

## Wheeling Jesuit University Student Research and Scholarship Symposium Abstracts

**Explanation of the coding system:** The following abstracts are presented in alphabetical order by first author. For the oral presentations, the information in the brackets includes the time of the presentation (e.g. 2:28), the session (e.g. 2C), and the location of the session (e.g. ASC-212). For poster sessions, the bracketed information includes the time of the session (e.g. 1:15) and the poster board number where the poster is to be found (e.g. P4).

Bates, Abra: *The Effects of Varying Pitching Rate on Organic Acid Production* [(3:30) (3A) (ASC-212)] Due to the sensitive nature of beer brewing, many factors can greatly influence the final product. The pitching rate, which is the amount of yeast cells per volume of solution, is an important determinant of the quality of the finished beer. Organic acids can directly affect the flavor of beer by lowering its pH. Some organic acids are derived from the malt and are present at low levels in wort, with their concentrations increasing during fermentation. Other organic acids are solely a result of yeast metabolism. Few studies have been conducted in order to find a correlation between the pitching rate and organic acids produced. The purpose of this experiment is to examine the effects of varying pitching rate upon organic acid production. A 5-gallon batch will be subdivided into five 1-gallon batches, pitching rates ranging from 1 million cells per gallon to 10 billion cells per gallon. High performance liquid chromatography will be used as a method of measuring the different organic acids in the final products. The following organic acids, which are common in beer, will be measured: phosphoric acid, citric acid, pyruvic acid, gluconic acid, malic acid, succinic acid, lactic acid, acetic acid, pyroglutamic acid, and carbonic acid. The brewing is currently in progress and the organic acids will be measured and quantitated once brewing is complete. Once obtained, the results should help provide data, which could be of great assistance to beer brewers.

Baxter, Corey:  *$\beta$ -catenin Localization in Phorbol Acetate-Treated MDCK Cells* [(1:15) (P4)]  $\beta$ -catenin is an intracellular protein which participates in both cell signaling via the wingless (Wnt) signaling pathway and cell-cell adhesion. In the nucleus,  $\beta$ -catenin heterodimerizes with T-cell factor (TCF)/lymphoid enhancing factor (LEF) during Wnt signaling to induce gene expression. Studies have shown that in the presence of tetradecanoylphorbol acetate (TPA),  $\beta$ -catenin is more prominently localized to the nucleus increasing nuclear signaling. Thus, there is an increase in cell proliferation and decrease in cell adhesion. Therefore, we will be conducting the current study to determine whether TPA alters the localization of  $\beta$ -catenin in MDCK cells. Overall, these results will demonstrate that in the presence of TPA,  $\beta$ -catenin will become less localized in the membrane and more active within the cytoplasm and nucleus. This study will suggest that  $\beta$ -catenin activity is increased, leading to an increase in cell proliferation and a decrease in cell adhesion.

Booth, Lannette: *A Study of the Effects of Heavy Metals from Coal Fly Ash Contained in Little Blue Run Lake* [(3:10) (3A) (ASC-212)] Little Blue Run Lake is a catchment area designed to store and dispose of coal byproducts, namely coal fly ash. Fly ash contains a high concentration of heavy metals that are released into the water of the lake. All aquatic life has died as a result of the dumping of this ash into the lake. There is evidence from recent studies that suggests that life might be returning to the lake with the discovery of a species of aquatic insect found during sampling. With these factors, the purpose of the study is to assess the effects coal fly ash has on the entire surrounding ecosystem. This assessment will be carried out by a series of water quality testing using such instruments as a YSI 650 Multi-parameter Probe and an Atomic Absorption Spectrometer. The criteria for analysis are pH levels, metal content, conductivity,

dissolved oxygen, and the presence of any aquatic life. Because water quality testing is currently taking place, the results of the study are pending.

Brothers, Scott: *A Proposed Synthetic Route of Copper (II) and Indium (III) Dithiocarbamates to  $CuInS_x$  as Studied by Spectroscopic and Thermal Techniques* [(10:05) (1B) (ASC-213)]

Complexes of indium (III) and copper (II) diethyl- and dibenzylidithiocarbamates have been synthesized by standard techniques. These compounds, which are being studied extensively by NASA for prospective uses for thin-film deposition on photovoltaic cells, have been analyzed and characterized by melting point analysis, thermogravimetric analysis (TGA), gas chromatography and mass spectrometry (GC/MS), elemental analysis, and gas-phase infrared spectroscopy (FT-IR). The melting point analysis of the copper (II) compounds show identical temperature ranges of decomposition as the thermogravimetric analyzer, with some of the sample volatilizing during the decomposition process and resulting in a residue. Previous thermogravimetric research has shown a distinct two-step decomposition for copper (II) dibenzylidithiocarbamate with a residue of  $CuS$ , and a one-step decomposition for copper (II) diethylidithiocarbamate, indium (III) dibenzylidithiocarbamate, and indium (III) diethylidithiocarbamate, which yielded residues of  $Cu_2S$ ,  $In_2S_3$ , and a yet to be determined product, respectively. Current ongoing studies of the joint decomposition of an indium (III) dialkylidithiocarbamate and a copper (II) dialkylidithiocarbamate in different molar and ligand to ligand ratios have yielded significant data as to the pathway of the simultaneous thermal decomposition of different compounds. In the example of the decomposition of one mole of copper (II) dibenzylidithiocarbamate and one mole of indium (III) dibenzylidithiocarbamate, the data leads significantly to the conclusion that  $CuInS$  is the product of the decomposition. The research of these complexes has proven to be very exciting and promising for the continuing fabrication of progressively higher-efficiency photovoltaic applications.

