

April 29, 2011
Harris Commons
Spencer Hall

Oral Presentations:
2:00–5:00 PM
Poster Presentations:
3:00–5:00 PM

SCHOLARSHIP SEWANEE

**The annual celebration
of student scholarship**

**Posters and other visual presentations
from all fields, including independent studies,
class projects, and community-based projects**

SEWANEE
THE UNIVERSITY OF THE SOUTH

WELCOME

Welcome to Scholarship Sewanee, a campus wide celebration of student scholarship and creative activity. The mission statement of the Undergraduate Research Initiative is

"To enhance student engagement, critical thinking, and problem solving through meaningful intellectual student-faculty interaction, every student and faculty member will have the opportunity to engage in collaborative research or creative work in a vibrant and encouraging environment supported by the University as a whole."

Scholarship Sewanee is an important part of this mission as it provides an important opportunity to recognize the outstanding work of students across campus, as well as the faculty and staff that make such work possible through their commitment as mentors, sponsors and guides in the scholarly process. In many ways, scholarship is not complete until it is disseminated to others, so thank you for joining in the culmination of the students' experience and celebration of their accomplishments.

Events such as this are only possible through the contributions of numerous generous benefactors. The following people and groups are gratefully acknowledged for making Scholarship Sewanee possible:

- Walter and Mayna Nance
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- The Undergraduate Research Advisory Committee
- The Office of the Dean of the College
- Physical Plant Services
- Tammy Elliott
- Print Services

Thank you!

POSTER PRESENTATIONS

ABSTRACT 1

Sculpting Sound: Electronic Music Projects

Ijeoma Anyanwu, Caroline Crider, Cain Green, Ben Haggerty, Charles Hughes, Cameron Jefts, Samuel Martin, Nicholas Pusateri, & Peter Schutt

Musc 214 – Electronic Music: Synthesis and Digital Recording (Dr. James Carlson)

Technology largely shapes the music we hear every day. The use of music synthesis in techno and ambient music are the most obvious examples, but sampled sounds, MIDI and digital recording techniques are often used for all genres whether the listener knows it or not. The students of MUSC 214: Electronic Music will present introductory information about the many things they have learned this semester, including the many virtual instruments in Reason software and the digital recording software ProTools. Student presenters will also be hosting listening stations at which the public can hear the music they recorded this semester. These projects range in style from avant-garde techno to acoustic folk and evidence a considerable mastery of some very powerful technological music-making tools.

ABSTRACT 2

Vernal Pools I: The Effect of Roads & Pond Depth on Pelagic Invertebrate Communities

Keri Bryan, Jonathon Tyson, Margret Shipley, Trevor Mia

Biol 210 – Ecology (Dr. Deborah McGrath)

Roads have been shown to have negative impacts on natural ecosystems, especially fragile environments such as vernal pools. The effect of road salts on shallow forest pools may extend 200 to 1500 meters, producing negative effects on vernal pool amphibians and invertebrate fauna. Research also shows that vernal pool depth is positively correlated to species richness of flora, suggesting that this trend may also hold for pelagic fauna. We investigated diversity and abundance of vernal pools and hypothesized that conductivity, used as a measure of the effect of road salts on vernal pool chemistry, would be associated with decreased pelagic abundance, species richness, and Shannon Weiner diversity, whereas all three of these variables would show a positive correlation with pool depth. Using a plankton net, we sampled pelagic diversity in six vernal pools near Sewanee, TN, three of which were located near paved roads while the other three were surrounded by hardwood forest away from roads. Vernal pool depth and conductivity was measured weekly over six weeks using a Quanta Hydro water probe (n=5). We compared mean pelagic abundance, species richness, and diversity as measured with the Shannon Weiner Index between the three ponds with the highest and lowest conductivity, and between the three shallowest and deepest ponds. We found no significant correlation between conductivity and pelagic fauna of vernal pools. Our results indicate no significant effect of depth on community diversity or on total pelagic abundance; however, morphospecies richness was significantly higher in deeper vernal pools than in shallower ones. These results suggest that the effect of paved road salts on the vernal pools had no significant effect on the pools species abundance or diversity. Rather, the depth of the vernal pools affected the pelagic species richness more than the other abiotic, vernal pool characteristics tested.

