compared in SPSS by analyzing frequency of responses. Using SPSS, the Wilcoxon test and Levene's test will be conducted followed by a Pearson or Spearman correlation, depending on distribution, in order to determine correlation between grades in Biochemistry and PcoMedChem. Additionally, an ANCOVA test will be used to analyze the data gathered from our survey. A p-value of 0.05 will be indicative of statistical significance.</p>		
Danielle E. Baker Colin Behm Bryan Feldmann Jeremy Flikkema Thaddeus Franz	Faculty, Graduate Students	Pharmacy Practice	Patients' Perceptions of Pharmacist Intervention Through Pre-Screened Medication Therapy Management Service
	<p>Background: The continued challenge of time commitment in a community pharmacy setting is reported by pharmacists as the single largest setback in providing quality patient care. Additionally, when efforts are made by pharmacists to intervene on a patient's therapy through medication therapy management (MTM), patient "no shows" further challenge an already busy community pharmacy world. Many studies show the value of a pharmacist-patient relationship. However, continued barriers prevent the value of this relationship taking full effect. While numerous methods of comprehensive medication review take place, the issue of establishing a model that best suits the needs of community pharmacy patients still exists.</p> <p>Statement of the Problem: To assess patients' perceptions of pharmacist intervention through a pre-screened medication therapy management service at prescription pick-up.</p> <p>Description of Methodology: This study utilized a nonprobability convenience sampling of MTM participants at a local community pharmacy pickup for research. A questionnaire was designed to assess patients' perceptions prior to and after the pharmacist intervention. All adult patients willing to participate in MTM services were included. After the MTM intervention, participants were encouraged to complete the questionnaire at home and mail it back to the pharmacy. The questionnaires were then collected from the pharmacy for review and data was analyzed with SPSS software.</p> <p>Results: Reported increased patient satisfaction and knowledge by survey following the MTM intervention. Unfortunately, the results were insignificant and the study did not achieve ideal power.</p> <p>Conclusions: The descriptive statistical results enumerated in this study do not reveal any applicable trends relating to the use of MTM services at-large. Despite these findings, however, all patients who commented on the intervention provided positive feedback. Further research is encouraged to appropriately assess the value of pharmacist-delivered MTM at prescription pick-up.</p>		
Taylor E. Hobbs Aubrey Gillette Hannah Grammer Michael Firmin	Faculty, Undergraduate Students	Psychology	Developmental Results of Military Kids' Upbringing: A Qualitative Analysis
	<p>In the present qualitative study, researchers focused on the similarities among college-aged military kids due to similar upbringings and shared experiences. The study was conducted through semi-structured interviews in which participants were asked to draw conclusions between past experiences and present attitudes. Researchers found major themes during the interviews and the themes of military pride, respect, and acculturation are the focus of the current presentation.</p>		
Cindy Cheung Siu Nikki Tiffan Jean-Luc Schieferstein Samantha Kohli Ruth Markham	Faculty, Undergraduate Students	Psychology	Phone Home: Parent-Child Support In College Students' Social Interaction
	<p>In this qualitative research study we explored college students' understanding and appreciation of parental support in social interaction. We conducted semi-structured interviews with 20 college students who were found to have a close relationship with their parents from a previous study (relative to their peers). The first theme indicated that the majority of these students, who already have close relationships with their parents, benefitted from verbal communication, including phone calls and texting with their parents. Texting enables the students and parents to remain in constant contact with each other throughout the day. Parents are able to encourage their children, and let them know they are being thought of and prayed for. They are also able to send reminders about important events, responsibilities, and daily encouragement. Phone calls are another form of communication that was reported. These calls enabled parents to hear about their child's life, specific stressful events, and personal conflicts in a more detailed way than texting. The second theme revealed that participants also were grateful for their parents' availability, giving them a sense of support and security. The students commented that they feel loved and important as a result of being a high priority for their parents. The parents' consistent communication with their child also served as a morale and self-esteem boost. The last theme represented how students use their parents as a source of relief. When students are on the phone with their parents, the student will often fill in the details and emotions about a conflict and the parent can then provide a safe place for the student to process their thoughts.</p>		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Michael W. Firmin Kristin DeWitt Lauren A. Kuhlwein Heidi M. Gibbs Nicole M. Tiffan	Faculty, Undergraduate Students	Psychology	Clinical Differences Between the APA and NASP Ethical Codes
	We present the results of a research study comparing the American Psychological Association's (APA) and the National Association of School Psychologists' (NASP) ethical codes. Overall, 58 differences exist between the two codes and, in the present poster session, we focus specifically on the 25 differences relating to clinical issues. These include three differences pertaining to documentation, six referring to assessment practices, and 17 differences relating to clinical practice. Implications are discussed for school psychologists working within schools, or in private practice, psychologists in clinical practice, and students deciding between these career paths. Overall, psychologists under the APA code of ethics have stricter rules to follow regarding test construction, security, and interpretation. NASP either does not acknowledge or does not elaborate on these items and such differences potentially affect the day-to-day activities of a psychologist administering tests under the APA code of ethics as opposed to the NASP ethical code.		
Michael Firmin Kristin DeWitt Reina Soczka Heidi M. Gibbs Alyssa M. Massaro	Faculty, Undergraduate Students	Psychology	State Licensure Board Requirements Pertaining to Moral Turpitude
	State licensure board laws showed highly ambiguous and/or no clear definitions regarding moral turpitude requirements for state psychologist licensure. Contact with respective state boards showed no licenses to have been recently denied due to poor moral character. We call for a national examination and clear rubrics for defining moral turpitude.		