Brunetta, Carl: *Constructing a Continuous Flow Reactor for Catalyst Deactivation Studies* [(10:25) (1B) (ASC-213)] A continuous flow reactor was constructed to investigate the catalyst deactivation that occurs when natural gas is converted to hydrogen. The production of hydrogen is very important for the operation of fuel cells and is a feedstock for converting carbon monoxide to gasoline fuels via of the Fisher Tropsch process. Catalyst deactivation occurs when carbon deposits on the catalyst and slows the reaction down. This kinetic process has to be factored into the rate expression in order to accurately describe the chemical reaction. The construction of the reactor will be described as well as presenting initial data on the deactivation of palladium catalyst at different operating temperatures.

Canter, R.J: *Abstinence Opinions* [(10:25) (1C) (ASC-215)] One hundred traditionally aged college students (aged 18 - 24 years with a mean of 19.7) completed a survey concerning sexual abstinence. Students provided demographic information and were asked to indicate their level of agreement with twenty-three statements using a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Results showed that the sample define abstinence as refraining from engaging in sexual intercourse, but those engaging in masturbation, mutual masturbation and oral sex without vaginal penetration are still abstinent. The sample also believed that once a person has had sexual intercourse they can become abstinent again. Students, however, also believed that definitions of abstinence vary and that everyone does not understand abstinence in the same way. Significant correlations showed that those who considered themselves to be abstinent also consider themselves to be religious, admire others who were abstinent, believe that abstinence was a good idea for them, believe that abstinence should be everyone's goal, were less likely to be involved in a romantic relationship, and reported having higher GPAs. Abstinence did not correlate significantly with political views or religious conservatism, however. Interestingly, students did believe that one could have oral sex and still

be a virgin. Students who held this view tended to consider themselves politically liberal, not Republicans, and not religiously conservative.

Chase, Courtney: *Feminism in the Works of Mary Wollstonecraft and Virginia Woolf* [(11:15) (2C) (ASC-215)] Mary Wollstonecraft and Virginia Woolf serve as examples of two female authors who effectively advance the concept of feminism and the female self within their literary works. First, an analysis of two critical essays, Wollstonecraft's *Vindication of the Rights of Woman* and Woolf's *A Room of One's Own*, specifies the cultural and historical beliefs that dominated each of the writers' time periods. Within the analysis of these two works, one may trace the conception and development of the feminist voice in literature and outline the major tenets of each of the authors' beliefs surrounding female responsibilities and liberties. Next, these two differing conceptions of femininity are explored through Woolf's fictional work entitled *To the Lighthouse*. Two characters within the work perfectly fit the two different embodiments of the female self found within Wollstonecraft's and Woolf's critical essays. These characters, like Mary Wollstonecraft and Virginia Woolf, must learn how to integrate and appreciate both the past and the future trends in feminism into their own lives in order to fully participate in the progressive movement.

Crowe, Amber: *An examination of the Stereotypical Behaviors in a Captive Ocelot*. [(11:15) (2B) (ASC-213)] The effects of enrichment on the stereotypical behaviors seen in a captive ocelot was studied at the Good Zoo at Oglebay in Wheeling WV. Measurements of behavior were taken with and without enrichment provided. When enrichment was absent, the dominant behaviors were pacing and sitting. It was expected that if enrichment was provided on a daily basis, the amount of these stereotypical behaviors should be reduced, if not eliminated. When enrichment was provided, pacing and sitting were not greatly reduced. These results suggest that enrichment is not enough to eliminate stereotypical behaviors in a captive ocelot. This research also suggests that pacing and sitting may be a necessary part of every day life for this animal. Further studies with enrichment are needed for more conclusive results.

Decker, Ashley: *Examining the Symbolism of the Almond Tree in Jeremiah 1:11-12* [(12:15) (2A) (ASC-212)] Traditional scholarship has seen the symbolism of the almond tree in Jeremiah as an oracle of impending judgment and destruction. I will attempt to argue, using various other Old Testament passages, that the almond tree is really a symbol for Israel. It is also a symbol that God will watch over His chosen nation, for it was the tree He Himself planted. He will watch His tree (Israel) grow if they choose to obey the covenant. Or He will also watch His tree allow itself to be destroyed by straying from His ways.

Dengler, Christina: *Soil content analysis on the Wheeling Rails to Trails Recreational Corridor* [(1:15) (P7)] Acid Mine Drainage, caused by water run off from an abandoned mine shaft, is a serious threat, warranting treatment and corrective measures in affected areas. This study evaluates the severity of AMD caused by the collapse of the Mt. Wood Tunnel, a proposed addition to the Rails to Trails network located in close proximity to Wheeling Creek in Wheeling, WV. By determining the pH and dissolved metal levels in the samples taken in and around the tunnel, an effective evaluation of water runoff into Wheeling Creek can be made. The pH of the samples will be measured using a Glass Electrode Meter, and analysis of DTPA soluble metals: cadmium, copper, iron, lead, aluminum and zinc, contained in the samples will be conducted through Atomic Absorption Spectrophotometry. Although the soil and water content analysis is expected to show high acidity and elevated concentrations of DTPA soluble metals commonly associated with AMD, the low pH and quantities of such metals are not predicted to exceed regulations set to maintain the quality of recreational areas and aquatic life. Should the materials exceed these regulatory limits, transformation and usage of the Mt. Wood Tunnel and

Fulton Connection as a recreational corridor should be postponed until corrective actions are taken.