ABSTRACT 3

Vernal Pools II: The Influence of Road Salt on Benthic Vernal Pool Communities

Patrick Dienzo, Sierra Hayes, Ripal Patel, & Patrick Vestal

Biol 210 – Ecology (Dr. Deborah McGrath)

Vernal pools are temporal bodies of water that provide habitat free of fish predators for diverse microinvertebrate communities, including microcrustaceans, such as fairy shrimp and copepods. Studies have shown that proximity to roads has negative impacts on vernal pool communities. This study explores the influence of roads, specifically road salt runoff, on benthic diversity and abundance. Water properties and their influence on benthic communities were investigated in six ephemeral pools in Sewanee, Tennessee, three of which were surrounded by paved road. We hypothesized that benthic abundance and diversity in vernal ponds adjacent to roads would be reduced. As a measure of the impact of roads measured water conductivity, pH, and turbidity weekly determine if these properties differed among ponds surrounded by forest or paved roads. Benthic diversity was sampled five times over six weeks. Roads did not have a significant effect on pond conductivity, pH, or turbidity among the ponds; nor, did they have a significant influence on benthic abundance and diversity. We did find that there was significant temporal variation in

abundance and morphospecies richness over the span of six weeks. We hypothesize that weather-related influences, such as precipitation and temperature, that vary considerably between late winter and early spring, may be a primary influence on benthic abundance and diversity.

ABSTRACT 4

Vernal Pools III: Phenology of Spotted Salamander Egg Laying

Katie Wakefield, Callie Sadler, Thao Bui, & Alexandria Higdon
Biol 210 – Ecology (Dr. Deborah McGrath)

Ephemeral ponds serve as predator-free habitat for larvae of several amphibian species that would otherwise be consumed by fish. These temporary pools also contain a variety of crustaceans that provide food for growing salamander larvae. Adult spotted Salamanders (*Abystoma maculatum*) live underground but undergo mass migration to ephemeral ponds to lay eggs during late winter and early spring. Surveys of these egg-laying events demonstrate that there is a relationship between weather cues and spawning events. We studied the phenology of spotted salamander egg laying in seven vernal pools on the Sewanee domain. We hypothesized that egg masses would be more abundant after a rise in temperature and an increase in precipitation. We also compared egg laying among the seven ponds and with data collected in 2010. We counted the cumulative number of egg masses weekly in all seven ponds for six weeks in late February through the end of March 2011. We found that precipitation events and cooler maximum temperatures occurred before the major spawning events. Total egg mass numbers varied greatly among the seven ponds, with the highest number occurring at the end of Brakefield Road. Egg mass totals from the present season were considerably higher than the totals for 2010. These results demonstrate that there is a relationship between weather patterns and Spotted Salamander spawning events on top of the Plateau, but that the number of egg masses laid varies considerably by pond and year, perhaps due to unstudied factors such as resource abundance.

ABSTRACT 5

Vernal Pools IV: Effects of Depth & Temperature on Pelagic Community Composition

Ian Hazelhoff and Erica Teasley
Biol 210 – Ecology (Dr. Deborah McGrath)

Vernal pools are temporary wetlands that form in geological depressions, primarily during winter/spring and dry up during summer/fall. These are unique environments in that they are home to a variety of organisms that have adapted to survive the drying and refilling cycle each year. Since the pools are temporary and depend on rainfall, the resulting community structure is potentially subject to change over time. Varying depth levels, as well as ambient temperature shifts are common to vernal pool ecosystems. The objective of our study was to look for correlations between pelagic morphospecies abundance and diversity and abiotic environmental factors at six locations. We hypothesized that vernal pool depth and temperature would affect pelagic morphospecies abundance and diversity over time. Copepods were the most abundant organisms, and decreased in numbers over time. Ambient temperature was positively correlated with copepod abundance, whereas there was no clear correlation between depth and copepod abundance. Overall morphospecies diversity for all ponds was negatively correlated with temperature.