Michael Firmin Ruth Markham Heidi M. Gibbs Lauren A. Kuhlwein Nicole M. Tiffan	Faculty, Undergraduate Students	Psychology	A Qualitative Analysis of the Motivation and Affiliation Dynamics Involved with a Firefighting Career
	We explored the experience of a full-time firefighting career in this phenomenological qualitative study. We conducted 26 semi-structured interviews with 26 male full-time firefighters regarding their personal constructs of motivation and affiliation. Under the construct of motivation, three themes emerged. First, firefighters were motivated by a love of the excitement firefighting provides. Second, firefighters reported the schedule allowing them more time at home was a motivation. Third and most emphasized by the firefighters, was an altruistic motivation to help others. Under the construct of affiliation, the firefighters reported a strong sense of brotherhood with their shift-partners and extended this brotherhood to all firefighters and even other emergency workers. We relate these findings to the existing body of research regarding the relationship between motivation and affiliation and satisfaction of firefighters.		
Michael W. Firmin Ruth L. Markham Nicole Tiffan Heidi Gibbs Lauren Kuhlwein	Faculty, Undergraduate Students	Psychology	Personal Frustrations of a Full-Time Firefighting Career
	In this phenomenological qualitative study, we explored the professional and personal frustrations of being a full-time male firefighter. Themes emerged through analyzing the transcripts of the 26 semi-structured interviews that we conducted. Questions specifically focused on the stress and experiences encountered while on the job and the potential effects that their job has on their personal life, including hobbies, health, and personality. Themes included perceived verbal and physical abuse by the community of the fire service and its services, firefighters' increased awareness of the environment and how this affects their daily life and the negative/positive implications of the media portrayal of firefighters. We relate the findings of the present study to research on other service-providing professions. Implications of the study include increased awareness and respect for the struggles firefighters endure.		
Rachel D. Cordle Anna Forcelle	Undergraduate Students	Psychology	How Athletics Affect an Athlete's Academic Performance
	Involvement in both a collegiate sport and education can be overwhelming and stressful and has the potential to result in sacrificed educational advancement and attainment. Due to the lack of research done concerning this topic, limited knowledge is known regarding specific stressors encountered by athletes and their coping strategies used. As a result, there is little understanding about how to best support college-level student athletes. Therefore, the purpose of this study is to gain insight from university students as to how athletics affect their academic performance, and to battle against the stereotype of college athletes being average or just below average in their studies. Surveys and twenty minute interviews with thirteen Cedarville University Varsity female athletes were conducted. Data collection was analyzed revolving around the overarching subjects of: time-management, self-discipline, self-care involving sleep habits, responsibility, postgraduate athletic plans, values, and social skills. Overall, the trends highlight that athletes appreciate the structured schedule and have found the balancing to be beneficial towards their educational attainment. Athletes report that their sport has helped motivate them in their studies.		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Thomas A. Sackett Jacqlyn A. Fletcher	Undergraduate Students	Psychology	Perceptions of Homeschooling: A Qualitative Study of the lives of Homeschool Parents
	We conducted a qualitative research study on the lives of homeschool parents. We interviewed 24 parents who have either homeschooled their children in the past or were currently homeschooling at the time of the study, regarding constructs such as success of homeschooling and the effects homeschooling has had on the personal lives of the parents. Several themes emerged from the study's data. One theme was the feeling of homeschooling being a success in comparison to traditional education. They shared accounts of bonding with their children and being able to set the curriculum speed just right for their children. The second theme is the social stigma homeschooling had in their respective communities. The participants shared how there were instances of people thinking homeschool parents were weird, but they found support in homeschool support groups or in their religious communities. Third is the cost of time and resources. The participants continued to mention time management as a cost and that finding/purchasing the right resources was a struggle. We relate the findings to literature regarding broader topics, such as reasons for homeschooling, the parents' social lives, and the impacts homeschooling has on families.		
Felisha L. Younkin Elizabeth A. Axtell Chelsea R. Anderton	Faculty, Undergraduate Students	Psychology	Stress and Sleep Quality: Mediating Effects of Social Support
	Stress is defined as the "nonspecific response of the body to any demand made upon it" (Kohn & Frazer, 1986). Stress is among the top five threats to academic performance among college students (Pettit & DeBarr, 2011). The purpose of the study was to investigate whether stress affects perceived sleep quality, as mediated by social support, and to determine whether stress levels vary based on academic major. Using ANOVA in SPSS 24, we tested three hypotheses: stress and sleep quality are negatively correlated; social support mediates the relationship between stress and sleep quality; and stress levels will vary by academic major (specifically that science, technology, engineering, and mathematics majors will show greater perceived amounts of stress). Results of this study show that there is positive correlation between sleep and stress, a negative correlation between social support and sleep, and a negative correlation between stress and social support.		
Jessie D'Amico Sarah E. Taylor Beth Hansford	Undergraduate Students	Psychology	The Lonely Scroll: The Impact of Social Media on Loneliness in Introverts and Extroverts
	This study examined the impact that social media had on feelings of loneliness in introverts and extroverts. Each participant received a survey based off of the NEO Personality Inventory, the UCLA Loneliness Scale and the Internet Behaviors Scale. The survey aimed to assess the relationship between social media and feelings of loneliness on different personality types. Social Media is a prevalent aspect of modern day culture. Therefore, this study aims to teach individuals how to prevent social media from negatively affecting them. The results supported our hypotheses that both loneliness and internet use, as well as personality type and loneliness, are statistically significant.		