Dent, Garry: *Deactivation of Platinum Catalysts for the Conversion of Methane to H<sub>2</sub>* [(9:45) (1B) (ASC-213)] The reaction of methane with carbon dioxide to produce synthesis gas consisting of carbon monoxide and hydrogen is an important industrial process. With the proper catalyst, CO and H<sub>2</sub> can be converted into gasoline or many chemicals. During the reaction of CH<sub>4</sub> + CO<sub>2</sub> → 2 CO + 2 H<sub>2</sub>, carbon is deposited on the Pt/Al<sub>2</sub>O<sub>3</sub> catalyst and reduces the production of CO and H<sub>2</sub>. Carbon deposition on catalysts is a common occurrence in many petroleum-processing reactions. To determine when a commercial reactor has to be shut down in order to replace the catalyst, the kinetics of deactivation have to be determined. For this project, the reaction describing this decrease in catalytic activity as a function of time was determined. The extent of catalyst deactivation as a function of temperature was determined using a continuous flow micro catalytic reactor. A TGA/FTIR system was used to determine the weight of carbon deposited as a function of time and temperature.

Fink, Barbara: *The effect of VEGF and IL-8 on the growth of smooth muscle cells* [(11:55) (2B) (ASC-213)] Angiogenesis is the growth of new blood vessels and has been shown to occur in response to Vascular Endothelial Growth Factor (VEGF) and Interleukin-8 (IL-8). Past research has shown that these factors increase endothelial growth in animal subjects. However, no research has been conducted in order to determine if growth occurs in smooth muscle cell lines. This research was conducted in order to assess the effects of known angiogenic growth factors, VEGF and IL-8, on cultured vascular smooth muscle cells from the A7r5 cell line. It is hypothesized that higher concentrations of VEGF and IL-8 will increase growth of the smooth muscles since it has been shown to promote growth of endothelial cells. It will stimulate growth of smooth muscle as indicated by an increase in cell number. The smooth muscle cells were maintained in cultures in a humidified environment in 5% CO<sub>2</sub> and air. The first experiment was to determine that ideal concentration of smooth muscle cells to be used in future experiments. Concentrations of 100,000, 250,000, 500,000 and 1,000,000 cells were used. 250,000 cells had the most notable and consistent growth. The next phase of experimentation will be to expose 250,000 smooth muscle cells to 100mg, 50mg and 25mg of VEGF and 100mg, 50mg, and mg of IL-8 for four days and eight days. At the end of four and eight days cell number will be determined.

Franks, Jonathan: *Comparative Analysis of Behavior Trends of Camponotus noveboracensis* [(11:35) (2B) (ASC-213)] The ant is a very complex insect. This complexity ranges from a multifaceted caste system to the talented coordination in finding and killing food. Because of the complexities of ant behavior, many environmental factors can affect the way the colony functions. The purpose of this experiment was to test the behavior of the *Camponotus noveboracensis* (Black Carpenter Ant) in response to temperature variances. The data was collected in conjunction with behavioral ethograms and prey recognition. The ethograms at the different temperature range showed different behavioral changes among the caste members. These changes included increased activity of all castes with increased temperature. The higher temperatures also showed a faster response of workers, queens, and males to alarmed guards. The raising temperature also affected the prey recognition by increasing the attack quality. Thus, temperature variances do affect the complex systems of ant behavior.

Giuffre, Candace: *Dithiocarbamates Derived from di-sec-butylamine and sec-butylamine* [(1:15) (P10)] Dithiocarbamates are used in the world today as pesticides, vulcanization accelerators, and pharmaceuticals. The purpose of examining the indium, cobalt, and iron complexes in this study is to develop a photovoltaic coating. The generation of electrical energy from light is used

on NASA's devices that they send out into the universe. After thermally decomposing these compounds made from carbon disulfide, the amine, and the selected metal, a metal sulfide remains. These metal sulfides are what can be used on the substrate surface of the photovoltaic cells. The complexes' physical properties are examined through melting point, infrared spectra, and thermogravimetric analysis.

Grayhem, Rebecca; Esgro, Will; & Sears, Tom: *Effects of Odor Administration on Driving Performance, Safety and Alertness* [(1:15) (P1)] Past research indicates the odors of peppermint and cinnamon enhance motivation, performance, and alertness, decrease fatigue, and serve as central nervous system stimulants. Given these results, it is reasonable to expect that the presentation of peppermint or cinnamon odor while driving may produce a more alert and conscientious driver, and minimize the fatigue associated with prolonged driving. In the present study, 30 participants were monitored during simulated driving under three odor conditions (peppermint, cinnamon, non-odor control). Odors were added to low flow oxygen (1.3L/min) via an oxygen concentrator and presented at the rate of 30 seconds every 15 minutes. Subjective measures of cognitive performance, wakefulness, mood, and workload were also assessed. In general, prolonged driving led to increased anger, fatigue, and physical demand, and decreased vigor. However, fatigue ratings were decreased in the cinnamon condition. Both cinnamon and peppermint administration led to increased ratings of alertness in comparison to the no-odor control condition over the course of the driving scenario. Periodic administration of these odors over long term driving may prove beneficial in maintaining alertness and decreasing highway accidents and fatalities.