ABSTRACT 6

Fire on the Mountain: Will our Oak Respond?

Bestor Ward, Forrest Hogsette, & Clay Schutte
Faculty Sponsor/Mentor: Dr. Ken Smith, Forestry & Geology

In 2010, prescribed fire was used following tree thinning at two sites on the Domain in an effort to promote oak regeneration. In compartment 46, fire was applied to the site in April and May 2010 and post-treatment seedling cover was estimated in the fall of 2010 in twenty permanent plots. Six months after thinning and prescribed fire, sassafras, oak, and pine seedling cover dominated the plots at 28%, 17%, and 12% cover, respectively. Thinning and prescribed fire increased oak seedling densities from 4000 to 8400 seedlings per acre. In terms of non-tree cover at Compartment 46, *Vaccinium* and native grasses dominated at 30% and 7%, respectively. At Compartment 6, which was thinned in 2006, three ½-1 acre openings were burned in April 2010, and tree seedling densities were estimated in the fall of 2010 at

18 permanent points. Of all tree species present on the site, oak (5 species) were present at the highest densities (10,600 per acre), and oak densities have increased compared to a 2009 inventory of the same plots. Although the combined use of tree thinning and fire has increased oak seedling densities at both compartments, the future use of fire at both sites will likely be required to maintain high oak seedlings densities for the next several years.

ABSTRACT 7

The Excitement of n-point Win-by-k Games

Anna Tracy

Faculty Sponsor/Mentor: Dr. Doug Drinen, Mathematics

Even in the heat of the game, some points are more important than others. When opponents have equal scores, everyone is on the edge of their seat to find out who will score the next point. Mathematically, the overall excitement of the game can be found by adding up for each possible state in the game, the probability of reaching that state times the leverage of that state. Not all games have the same excitement level. If a player must win n points and beat his opponent by k points, the choices of both n and k will affect the overall excitement of the game.

ABSTRACT 8

Challenges & Resources of Survivors of Domestic Violence

Sarah Clark

Faculty Sponsor/Mentor: Dr. Sherry Hamby, Psychology

Advocacy for battered women often focuses on physical danger, but more attention needs to be paid to other familial, financial, and emotional risks. Research to date has likewise paid little attention to victims' strengths and resources that can help with coping. 103 women from two sites in two southern states provided their perceptions of their risks and resources in a semi-structured format. Site 1 included current and recent shelter residents; Site 2 was a community support group for battered women. Although the risk of physical danger was reported by almost half (48%) of the sample and nearly 1 in 6 (16.5%) reported a fear of being murdered, many other risks were common. Concerns about children's safety and wellbeing were reported by 43%, financial security issues by 53%, lack of social support by 44%, family rejection by 27%, and fear of losing custody by 27%. Despite the high reports of lack of social support and family rejection, family and friends were nonetheless two of the most commonly reported strengths (54% and 42%). Having faith (46%) and their church community (49%) were also commonly mentioned, as was having a job (40%). Implications for improving risk assessment and safety planning will be presented.