Ashley M. Belles	Undergraduate Student	Psychology	Relationship Quality of Siblings Attending the Same University
	This phenomenological qualitative study explores the relationship quality of siblings who both attend Cedarville University. This study seeks to identify commonalities and key components to close sibling relationships. The desire to attend the same school, or remain close to a sibling was explored, as well. Questions specifically focused on family life growing up, and current family life, while attending Cedarville University. These questions were designed to gain background information, while also gaining insight to current relationship quality and conflict. Some themes that have emerged are similarities in sibling roles based on birth order, and influencing each other in making morally sound decisions. A majority of the conflicts encompassing sibling relationships were linked to family issues and disagreements about morality. Most sibling pairs had maintained a strong relationship with his or her sibling previous to attending the same university, which essentially facilitated the relationship at Cedarville University.		
Carissa Slone	Undergraduate Student	Science and Mathematics	Models of Nation-Building via Systems of Differential Equations
	Nation-building modeling is an important field of research given the increasing number of candidate nations and the limited resources available. A modeling methodology and a system of differential equations model are presented to investigate the dynamics of nation-building. The methodology is based upon parameter identification techniques applied to a system of differential equations, to evaluate nation-building operations. Data from Operation Iraqi Freedom (OIF) and Afghanistan are used to demonstrate the validity of different models as well as the comparison of models.		
Sarah C. Rouse	Undergraduate Student	Science and Mathematics	Characterization of Massive vs. Laminated Texture of the Coconino Sandstone (Permian), Arizona from the Study of Thin Sections
	This project seeks to contribute to the work of Dr. John Whitmore and Sarah Maithel on the Coconino Sandstone (Permian) of Arizona. More than one hundred thin sections are available for study from this sandstone. Each thin section was examined both macroscopically and microscopically to determine if the sample is "laminated" or "massive." The purpose of this project is to define what "laminae" are and then develop reliable quantitative criteria that can differentiate between the laminated and massive samples. These criteria might then be applied to distinguish patterns that occur across the deposit, which in turn may provide insight into the depositional conditions of the sandstone. The thin sections were visually examined to differentiate between compositional and textural lamination, as this study focused on textural characteristics. Dr. Whitmore provided data that was collected through the measurement of 400-600 randomly selected grains within each thin section. Statistical analysis of rounding, grain size, and sorting data suggested that sorting is the primary characteristic that causes lamination. While sorting data cannot provide a definitive classification of "massive" or "laminated" for individual thin sections, it can substantiate visual characterizations and support regional trends. For example, the outcrops in this study appear to be grouped into poorly sorted in the north and more moderately sorted further south. This indicates a change in the depositional environment which is probably related to a decrease in velocity. Collectively, sorting data along with visual inspection can be used to draw conclusions about the laminated or massive nature of an outcrop and can contribute to an understanding of depositional conditions.		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Jennifer N. Felzien Brandon R. Kalb Bethany C. Khol Katelyn R. Malik Matthew S. Mercial Lois Parks David F. Paulding Shannon N. Rappaport Kenneth W. Ward Heather G. Kuruvilla	Faculty, Undergraduate Students	Science and Mathematics	Netrin-3 Peptide (C-19) is a Chemorepellent and a Growth Inhibitor in <i>Tetrahymena thermophila</i>
	<p>The netrins are a family of signaling proteins expressed throughout the animal kingdom. Netrins play important roles in developmental processes such as axonal guidance and angiogenesis. Netrin-1, for example, can act as either a chemoattractant or a chemorepellent for axonal growth cones depending upon the concentration of the protein as well as the cell type. Netrin-1 acts as a growth factor in some mammalian cell types and is also expressed by some tumor cells. Netrin-3 appears to share some signaling apparatus with netrin-1, but is less widely expressed, and its physiological roles are much less understood. Netrin-3 is also used as a biomarker for some cancers as well as traumatic kidney injury.</p> <p><i>Tetrahymena thermophila</i> are free-living, eukaryotic, ciliated protozoas used as a model system for studying chemorepellents and chemoattractants because their swimming behavior is readily observable under a microscope. We have previously found that netrin-1 peptide acts as a chemorepellent in <i>Tetrahymena thermophila</i> at concentrations ranging from micromolar to nanomolar. However, netrin-1 peptide does not affect growth in <i>Tetrahymena</i> at these concentrations. In our current study, we have found that related peptides, netrin-3 peptide (H-19 and C-19; Santa Cruz Biotechnology), act as chemorepellents in <i>Tetrahymena thermophila</i> at concentrations at or below 1 mg/ml. The same concentration of netrin-3 peptide reduces growth of <i>Tetrahymena</i> cultures by approximately 75%. We are currently conducting further studies to determine the mechanism through which these peptides are signaling.</p>		
Bethany C. Khol Katelyn R. Malik Heather G. Kuruvilla	Faculty, Undergraduate Students	Science and Mathematics	Netrin-1 Signals Through Protein Kinases in <i>Tetrahymena thermophila</i>