Grayhem, Rebecca; Canter, RJ; Lilley, Sarah; & Wilson, Ian: *Pain Threshold Differences Among Contact and Non-Contact Play Athletes* [(1:15) (P2)] Pain and injury are often a consequence of sports play. In addition, the likelihood of experiencing pain and injury increases as physical contact among athletes increases. Research has shown that previous experience with pain has a desensitizing effect on pain threshold and tolerance. Such a desensitizing effect is also more prevalent among contact sports athletes than non-contact sports athletes. The present study assessed differences in pain threshold and tolerance among a variety of athletic teams. It also assessed athletes' recent injuries, the amount of pain associated with the injuries, and the amount of pain it would take to stop the athlete from practicing and competing. Athletes participating in contact sports rated their pain as less severe and had a greater pain tolerance than non-contact sports athletes. Physical and temporal demand, and level of frustration, were lower for high-contact sports. Level of aggressiveness was greater in the high-contact sports, however, an analysis of co-variance using aggressiveness as the covariate did not alter the outcomes of the pain threshold and tolerance measures. These results provide support for the role of physical contact on desensitizing athletes to pain. A significant difference currently exists between the amount of pain required to stop practicing and the amount of pain required to stop playing. Athletes are more willing to compete while injured and in pain, thus potentially compounding and worsening their injuries. Such results indicate a need for additional intervention and education concerning adequate injury healing time.

Hall, Denice: *Inmate-Animal Programs: A Case Study* [(10:05) (1C) (ASC-215)] Almost every state, as well as the federal government, has a program within one or more of their prisons that involve animals. The goal of these programs is to help inmates learn compassion and skills related to their reintegration into society upon release. However, very little research has been done into the validity of these claims. Using a case study of the Belmont Correctional Institution in St. Clairsville, Ohio, as well as a thorough investigation of the literature, this study takes a systematic, scientific look at the potential benefits and disadvantages of correctional programs involving inmates working with animals.

Hansen, Lauren: *Effects of Nicotine on D. melanogaster as a Means of Artificial Selection* [(1:15) (P5)] *Drosophila melanogaster* is a model organism used to illustrate the profound effect chemical agents exhibit in regards to directing artificial selection within a population. Selection, natural or artificial, directly depends on the phenotype of the individual, which is determined by the genotype. Selection occurs when one genetic variation is favored over others; increased frequency of the selected variation indicates a change in the population. Genetic selection is observable through resistance to nicotine, an inherent toxin to the species. The LC50 (10-2.8 M) was determined and survivors were subjected to incremental increases of nicotine concentration (e.g. 10-2.75 M, 10-2.7 M). Currently, research is still in progress to obtain a population of *D. melanogaster* which is statistically different in nicotine resistance than a control population. Recording the effects of toxin exposure will demonstrate that future generations adapt and resist a dosage of nicotine exposure that is fatal to the unexposed flies. The resistant organisms display the natural process by which a genetically selected population can emerge from environmental pressures.

Hanson, Miranda: *AFAP-110 as a Potential Binding Partner for the p85 $\alpha$  subunit of PI3K* [(1:15) (P3)] Increased levels of signaling proteins such as Src, protein kinase C $\alpha$  (PKC $\alpha$ ), and phosphatidylinositol-3 kinase (PI3K) lead to the formation of malignant tumors. More specifically, high levels of Src and kinase activity have been observed in several cancer types, such as breast, lung, ovarian, neural, and brain. PI3K is a protein that has an essential significance in cell function regulation, which includes growth and survival, aging, and malignant transformation. The actin filament-associated protein of 110 kDa (AFAP-110) is an adaptor protein that links the signaling proteins Src and PKC $\alpha$  to actin filaments. While it is certain that Src, PKC $\alpha$ , and AFAP-110 are binding partners, it is unknown whether AFAP-110 is a binding partner of PI3K; however, it appears that PI3K is present while these proteins are interacting. The purpose of this study is to determine whether AFAP-110 is a binding partner of PI3K. If they are indeed binding partners, it is hypothesized that AFAP-110 is responsible for cellular localization of PI3K, which may lead to tumor growth. Determining the interaction of PI3K with AFAP-110 may lead to the manufacturing of a chemotherapy drug. In order to address this question, GST-tagged fusion proteins were generated and purified. Following removal of the GST-tag from AFAP-110, affinity absorption was performed using the purified fusion proteins with GST-cSrc SH3 as a positive control and GST alone as a negative control. From these results, it is predicted that AFAP-110 might be a functional binding partner for PI3K; however, further in vivo studies must be performed.

Kratzer, D.F.: *The Emergence Of The Artist* [(11:35) (2C) (ASC-215)] 'The Dead', A Portrait of the Artist as a Young Man, and Ulysses, by James Joyce, are bildungsroman narratives focused on the development of the Joycean protagonist, recording 'his own progressive rejection of his environment' [and] 'his emergence as an artist' (Daiches 198). In 'The Dead', Joyce establishes the major theme of his works: the development of the protagonist as he rejects his environment, realizes his need to escape the society he rejects, and through exile is able to fly beyond the constricting world around him to emerge as a god-like artist. In 'The Dead', Gabriel Conroy rejects his environment and realizes his need to separate from the paralyzed world he lives in; moreover, Gabriel's pathetic moment of epiphany, at the end of 'The Dead', establishes the Individual's need to transcend society to truly escape, as his soul seems to float over Ireland. Though many other characters in Dubliners have similar experiences, Gabriel becomes a prototype for Stephen Dedalus, in A Portrait, because the concept of flight, as at the end of 'The Dead', figures prominently in Joyce's later works. Because Gabriel is unable to truly fly from the 'bad business' (O'Neill 386) of Ireland, Joyce creates Stephen Dedalus, in A