ABSTRACT 9

Cyberbullying: The New Way to Bully

Sarah Clark, Caroline Dashiell, Elly Farrell, Cathy Lambert, Laura Logan,

Johanna McManus, Caitlin McNaughton, & Matney Rolfe

Psyc 363 – Adv Research Seminar in Psych (Dr. Sherry Hamby)

OBJECTIVE: To identify up-to-date trends in cyber-bullying and highlights the risks, consequences and contexts of cyberbullying in 2011. **METHOD:** We held four focus groups lasting approximately one hour each. A total of 45 undergraduates participated (14 males, 31 females) in groups ranging from 9-13 members. Three groups were single gender (1 all male, 2 all female) and one was mixed gender. Group members were provided refreshments. **RESULTS:** Grounded theory analysis was used to identify major themes in the transcripts. Major themes included: 1) Cyberbullying is easier than face to face bullying because it is less personal and more indirect, 2) Cyberbullying is minimized as a problem, 3) Using technology is seen as essentially consenting to cyberbullying; 4) Sometimes cyberbullying has serious consequences, and 5) There are steps you can take to partially protect yourself. **DISCUSSION:** We hope to use these themes and the examples provided in the focus groups to develop a survey to assess the prevalence of this phenomenon. Cyberbullying has serious implications that are often under-recognized. The more we know about the severity and the effects of cyberbullying the more we can find ways to prevent it.

ABSTRACT 10

Purification of and Kinetic Properties of L-Histidinol Dehydrogenase

Skip Aymett, Miller Thornbury, & Evans Wellborn
Biol 316 – Metabolic Biochemistry (Dr. Julie Lively)

L-Histidinol Dehydrogenase is a key enzyme in the histidine biosynthetic pathway of prokaryotes. The enzyme catalyzes the final two steps, converting L-Histidinol to L-Histidine through an L-Histidinol intermediate. Competent E-Coli bacteria were transformed with a pTrcHisA plasmid vector with the HisD gene encoded. Double digest and gel electrophoresis verified the gene. The recombinant protein L-Histidinol Dehydrogenase was cultivated using his tagged IPTG induction and the crude product was purified using a nickel gravity flow column. Protein levels were confirmed with SDS-page. The L-Histidinol Dehydrogenase protein concentration will be quantified with a protein assay and the enzyme activity will be measured with a kinetics study determining the change in enzyme activity based on pH.

ABSTRACT 11

Characterization of Triose Phosphate Isomerase

Logan Miller, Callie Crider, & Mary Emily Christiansen, *Biology*
Biol 316 – Metabolic Biochemistry (Dr. Julie Lively)

Triose Phosphate Isomerase, TPI catalyzes the isomerization reaction of dihydroxyacetone phosphate to glyceraldehyde 3 phosphate, two intermediates in glycolysis. TIM is important in cells to create a conversion of DHAP to G3P to allow for one extra step in glycolysis instead of a completely different pathway. In this study the recombinant protein expression was used to extract TPI from Escherichia coli cells. The conformation of the gene's identity was done by restriction endonuclease double digest of Kpn and Xho I. This removed the gene from the vector pTris Hic A. The vector containing TIM was purified from the chemically transformed cells. These cells were also used for IPTG induction. The presence of TPI was confirmed by SDS-page analysis. TPI protein concentration was determined by a Bradford assay in comparison to BSA standard curve. The enzyme assay looked at the reaction of DHAP to G3P coupled with G3P to 1,3 bisphosphoglycerate along with NAD⁺ reduction.

ABSTRACT 12

Reward Preferences at School: Do Children Actually Favor Unhealthy Food?

Hadley Mates [Research conducted with Libba Coker (C'10), Lucy Taylor (C'10), & Karen Yu, Associate Professor of Psychology]

Faculty Sponsor/Mentor: Dr. Karen Yu, Psychology

Childhood obesity is a serious and growing problem in the United States, with almost 1 in every 3 children classified as overweight or obese. Yet in schools and at home, good performance and behavior are often reinforced with relatively unhealthy food rewards. Might children actually prefer healthier rewards that could reduce the likelihood of obesity, such as more nutritious foods, or rewards that involve physical activity? To find out, we administered two questionnaires to 75 boys and 69 girls in 2nd to 5th grade. The first questionnaire allowed us to determine the most preferred rewards from several categories. The second questionnaire paired each of the top healthy and unhealthy food rewards with each of the top non-food rewards, asking children which of two rewards they favored for each question. Across all grade levels tested, the most preferred reward was a *non-food* reward. Thus, there are likely multiple benefits to the use of non-food rewards: a positive impact on children's health and attitudes about food, and stronger incentive to work harder for their preferred reward.