	<p>Netrins are a family of signaling proteins involved in developmental processes such as neuronal guidance and angiogenesis. The best characterized netrin, netrin-1, signals through a number of different receptors. When acting as a chemoattractant, netrin-1 primarily signals through the DCC receptor and associated protein tyrosine kinase and MAP kinase signaling pathways. When acting as a chemorepellent, netrin-1 signals through the UNC5 receptor, which involves recruitment of the protein tyrosine phosphatase, SHP2.</p> <p>While netrins are ubiquitously expressed throughout the animal kingdom, our laboratory was the first to describe a netrin-1 like protein in <i>Tetrahymena</i>. This netrin-1 like protein is secreted from <i>Tetrahymena</i> and acts as a chemorepellent. In our current study, we describe signaling through netrin-1 in this organism. Netrin-1 signaling is inhibited by the tyrosine kinase inhibitor, hypericin, and by the broad-spectrum kinase inhibitor, apigenin, both acting in the micromolar range. We are conducting further studies to determine whether netrin-1 signaling results in changes to the phosphorylation state of intracellular proteins.</p>		
Stephanie J. Hermann Bailey L. Hixon Ryan D. Kvarness Jade Lee Gregg W. Mendel Daniele T. Modderman Lois Parks David F. Paulding Kenneth W. Ward Matthew A. Sittler Heather G. Kuruvilla	Faculty, Undergraduate Students	Science and Mathematics	Netrin-3 Avoidance and Mitotic Inhibition in <i>Tetrahymena thermophila</i> Involves Intracellular Calcium and Serine/Threonine Kinase Activity
	<p>Netrins are a family of signaling proteins ubiquitously expressed throughout the animal kingdom. While netrin-1 has been well characterized, other netrins, such as netrin-3, remain less well understood. In our current study, we characterize the behavior of two netrin-3 peptides, one derived from the N-terminal and one derived from the C-terminal of netrin-3. Both peptides cause avoidance behavior and mitotic inhibition in <i>Tetrahymena thermophila</i> at concentrations as low as 0.5 micrograms per milliliter. These effects can be reversed by addition of the calcium chelator, EGTA; the intracellular calcium chelator, BAPTA-AM, or the serine/threonine kinase inhibitor, apigenin. The broad spectrum tyrosine kinase inhibitor, genistein, has no effect on netrin-3 signaling, indicating that netrin-3 signaling in this organism uses a different pathway than the previously described netrin-1 pathway. Further studies will allow us to better describe the netrin-3 signaling pathway in this organism.</p>		
Bethany C. Khol Katelyn R. Malik Heather G. Kuruvilla	Faculty, Undergraduate Students	Science and Mathematics	Immunolocalization of a Netrin-3 Like Peptide in <i>Tetrahymena thermophila</i> Using Antibodies Against the N- and C-terminus of the Protein
	<p><i>Tetrahymena thermophila</i> are free-living, unicellular, eukaryotic protozoas that live in a variety of aquatic environments. These organisms interact with their environment by responding to chemorepellents and chemoattractants which direct them toward favorable stimuli, such as food, and away from unfavorable stimuli, such as predators. We have previously described two netrin-like proteins, a netrin-1 like protein, and a netrin-3 like protein, which are secreted from <i>Tetrahymena</i>. Both of these proteins act as chemorepellents, and may allow cells to communicate with each other regarding population density, preventing them from outgrowing the available environmental resources. In our current study, we used antibodies against the N- and C-terminal of netrin-3 to show the distribution of this protein throughout the cell. We find that netrin-3 is highly colocalized with the endoplasmic reticulum and colocalizes with tubulin to a lesser extent. This is to be expected for a protein that is secreted from cells and trafficked on microtubules.</p>		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Mark Guilliams	Undergraduate Student	Science and Mathematics	A correlation and stratigraphy of detailed measured core sections of the Waynesville and Liberty Formations (Katian; Richmondian) - transecting Warren, Clinton, and Fayette Counties of Ohio
	<p>The stratigraphy of the Cincinnati is difficult to understand and interpret which has resulted in various models for deposition ranging from a layer cake model with continuous beds to completely discontinuous beds. The interest of this study is the Liberty and Waynesville Formations (previously part of the Bull Fork Formation); these are Late Ordovician (Katian; Richmondian) units of predominantly limestone and shale. This project assesses the continuity of fine scale beds within these formations across a small area (approx. the size of Ohio's Clinton County) by correlating measured sections from drill cores. The project involved the study of five rock cores (cores 2627, 3240, 868, 2682, and 2620) held in the ODNR H.R. Collins Core Repository and the comparison with published sections and unpublished field notes from neighboring outcrops. The project's goal was to increase the detail of the measured sections to a one-inch resolution for the Waynesville and Liberty Formations and to increase the number of completed sections for the northeastern portion of the Cincinnati Arch. The paleontology was noted, when visible in core section, for correlation with the known faunal epiboles. The use of these has proven troublesome when examining cores due to the inherent limitations in encountering the fossils when drilling which has led to more reliance on lithological correlations between the cores. This project has revealed continuity of sets of lithological beds; however, no continuous individual lithological beds were recognizable in core samples across the region. Without the use of fossil correlation, there are no continuous lithological beds and no clear formational contacts for the Liberty, Waynesville, and Whitewater Formations. Without the use of these fossil epiboles, the differentiation of the formations is extremely difficult and nearly impossible in some localities. In summary, in areas where surface outcrops are limited for these formations, core sections can be used to correlate the larger cycles, but the fine resolution correlation requires the identification of epiboles, which is only practical in outcrop.</p>		