Portrait, to establish the closure 'The Dead' lacks. In *A Portrait*, Stephen grows as an individual, rejecting his environment and founding his artistic idealism. At the end of *A Portrait*, Stephen flees Ireland, but remains self-centered and proud; therefore, Joyce places Stephen back in Ireland, in *Ulysses*, after his mother's death that occurs a short time before the beginning of *Ulysses*. Stephen's return to Ireland establishes that he has not freed himself of all the nets that keep him from artistic freedom. Ultimately, Stephen becomes more than a 'defiant hero' (Morse 1034), overcoming the history that haunts him, symbolically emerging as the god-like artist: Stephen becomes an apostle for art, a manifestation of the true artist.

Kratzer, D.F.: *Two Shovels* [(2:50) (3C) (ASC-215)] A play about two gravediggers, who are trapped within the absurdity of life. Neither truly understands the world in which they live and its absurd nature, but attempt to reach some understanding of it. At its core, "Two Shovels" is a tragedy focused upon the "weltscherz" (worldly pain) inflicted on man, distinguishing the difference between one what is called to do and what is acceptable within society.

Lipniskas, Julia: *The Effects of a Protein Supplement on Skeletal Muscle Mass* [(1:15) (P6)] Protein is a major component of muscle and serves as a source for physical power; therefore, it endures rebuilding. To allow the muscle to grow and repair from training, muscle protein needs to be synthesized at a rate greater than it is broken down. Amino acids derived from protein serve as precursors for muscle protein synthesis. It is possible that supplementing the diet with protein, the amino acids from the protein could help to repair essential tissue and to form new tissue. The purpose of this study has been to determine whether or not consuming a protein supplement would increase muscle mass. Twelve athlete volunteers from the Wheeling Jesuit University Cross Country and Track & Field teams served as subjects for the study. Measurements for body weight, percent of body fat, and muscle circumference were taken for each subject on a biweekly basis for twelve weeks, beginning in November 2004 and ending in January 2005. Subjects were randomly categorized into three groups; a control, short term consumption, and long term consumption. Results have shown that all three measurements remain consistent throughout the study for each of the three groups; therefore, given the amount of protein supplement consumed per day, and the duration of the study, the protein supplement had no effect on skeletal muscle mass.

Mathies, Heather: *On-site Mission at the CLC: Accessibility for Physically Handicapped* [(10:45) (1C) (ASC-215)] How Can the On-site Mission at the Challenger Learning Center Be Made More Accessible to Physically Handicapped Students? The fast-paced learning environment at the Challenger Learning Center (CLC) can be very exciting for a young child, but how is the experience for a student with a physical handicap? This research will attempt to answer that question by exploring accessibility to the CLC for a student with a physical handicap. This research will also enable me to make recommendations that will improve the on-site mission experience for these students. The main goal of my this research at the CLC is to identify methods to facilitate learning for students with physical disabilities, who are participating in an on-site mission. By exploring past and present on-site missions, I will be able it will be possible to identify the potential to enhance the level of accessibility provided for students with a physical handicap. I will use This information will be used to suggest cost and no-cost accommodations and preventive measures that will improve their overall mission experience. These recommendations will be presented to the flight directors who conduct the missions and the teachers preparing the students before a mission. These recommendations will benefit not only the flight directors who conduct the missions and the teachers who prepare the students, but will also benefit the students who will be able to experience unlimited participation in a once limited endeavor.

McCombs, Kristin: *Cold War Science: Radiation Experimentation and the Fernald School for the Feeble-minded* [(11:55) (2A) (ASC-212)] While at first glance the Fernald studies seem to be about the nutritional value of oatmeal, it becomes clear upon examination that the research can be connected to extensive Cold War radiation experiments. Such research helps to explain trends in science during the Cold War and displays how a disadvantaged population could be targeted at the hand of the government. This project attempts to show how the children institutionalized at the Fernald School for the Feeble-minded were exploited and how the United States government may have been instrumental in allowing such unethical research to occur by specifically examining the experiments performed and the manner in which such studies can be connected to the greater scheme of government-sponsored scientific research during the Cold War. In the critical battles occurring with the Soviet Union and communism, the United States could not risk scientific inferiority. Accordingly, the United States government was making substantial funding available for various experiments for scientific exploration. Such experiments varied throughout the United States and by institution, and involved everything from fertility to neuroscience to the nutritional values of various products. Throughout the Cold War, several agencies, including the Atomic Energy Commission and the Defense Department, used radiation and other techniques to test their effects on human guinea pigs whether or not the subjects realized they were being utilized for experimentation. One of these projects to develop was that at the Fernald School, which involved the use of mentally handicapped individuals and the study of the nutritional value of oatmeal without their consent.