ABSTRACT 13

Distribution and structure of genetic variation in *Ilyanassa obsoleta* (Mollusca: Neogastropoda)

Jia Pan

Faculty Sponsor/Mentor: Dr Kirk Zigler, Biology

The aim of this study was to examine the structure and distribution of genetic variation in *Ilyanassa obsoleta* (Say), an important North American marine gastropod. A portion of the mitochondrial COI gene of 51 individuals from 7 locations (5 on the East coast, 2 on the West) was sequenced and added to an existing database of 100 individuals from 4 other locations on the East coast, extending population sampling from

Florida to New Brunswick, Canada. A site-by-site comparison showed no significant population structure with the exception of one population in New Brunswick that was isolated from the rest. There was also an overall decrease in nucleotide diversity from south to north. The results suggest that there is limited genetic structure within *I. obsoleta*, with significant gene flow linking populations on the East coast save for a few northern populations. Also of note is that populations on the west coast (where *I. obsoleta* is invasive) have similar levels of genetic diversity to those on the East coast, and have not diverged genetically from East coast populations since they were established. The reason for the genetic distinction of the northern populations is unknown, but is similar to patterns seen in other marine organisms in this region, and has been interpreted as indicative of a northern glacial refugium in these species.

ABSTRACT 14

Organic gardening at Sewanee: Examining soil properties at the student garden

2011 Soils & Cultivation class

Faculty Sponsor/Mentor: Dr. Ken Smith, Forestry & Geology

Sewanee's community garden was cleared for agriculture in 1898. The 2011 Soils and Cultivation class utilized the garden's student section this spring, and after clearing overgrowth and establishing raised beds, organic fertilizer was added to each plot on an individual basis. Prior to bed construction, mulch application, and fertilization, our soil analyses revealed an average soil depth of 105 cm and 6.6 pH level. Macronutrient concentrations averaged 116.0, 173.4, 124.4, and 2088.6 ppm for P, K, Mg, and Ca, respectively (0-10cm depths). Soil temperature averaged 3.1, 6.1, and 12.3° C for January, February, and March, respectively. Approximately 20 vegetables were seeded in the greenhouse in February. Transplant and direct seeding occurred on March 23rd, after the last frost. Interest in expanding the University's garden system prompted additional soil analyses in areas near Old Farm Road. The surface soils adjacent to the barn had a pH of 6.2, and P, K, Mg, and Ca values of 61.0, 128.3, 103.8, and 1608.0 ppm, respectively.

ABSTRACT 15

Encouragement & Its Effects on Student's Mindsets & Test Taking Abilities in Sewanee University

Ijeoma Anyanwu, Shameka Jennings, & Lizzie Butler

Psyc 358 – Cognitive Psychology (Dr. Karen Yu)

Individuals are often encouraged with positive, and sometimes negative, instructions before performing any given task. To what extent does the induced mindset of such instructions affect completion of the task as well as the individual's confidence in their ability to perform well in the presented task? In this study, 67 undergraduate students attending Sewanee: The University of the South were given a test of 5 visual illusions and 5 cognitive illusions (brain teasers) as a task to complete. Prior to completing these tasks, the participants each read a set of instructions that included positive, negative, or no encouragement at all. At the end of the study, participants completed a confidence rating scale as well. We hypothesized that the students that were given the positive encouragement would perform better on both tasks and have higher confidence ratings than the negative encouragement group and the no encouragement control group. The results of our study are still pending.