Emma Baccus Victoria Gahman Hannah Phillips Shannon Rappaport Alyssa Reiter Kaleb M. Pauley	Undergraduate Students	Science and Mathematics	Migration Frustrations of miR-146a Regulation
	<p>The autoimmune disease, Sjögren's Syndrome (SS), causes the degradation of salivary and lacrimal glands due to an influx of immune cells. In previous studies, a significant increase in miR-146a was observed in the peripheral blood mononuclear cells of SS patients. Since immune cell infiltration is critical in SS pathogenesis, the following research examines the effect of miR-146a on cell migration. We hypothesize that transfecting THP-1 human monocytes with synthetic miR-146a will downregulate migration of the monocytes based on other studies stating that miR-146a downregulates migration in vivo. In order to execute our experiment, we transfected THP-1 cells with synthetic miR-146a and incubated the monocytes for 3 days. In the migration assay, the cells were transferred to a semipermeable membrane and MCP-1 was introduced as a chemoattractant. qPCR was also used to confirm the success of the transfection. When compared to mock-transfected and negative control cells, a significant increase of migration was observed in the THP-1 transfected cells (p value = 0.002 and 0.01, respectively). The qPCR also revealed an upregulation of miR-146a expression.</p> <p>In previous studies miR-146a directly inhibited TRAF6. Considering this evidence, we decided to knockdown TRAF6 with siRNA to observe the migrational effect. Our preliminary data shows that knockdown of TRAF6 decreases migration. Further experimentation must be conducted in order to ascertain the signaling pathway of miR-146a in migration, since it appears that miR-146a does not affect migration through TRAF6. Our data suggests that the original hypothesis was incorrect and that miR-146a stimulates migration of THP-1 cells through an undetermined mechanism.</p>		
Ryan Marquardt Daniel J. Stank Kaleb M. Pauley	Faculty, Undergraduate Students	Science and Mathematics	MiR-146a Upregulation of Phagocytosis in Human Macrophages
	<p>Sjögrens Syndrome (SjS) is an autoimmune disease that attacks exocrine glands such as salivary and lacrimal glands resulting in severe dryness of the mouth and eyes. Previous studies have linked increased microRNA-146a (miR-146a) expression in peripheral blood mononuclear cells in SjS patients compared to healthy controls. MicroRNAs (miRNAs), small non-coding RNA molecules that post-transcriptionally regulate gene expression, are known to play key regulatory roles in immune responses and have been implicated in a growing number of autoimmune disorders. Further investigation into the role of increased miR-146a expression in SjS revealed links to several immune functions including phagocytosis. Our goal was to further examine the relationship between miR-146a expression and the rate of phagocytosis in human macrophages by using apoptotic human cells as a phagocytic target. We hypothesized that upregulation of miR-146a would increase phagocytic activity of differentiated THP-1 human monocytes. To quantify phagocytic activity, a pH-sensitive fluorescent dye (pHrodo) was used to indicate the E. coli or apoptotic Jurkats that had been phagocytosed. THP-1 cells were transfected with miR-146a and differentiated into macrophages. Phagocytic activity was observed by incubating fluorescently labeled E.coli or apoptotic Jurkat cells with miR-146a transfected and mock transfected THP-1 cells for 2-4 hours. Fluorescence intensity was quantified using a fluorescent plate reader (E. coli) and microscopy (apoptotic Jurkats). MiR-146a-transfected THP-1 cells exhibited significantly increased phagocytic activity of fluorescently labeled E. coli (P<0.001) and apoptotic Jurkats. Knockdown of TRAF6, a gene target of miR-146a, did not impact the phagocytic activity. MiR-146a appears to upregulate phagocytic activity in human THP-1 cells through an unknown mechanism. Further studies are in progress to determine the mechanism by which miR-146a upregulates phagocytosis.</p>		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Robert L. Paris Kaleb M. Pauley Ryan K. Lokkesmoe Sarah E. Lyon James C. Dunlap Julia M. Pierre Timothy P. VanWingerden Finny J. Johns Kyle J. Kilchrist Tyler J. Reid Caleb M. Winn	Faculty, Undergraduate Students	Science and Mathematics	Genetic variation in concentration of the 33-mer protein subcomponent in wheat
	<p>Celiac Disease is a hypersensitive response to gluten caused by HLA-DQ2 or HLA-DQ8 T-cell presentation, initiating destruction of intestinal epithelial cells. Currently, the only remedy for those suffering from celiac disease is elimination of all gluten from the diet. Studies indicate that an indigestible fragment of the gluten molecule, alpha-gliadin subcomponent 33-mer, rich in proline and glutamine, is responsible for the hypersensitivity response. Determination of 33-mer concentration in wheat lines could be beneficial to future development of wheat lines with reduced 33-mer concentration. Protein from wheat flour was extracted and subjected to ELISA techniques in order to quantify the concentration of 33-mer. A technique that quantifies the concentration of 33-mer is a necessary first step for future research efforts focused on identification and development of wheat lines with reduced concentrations of 33-mer. It is possible that wheat with reduced 33-mer may be suitable for consumption by individuals with celiac disease.</p>		
S. Jackson Grout Bryce C. MacTurk Amanda D. Sims Kaleb M. Pauley	Faculty, Undergraduate Students	Science and Mathematics	Effect of Metformin on miR-146a Expression