McCombs, Kristin: *Metacognitive Self-Regulation and Argumentation Skills as a Function of Technology-Based Instructional Methods* [(9:45) (1C) (ASC-215)] Past research has suggested benefits of scaffolding as an instructional method. Such methods serve to aid students' learning and understanding of concepts by facilitating cognitive processing, serving as an adjunct to information processing and providing an effective means for assisting in the communication of new knowledge. Multiple studies have shown that the implementation of such scaffolding techniques can enhance student learning, comprehension, and metacognition (thinking about one's own cognitive processes). The present study examined the ways technology-based instructional methods influence high school students engaged in a social studies curriculum. Using the Foundations of Freedom instructional DVD-ROM about the United States constitution, a product developed at the NASA-Sponsored Classroom of the Future, as the content, participants were placed either in a planning group and exposed to a software feature which guided their summarization skills or in a no planning group that allowed access to Microsoft Word. Participants completed a pretest and posttest assessment of their knowledge about the constitution, as well as an instrument measuring their metacognitive skills. Student responses will be analyzed to determine whether metacognition and student performance were enhanced by the summarization software experience. Significant improvements are expected for students who have low metacognition scores and use the summarization feature. A larger objective is determining whether the use of multimedia, planning, and metacognitive self-regulation pedagogical techniques should emerge as the definitive methodology for increasing student aptitude for historical topics and argumentation. Lastly, this experiment aims to provide recommendations for optimizing student performance for future history-based software programs.

McMahon, Heather: *An Examination of West Virginia's Mental Health Court Program* [(9:45) (1A) (ASC-212)] The purpose of this research is to examine West Virginia's Northern Panhandle Mental Health Court Program (MHCT). MHCTs are promoted in order to respond to the increasing number of people with a mental illness entering the Criminal Justice System. MHCTs are relatively new specialty courts with no accepted universal definition, yet there are thirty courts currently functioning in the U.S. In 2000, Congress authorized a MHCT

demonstration program and identified at the time that Mental Health Courts have the potential to address the criminalization of those people who have been diagnosed with a mental illness. Thus, a pilot program began that could serve those with a mental illness better than the current system. MCHTs will divert those with a mental illness around the traditional CRJ system to avoid criminal sanctions and provide them with the services and rehabilitation needed. MHCT is a voluntary program in which entry can be gained based on the severity of the crime, type of diagnosis, and psychological screening; participation in the program can be relinquished at any time and the case then diverted back to the CRJ system for criminal sanctions. This study is a descriptive study of West Virginia's MHCT Program and will provide information on the court, referrals to the court, intakes, court proceedings, diagnoses accepted, predominant diagnosis, and recent graduations from the program. Due to the length of time West Virginia's MHCT has been in existence, no statistical data concerning the court has been recorded.

Melody, Kevin: *Effects of Pesticides on Early Zebrafish Development* [(3:50) (3A) (ASC-212)] Over the past century, the consequences of human land management have come into question, especially the use of pesticides such as atrazine and methoprene. Runoff from chemicals and pesticides poses an enormous environmental hazard to both aquatic fauna and human health, especially if low dose responses are not known. For example, atrazine and methoprene have both been linked to frog deformities such as hermaphroditism and limb deformities, respectively. The focus of this study is to observe the effects of these pesticides (based on availability) on zebrafish embryological development. Embryos will be exposed to the pesticides and observed for three days in order to detect any adverse effects of low dose exposure. The results of this study can be extrapolated as potential threats to fish populations in the wild. Results are pending experiment completion; however, it is hypothesized that potential deformities will not be detectable at such an early stage of embryological development.

Missick, Michael: *Nitrogen Deposition: Effects on the Stoichiometry, Biomass, Density and Taxa Diversity of Aquatic Macroinvertebrates* [(2:50) (3A) (ASC-212)] Nitrogen deposition in watershed ecosystems is a phenomenon that can be accounted for in part by the use of agricultural fertilizers on farmlands. The runoff containing the ammonia-based fertilizer oftentimes becomes deposited into nearby ponds. The effects of increased nitrogen deposition on the stoichiometry, biomass, density and taxa diversity of the aquatic macroinvertebrates inhabiting these ponds was analyzed. Ten ponds were selected randomly using aerial photographs. Macroinvertebrate samples were taken from five ponds that had significantly higher background nitrogen levels than ordinary and five ponds were sampled with lower nitrogen levels. The macroinvertebrates were analyzed for their carbon to nitrogen ratios. It was found that with increasing nitrogen levels in the ponds, the percentage of nitrogen in the species was increased and the percentage of carbon was lowered. Taxa diversity, biomass and density also increased with increased nitrogen deposition.

Pelikan, Katherine: *'Lights, Communism, Action!': Cold War Fears Realized on the Big Screen* [(11:35) (2A) (ASC-212)] The Cold War is one of the defining events of the twentieth century. With a duration of almost half a century, it left behind a perhaps immeasurable legacy. The Cold War also affected the pop culture of the era. Movies are an excellent way to look back at the culture of a time period since they often reflect the thoughts and feelings of the people. Since the beginning of the movie making industry, films have been used not only as entertainment or moneymaking endeavors, but also as political propaganda. An analysis of the movies, 'Big Jim McLain', 'The Manchurian Candidate', and 'Dr. Strangelove or How I Learned to Stop Worrying and Love the Bomb' show the evolution of American fears from that of domestic communism, to that of communist infiltration, to that of nuclear proliferation and all out nuclear war respectively. While movies are created as entertainment and moneymaking

endeavors, they are also created in response to the thoughts and feelings of the American people. They are sometimes used as political propaganda, sometimes used simply to convey the feelings of the time, or sometimes used as a tool to change the minds of the American people by playing off their fears. Through an in depth analysis of these three movies, it has been shown that they best exemplify the above fears while bringing them to life on the 'Big Screen'.