	<p>Sjögren's Syndrome (SjS) is an autoimmune disorder that affects secretory glands in the human body, restricting their function and causing extreme dryness in areas like the mouth and eyes. miR-146a is an anti-inflammatory microRNA that targets the NF κB activation pathway. Previous studies have shown that SjS patients have increased miR-146a expression, despite having high levels of inflammation. The objective of this study was to investigate whether metformin, a diabetes drug with a wide variety of effects and potential functions, reduces levels of miR-146a expression. Metformin is known to reduce inflammation by inhibiting the activation of NF κB. THP-1 human monocytes were treated with various concentrations of metformin ranging from 12.5μM to 200μM. The cells were treated for 24 hours before total RNA was isolated, and qRT-PCR was utilized to compare miR-146a expression in metformin-treated versus untreated cells. Our results showed a dose-dependent decrease of miR-146a expression in the presence of metformin. These results are reasonable since miR-146a expression is dependent on NF κB activation, and metformin is known to inhibit the activation of NF κB. Further studies will investigate metformin's ability to suppress inflammation in varying conditions.</p>		
Emily R. Jackson	Undergraduate Student	Science and Mathematics	Petrographic Analysis of the Oriskany Sandstone (Lower Devonian) from the Ellisburg Storage Pool, Potter County, Northcentral Pennsylvania
	<p>Three Lower Devonian Oriskany Sandstone cores, EW-216 (core 1), EW-415 (core 2), and EW-706 (core 3), were obtained from Dominion Transmission's Ellisburg Storage Pool, located in Potter County, northcentral PA. The goal of the project was to create a petrographic analysis and description of the cores, with special attention given to any deformational features associated with stress/strain indicators. Extended Range Helium Porosimeter measurements, XRD analysis, and thin section production were completed by Calgary Rock and Materials. The cores were then analyzed using a petrographic microscope; a complete description from the analysis was written for each core. Photographs were taken of any unusual or diagnostic features in the thin sections. Porosity and permeability for the cores were: 9.88 % porosity and 76.5 md air permeability (core 1), 7.95% porosity and 10.5 md air permeability (core 2), and 9.41 % porosity and 26.7 md air permeability (core 3). Quartz and dolomite were the primary mineral constituents for each core (0.88 vol fraction and 0.10 vol fraction for core 1; 0.76 vol fraction and 0.24 vol fraction for core 2; and 0.89 vol fraction and 0.11 vol fraction for core 3, respectively). Calcite was also present in core 1 (0.02 vol fraction), and in trace amounts in core 2 and core 3. Fluorapatite, pyrite, and biotite were present in trace amounts in each of the cores. Organic material was identified (in close proximity with pyrite in some cases) and closely associated with compaction and deformational features in the sandstone. Possible stylolites were identified in three thin sections, and possible fractures traces in four thin sections. Each core had bimodal grain size, and several thin sections showed elongated quartz grains. No distinct grading or bedding was visible. While the study gave a complete petrographic description, additional information (such as oriented cores) is needed to make any definite conclusions about the history of the stress/strain causing the deformational and compaction features seen in the thin sections.</p>		
Tracy L. Collins Chandra N. Swiech Reyna G. Osorio	Faculty, Undergraduate Students	Science and Mathematics	The Effect of Photoactivated TMP on Burkholderia cepacia Biofilms
	<p>Burkholderia cepacia is an opportunistic pathogen that causes infections in immunocompromised individuals such as cystic fibrosis patients. B. cepacia infections are typically characterized by the formation of complex communities of cells known as biofilms. Because B. cepacia biofilms are difficult to eradicate using antibiotics, it is important to pursue alternative treatment methods. Photodynamic therapy (PDT) is a type of therapy that uses light, a photosensitizer, and oxygen to elicit cell death through the production of reactive oxygen species. PDT has been shown in previous studies to be successful in killing both Pseudomonas aeruginosa and Staphylococcus aureus. In this study, we examined the effect of a cationic porphyrin on B. cepacia biofilms by exposing static biofilms to 5,10,15,20-tetrakis(1-methyl-pyridino)-21H,23H-porphine, tetra-p-tosylate salt (TMP) followed by irradiation. Standard plate counts of cells recovered from attached biofilms revealed a 0.7-log₁₀ reduction (80.2%) in cell viability in the presence of 225μM of TMP and light. In addition, there was a 2.74-log₁₀ reduction in cell viability when biofilms were treated with TMP and ciprofloxacin in comparison to a 1.96-log₁₀ reduction when biofilms were treated with ciprofloxacin alone. Because surface motility is involved in biofilm formation, we also examined the effects of TMP on swarming motility in B. cepacia and P. aeruginosa. In the presence of TMP in the dark, there was a substantial increase in swarming motility of both B. cepacia and P. aeruginosa. These results suggest that photoactivated TMP not only kills biofilm-associated cells, but may promote biofilm disruption through pre-dispersion behavior in the absence of light.</p>		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Tracy Collins Jessica Weisensee Alayna Sanderson Andrea Schwartz Lauren E. Ward Stephanie Nicholls Molly Yandrofski	Faculty, Undergraduate Students	Science and Mathematics	E,E-farnesol inhibits swarming motility in Burkholderia cepacia through rhamnolipid production
	<p>Burkholderia cepacia and Candida albicans both exhibit cell-to-cell communication through the use of quorum-sensing molecules (QSM) known as autoinducers. E,E-farnesol is a QSM produced by C. albicans which regulates its conversion from yeast to mycelium.</p> <p>Because there is a positive correlation between the presence of B. cepacia and C. albicans in the lungs of individuals with cystic fibrosis (CF), we examined whether E,E-farnesol had an effect on swarming motility in B. cepacia. Swarming motility was inhibited when B. cepacia was exposed to 250 µM of E,E-farnesol. In addition, there was a 26.8% decrease in rhamnolipid production when cells were grown in the presence of E,E-farnesol. These biosurfactants are known to regulate swarming motility. Changes in the rhamnolipid concentrations could account for the inhibition of swarming motility observed in the presence of E,E-farnesol. The effect of E,E-farnesol on B. cepacia biofilms was also examined because these complex-community structures are detrimental to the lungs of CF patients and are quorum-sensing regulated. Crystal violet staining showed that E,E-farnesol did not significantly affect biofilm formation in B. cepacia. Further studies are needed to determine the effects of E,E-farnesol on established B. cepacia biofilms and whether it can be combined with traditional antibiotics to disrupt these structures.</p>		
Michael Sprague	Undergraduate Student	Science and Mathematics	A description of a new Allosaurus (Dinosauria: Theropoda) skull with comparison to additional specimens
	<p>Allosaurus was a genus of large theropod dinosaur from the Late Jurassic Period (Kimmeridgian to early Tithonian). The history of the taxonomic classification of Allosaurus species is muddled at best, and the number of recognized species varies significantly between researchers. Most Allosaurus from the Morrison Formation are typically lumped into a single species, Allosaurus fragilis. Given the amount of variation seen in Allosaurus through the Morrison, the genus may be more diverse than generally recognized. A nearly complete Allosaurus skull (CM 279) located in the Creation Museum in Petersburg, KY is described, with comparison of its skull morphology to two other well-known Allosaurus skulls at the Dinosaur National Monument (DNM 2560) in Jensen, Utah, and the Museum of the Rockies (MOR 693) in Bozeman, Montana. Similarities are noted between CM 297 and DNM 2560, which share the same rectangular muzzle shape, differing from the pointed muzzle and triangular skull of MOR 693. This difference suggests CM 297 and DNM 2560 belong to a different species than MOR 693, which potentially belongs to the recently described A. jimmdadsenni, though more research into this classification is needed. Furthermore, CM 297 and DNM 2560, while classified as Allosaurus fragilis, show a notable difference from the neotype for A. fragilis, AMNH 4734. This difference is often attributed to supposed taphonomic distortion in AMNH 4734, though this claim may be erroneous.</p>		
Erica A. Loughner Jordan C. Oldham	Undergraduate Students	Science and Mathematics	Geniune or Reproduction: A Comparison of 3D Imaging Techniques
	<p>Advancements in technology associated with 3D imaging for both print and digital applications are transforming many aspects of geology. Museums, researchers, and educators are now using 3D models to depict and reproduce fossils, minerals, and crystals for study, thereby reducing the risk of damage to valuable original specimens. This project examined which of the two processes available to Cedarville University geology program produces the best quality digital image and, subsequently, the best 3D printed object of a macroscopic-sized specimen. The first method utilizes the camera on a smartphone to take overlapping photos of the entire specimen (fossil or mineral) – top, bottom, and sides. Then, using free software called AutoDesk Remake the images are processed into a digital 3D model. The digital model is then sent to a LulzBot Mini 3D printer for printing. The second method makes use of a NextEngine 3D scanner rather than a camera. The specimen is placed on a rotating pedestal and laser scanners sweep across the specimen as cameras look at how much distortion is created. The scanner data is imported into ScanStudio HD software and a point cloud is created. From the point cloud a 3D model is created for viewing on the computer or for 3D printing. For this study the quality of the digital images and printed reproductions that were derived from the two methods was compared. In the final analysis of the various 3D models (printed and digital) it was determined that the 3D scanning process produced the better quality facsimiles.</p>		
Michael Sprague	Undergraduate Student	Science and Mathematics	Understanding Feathered Dinosaurs
	<p>Young-earth creationists hold to separate creations of birds and land animals due to a literal interpretation of Genesis 1:20-25, which describes their creations on different days. As such, they oppose the conventional model of theropod-to-bird evolution. For many years, there were few Mesozoic birds known, namely Hesperornis and Ichthyornis. Specimens such as Archaeopteryx, found in 1861, seemed to strengthen the argument for the proposed transition. However, even after John Ostrom reinvigorated the idea of dinosaur-to-bird evolution in 1960 with the discovery of Deinonychus, evidence of this transition was still sparse. In the 1990's, exquisitely-preserved dinosaur fossils began to pour out of Liaoning Province, China sporting feathers and several feather-like filaments. Typical creationist responses to feathered dinosaur fossils include 1) denying that they are real fossils, 2) assuming that "dino-fuzz" is something other than integument, or 3) arbitrarily calling some fossils birds and others dinosaurs. Some creationists believe that no feathered dinosaurs have been found, despite there being evidence of feathers in most families within Theropoda.</p>		

POSTER PRESENTATIONS *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE
Laura Cashman William A. Smith Shannon Swicker Abigail Williams Mark A. Gathany	Faculty, Undergraduate Students	Science and Mathematics	Spatial and temporal variability of water quality parameters in Cedar Lake (Cedarville, Ohio)