Pelikan, Katherine: *Modernization Theory and Changing Ireland: A Case Study of Irish Travelers* [(10:25) (1A) (ASC-212)] Irish Travelers are a distinctive subculture within Ireland who have their own traditions, customs, and language. In pre-modernized Ireland, the Travelers occupied a specific niche in the rural Irish economy. They provided goods and services that were not easily accessible to the country population. Since the end of World War Two, the traditional aspects of their culture and even their existence as a separate people within Irish society have become a major issue of debate. The question to be looked at is, has Irish Modernization created radical and unwanted cultural changes for the Irish Travelers? When looking at the changes that the Travelers are facing, Modernization theory offers some answers. This theory is usually applied to Third World countries with traditional societies which were gaining independence from colonial powers and beginning the process of modernization in the twentieth century. However, the theory is applicable to Ireland because it too was beginning the process of modernization after decolonizing in 1921. The process and extent of modernization was looked at to see if Ireland experienced certain modernization expectations. One can see that the Travelers and their culture have come into question as a distinct subculture and are facing radical changes and issues because of the modernization process that has been ongoing since the 1960's.

Reindel, Rebecca: *A Forensic Entomological Collection of Postmortem Species' Variation in Wheeling, WV and the Effects of Nicotine on Flesh Fly Development* [(1:15) (P11)] Forensic entomology uses insects to determine postmortem interval (PMI), or time of death, of an individual. Studies have shown that insects that feed on carrion material arrive at a predictable time after death, providing a general timeline of the number and variation of species involved in entomological criminal cases. One of the earliest and most common insects to visit carrion is the flesh fly, family Sarcophagidae. Average flesh fly development has been previously determined by rearing flesh fly larva (found on carrion) into adult flies in the laboratory. This organized method for the determination of the postmortem interval is appropriate for carrion material under normal conditions. However, the presence of a toxin in the carrion has shown to alter the rate of development of the insect larvae, and therefore alter the postmortem interval. The purpose of this study was to provide a sample collection of common insects found on carrion in Wheeling, WV, as well as use nicotine-injected carrion to determine the effects of the toxin on flesh fly development and mortality. Nicotine is an alkaloid used in the production of tobacco and may be implicated in addictive behavior in humans. Birds were injected with a nicotine solution, and then used as carrion food for flesh flies in the laboratory at various rearing temperatures. Experimental forensic entomological data is necessary for criminal cases involving insects in order to provide a standard for specific case data references.

Romano, Emilee: *Hope Promotes Motivation in Appalachia* [(1:15) (P8)] In commitment to servant leadership in the mountain state, the Clifford M. Lewis Appalachian Institute at WJU launched a 'hope' listening project to ensure that every voice could be heard, to ask proper questions so that ideas were recognized, and to respond to Appalachian voices. The 'hope' project aims to realize the Institute's visions of: problem analysis, serving as a listening presence, and making research available for the purpose of empowerment. To determine what gives Wheeling and state leaders hope in the face of challenges (economic, social, political) and to engender hope in communities especially among youth, the project aimed to identify reoccurring themes regarding hope. Beginning with a 'hope' inventory wherein different forms

of hope (theological, social, practical) were analyzed, those findings in conjunction with community concerns, resulted in a survey designed to collect a consensus on hope from Appalachian people. Identified themes imply that people: are hopeful through God and spirituality, use hope to envision the future, implement goals based on their levels of hope, base life expectations on hope, base their motivation on hope. To uplift communities, the Institute can launch projects that instill and sustain hope. This research allows the Institute to refine the survey for frequent regional use in after-school programs and other community-sponsored agendas. Collaboration with organizations (such as the Diocese of Wheeling-Charleston Catholic Committee on Appalachia) to promote advocacy in Appalachian regions will also occur.

Romano, Emilee: *The Great American Voice: A Study in the Definition of Americans* [(11:55) (2C) (ASC-215)] Together Mary Rowlandson's *A Narrative of the Captivity and Restoration* and Thomas Paine's 'Crisis Paper No. 1', set the assimilation standards to which people were expected to conform in order to be accepted by the 17th and 18th Century cultures respectively. Though written almost a century apart, both pieces of occasional literature exhibit didactic elements that teach readers proper behavior for the then-contemporary culture. Supporting research comes from various literary criticisms and journals including: *The William and Mary Quarterly*, *American Literary History*, and *American Quarterly*. Though the proper behavior outlined in each work varies slightly based on contemporary events, important principles taught in each are parallel. Both call for Americans to be loyal to God, brave in the face of battle, and in constant quest for self-improvement (i.e. slave to free, pagan to pious). In their works, both Rowlandson and Paine, though perhaps unbeknownst to Rowlandson, call people to adhere to a certain standard and thus define what it is to be American.

Rossetti, Ashley: *Inter and Intra Species Striking Behaviors and Prey Capture In Ball Pythons* [(12:15) (2B) (ASC-213)] Snakes mainly fall into two different varieties largely determined by their lifestyle with regard to eating habits and thermoregulatory behavior. A snake may be an active forager meaning a snake that actively hunts its prey, or conversely, a snake may be an ambush predator that is mostly inactive, relying on prey to wander across its path. The purpose of the proposed study was to correlate the striking behaviors and prey capture methods of two different species of snakes, ball pythons (*Pythoninae regius*) and king snakes (*Lampropeltis*). It is hypothesized that the different foraging methods of the snake species will largely determine striking behavior. The more primitive species, such as the ball python, show little variation in prey capture technique and pre-striking behavior; a less primitive species will behave according to prey situations by varying methods of prey capture. In analyzing striking behavior using video capture, three characteristics of coil application were documented: coil composition, twisting pattern, and application movement. Other characteristics were observed in addition to coil applications, to give a more comprehensive descriptive portion to the study. These behaviors included pre-strike behavior and orientation, jaw placement, doubling back, number of loops, time of constriction, ingestion direction, and prey immobilization strategies.

Schultz, Krystal and Hickman, Elisa: *Wheeling Jesuit University's Psychology Program: BA or BS?* [(1:15) (P9)] In an effort to discover the differences in psychology programs offering BA and BS degrees, the authors studied the psychology departmental criteria listed on line in the 28 Jesuit College and Universities in the United States. Results showed that 12 schools offer only a BA in psychology and that 11 schools offer a BS (some of which also offer a BA). The other 5 schools did not indicate the type of degree offered. An analysis of the number of hours of science and math required at the BA and BS schools showed that the mean for the BS schools was 24.5, and the mean for the BA schools was 9.6. Schools offering a BS require more science and math hours than schools offering a BA,  $t(24)=-6.38, p<.001$ . When compared to

other Jesuit schools, the curriculum of WJU (having 18 hours of science and math) is most similar to the schools that offer a BS.

Tartamella, Chris: *Determining the X-Ray Variability of Quasi-Stellar Objects* [(3:10) (3B) (ASC-213)] X-ray variability is a defining characteristic of Active Galactic Nuclei (also known as QSOs or quasars). Quantitative analysis of this variability has been difficult due to low signal-to-noise ratios and short time baselines, but data acquired within the last four years with NASA's Chandrasekhar X-Ray Observatory (Chandra) have opened the door to such analysis. By cross-correlating the online Chandra archives with known quasar catalogs on NASA's High Energy Astrophysics Science Archive Research Center (HEASARC) website, a subset of observed quasars was assimilated. Lightcurves of these objects were created using software from the Chandra X-Ray Center and analyzed using three different statistical methods. The Kolmogorov-Smirnov test (KS test) was used to probe departures from constant brightness. The unavoidably small number of datapoints and the simplistic nature of the test make it impossible to establish a high confidence in the variability. The chi-squared test was more useful in demonstrating variability, but the lack of a known theoretical model for this variability reduces its usefulness. The autocorrelation was also applied to determine whether visible variability was real or merely statistical noise. This test was able to confirm that noticeable variabilities in the lightcurves were real even with the small number of datapoints available. In future work, more sophisticated analysis based on Fourier series and power density spectra are more likely to yield better results.

Westfall, Laura: *Eyewitness Testimony: A Measure of Accuracy and How it Relates to Time* [(10:05) (1A) (ASC-212)] The following experiment attempts to determine whether the passage of time harms a person's ability to accurately describe an event. The event under study was a student that took up about three minutes of a class by interrupting in the middle of it in order to write something on the board that does not make any sense. At some point after she leaves the classroom, the students answered a general questionnaire about the student. Some classrooms received the questionnaire 20 minutes after the incident while the others received it in the next class or at the beginning of the following week. This experiment takes time into effect to see if the eyewitnesses are accurate when answering the questionnaire. Being accurate when answering questions is important because sometimes it is only the eyewitness that is able to tie the criminal to the crime scene. If the eyewitness were not as accurate as he or she could be then the criminal would have a better chance of remaining free on the streets and therefore making the whole criminal justice system suffer.

Williams, Kirstin: *Brot, Bob, and Julia: Exploring Fractals* [(2:50) (3B) (ASC-213)] Fractals are complex geometric figures that model objects in nature such as ferns, coastlines, etc. The Mandelbrot set is one of the most complex mathematical fractal images. Recently, researchers have begun to explore the Mandelbob set, which is a slight variation on the Mandelbrot set. The Mandelbob set is found to produce new and interesting patterns under close examination. Both sets of fractals relate back to their underlying Julia sets, another type of fractal. This presentation examines the relationship between the Mandelbrot and Mandelbob sets of fractals within pictures and math. It further explores the ultimate ties to their Julia sets.

Zambito, Angela: *Greece is the Word: The Debut of American Containment* [(11:15) (2A) (ASC-212)] The debut of the containment policy, which dominated American foreign policy for about three decades, occurred with American intervention in Greece during the third phase of the Greek Civil War in 1947. Although, as a result, Greece did not fall into the Soviet sphere of communist satellites, research led to the conclusion that the intervention was poorly executed and bore unfortunate results for the Greek people. American intervention was a hasty reaction

to the British withdrawal of aid, the Soviet threat, and the American interests in the Middle East. The Truman administration failed to recognize the dynamics of each factor and in the Truman Doctrine reduced the cause of intervention to the inherent need to contain communism. Through this simplification of the complexities within the Greek situation to a Soviet threat, the Truman administration was able to galvanize the support of Congress and the American people and also acquire massive economic funding for the support of Greece and Turkey. As a result, Greece was the first civil war episode in which containment was applied. American intervention in Greece ended with the annihilation of the leftist opposition; however, it laid the foundation for 30 years of right wing domination in the Greek political scene, rather than the creation of democracy, which Greece yearned for since their struggle for independence from the Ottoman Empire in the early 19th century. The dynamics of the factors that led to the abrupt intervention will be examined.