<p>Cedar Lake is a man-made lake that is central to Cedarville University's campus. This focal point of the campus is a source of aesthetic appeal and beauty of Cedarville University. The lake ranges in depth from 0.6-3.7m, is 140m by 150m across, an approximate volume of 40,000 m³ and demonstrates normal capabilities to support fish and other life. There is, however, some concern over Cedar Lake's level of productivity as undesirable algae blooms are common during warmer months. In October and November 2016 we began to assess the spatial and temporal variability of water chemistry by measuring temperature (C), dissolved oxygen (DO), ammonium (NH₄⁺), nitrate (NO₃⁻), conductivity, and total dissolved solids. We recorded GPS coordinates of each sample location. We predicted that temperature and DO would be greatest at the surface (due to heating and mixing) and NH₄⁺/NO₃⁻ near the shore (due to runoff).</p> <p>We measured the following parameter ranges: temperature of 10.4 - 12.5 (C), DO = 8.03 - 10.01 mg/L, NH₄⁺ 0.56 - 0.84 (mg/L), NO₃⁻ = 0.18 - 0.41 (mg/L), conductivity = 250.4 - 277.6 (mS/cm), and TDS 162.76 - 180.44 (g/L). We found that DO was significantly different ($p < 0.05$) for both sampling date (October/November) and location (shallow/deep). Using spatial interpolation techniques in ArcGIS we were able to provide supporting evidence for our hypothesis where NH₄⁺/NO₃⁻ levels were greater near the lake's edge. We also noted a spatial trend in surface DO as it declined from highest values in the northeastern portion of the lake to the lowest values near the outlet.</p>			
Laura A. Cashman Aaron Hutchison	Faculty, Undergraduate Student	Science and Mathematics	Massie Creek Water Chemistry and Potential Agro-chemical Impact
<p>Massie Creek is stream centered among agricultural communities. Due to runoff from agricultural land, it is expected that evidence of agro-chemical use may be found in the form of certain metallic ions and other chemical species present in fertilizers or pesticides. The concentration of K⁺, Fe²⁺, Cu²⁺, Pb²⁺ will be determined using Flame Atomic Absorption Spectroscopy and a colorimetric method will be used for total phosphorus and nitrite content in samples. Practice runs using lab-created samples have been performed to evaluate these methods. Standards were made from the target ion-producing reagents KCl, Cu metal, Fe(NH₄)₂(SO₄)₂, PbNO₃, KNO₂, and NaH₂PO₄ in concentrations ranging from 0.5 ppm to 10 ppm. Each analytical method produced experimentally acceptable results, predicting concentrations of test samples well within acceptable error values. Therefore, the analytical methods used were demonstrated effective in the assessment of the target ionic species concentrations.</p> <p>For the next phase, several representative samples from Massie Creek will be analyzed according to these procedures. It is possible, by determining the concentration of these chemical species before major planting or harvesting seasons, to obtain a background level profile of the waters. The accumulation potential and environmental impact of these chemical species may then be accessed. The accumulation of certain heavy metals and agrochemicals (for which nitrite, phosphorus, and potassium are measured) are concerning because high concentrations of these pollutants may cause a number of ecological and medical problems. Some of these effects on human health include neurological damage, mental deterioration, and fatigue, while ecological effects include a lowering of dissolved oxygen, increased risk of eutrophication, neurotoxicity to animal life, and increased acidity of waters. It is hypothesized that actual concentrations from the sampling sites are expected to yield metal, nitrite, and total phosphorus content higher than typical streams from non-agricultural areas.</p>			
Joel Twinem	Undergraduate Student	Science and Mathematics	The Relationship Between Static Water Levels, Bedrock Topography, and Glacial Drift Thickness for the Cedarville, Greene County, Ohio Area
<p>Cedarville, Ohio, is an area covered in glacial deposits from the Pleistocene age. During this time, the Silurian dolomitic bedrock was exposed and worn down. Glacial till composed of sand and gravel was deposited atop the dolomite in wake of the glaciers retreat. The combination of vuggy bedrock and permeability of the overlying sediments cause the area to be very conducive to aquifer storage and movement. This study attempts to determine the relationship between bedrock topography, till thickness, and static water level, as well as the implications for future drilling. 26 static water levels were measured in the field using a Solinst water level meter. 48 bedrock elevation readings were obtained from an Ohio Department of Natural Resources database. Over 300 surface elevation points for the study area were pulled from Google Earth. Data was compiled into Excel spreadsheets and then transferred to ArcGIS. Contour maps and geologic cross sections were drawn up to determine any patterns that might arise. Analysis of the data showed that a greater volume of till led to a proportionally higher static water level in the North, East, and Southern areas of study. In the Western portion of the area, water level to till and bedrock ratios were less predictable. In general, however, water levels seemed to be highest and most easily accessible when there was a large amount of unconsolidated sediment overlying the bedrock. In terms of ease of penetration, available water, and cost efficiency, these areas would be ideal for drilling new wells.</p>			
Alexis Steffanni Brydon Koch Carly Catalanello Michelle Gamberdella	Undergraduate Students	Social Work	Child Brides
<p>The goal of this presentation is to take a look into the human rights violation of child marriage happening in countries all over the world. For the purpose of this presentation, we will focus on four countries where child marriages are extremely prevalent: India, Niger, Bangladesh, and Yemen. First, we will begin with a brief history and background of child brides and statistics related to this population. Second, we will discuss the four countries (as stated above) where this is a major problem, and why the rates of child brides are especially high within each country. Third, we will consider the consequences of child marriages and the ethical implications. Lastly, we will suggest implementation of an intervention for change that is possible on a global level. We hope to educate, provide awareness, and propose ideas for the implementation of interventions to eradicate this human rights issue.</p>			



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