ABSTRACT 16

Land-use & spatiotemporal variation in forest dynamics on the Southern Cumberland Plateau

Sean K. McKenzie

Faculty Sponsor/Mentor: Dr. Jon P. Evans, Biology

The last century has been a time of extreme changes in forest habitats in the Southeastern United States. The southern portion of the Cumberland Plateau has been especially hard hit, with massive alterations of dominant disturbance regimes, multiple introduced tree species and tree pests, and a host of other anthropogenic influences fundamentally altering forest composition. Despite the conservation importance of the region, relatively little work has been done quantifying patterns of composition change at the multiple-decade level, and less has been done to relate these patterns to historical anthropogenic influences. Using historic forest inventory data and timber harvest records, we were able to build a spatial database of historic forest composition and land use from the 1950s to present on the 8,000 acre historic domain of Sewanee: The University of the South. Land use patterns were mapped over the whole domain,

as was historic forest composition. Change in dominant canopy cover was then analyzed, and current composition was related to land use history. Land use history had a significant effect on current forest communities and, along with physical site characteristics, was able to explain a good portion of current forest composition. These findings are discussed in the context of narrative accounts of forest change at Sewanee dating back to the 1900s and scientific investigations of forest change for the Southern Cumberland Plateau in general.

ABSTRACT 17

Beaver Dam Ponds Create Habitat for Aquatic Invertebrates

Joe Kirkpatrick & Sam Murray

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

Beavers are considered ecological engineers that create unique aquatic habitats used by other organisms. However, their dam building brings them into conflict with human landuse. In this study, we hypothesize that ponds behind beaver dams harbor a greater number and variety of species than found in streams without beaver dams. We conducted our study at Lake Dimmick, where beavers are active and causing problems to the integrity of an upstream human dam. We located a beaver pond along a stream draining into Lake Dimmick. We sampled the types of aquatic invertebrates found in the pond using a net and bucket to sample three 1 sq. m plots. Using our sampling nets we found an average of 4 aquatic invertebrates per 1 meter plot. The aquatic invertebrates found inside the pond included stoneflies, mayflies, and riffle beetles. We sampled the stream leading into the pond to see if there were differences in the number and types of organisms. In the stream we found an average of 3 aquatic organisms (mainly crawdads) per 1 meter plot. Therefore our hypothesis was confirmed in that the beaver ponds serve as habitats for unique assemblages of organisms.

ABSTRACT 18

The Synthesis & Analysis of Metallic & Semiconducting Nanoparticles

Elizabeth M. Henry

Faculty Sponsor/Mentor: Dr. Deon T. Miles, Chemistry

Monolayer-protected gold nanoparticles were prepared using several different synthetic methods. The prepared nanoparticles were characterized by UV-visible spectroscopy, cyclic voltammetry (CV), differential pulse voltammetry (DPV), and mass spectrometry. Different thiols were used in the synthetic scheme in order to monitor differences in surface chemistry. A study of quantum yield in water-soluble, monolayer-protected quantum dots (QDs) was completed. The study examined the changes in quantum yield from the effects of heating, method of selenide addition, type of surrounding thiol, and material lifetime. Subsequent modifications of the QD surface were characterized using electrochemistry.

ABSTRACT 19

Eastern Box Turtle Habitat Fragmentation & Barriers on the Domain

Jeff Kirchberg & Carolyn Ramseur

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

The goal of this project was to create a map of potential box turtle habitat in the central campus of University of the South based on barriers to movement and habitat patch size. We examined the size of a road and volume of traffic of selected roads in the field and used this information to categorize all roads with the study area. We chose five different sizes of fragments to visit and qualitatively assessed habitat viability. A viable habitat/fragmentation was defined as a place that was 1.2ha or larger that had variation of food sources, the possibility to move from habitat to habitat, and a source of shallow water. On our map of central campus, there are a total of 67 fragments with a total of 1387 ha of possible habitat with a mean being 21 ha; within these fragments is a total area of 212 ha of grass, which we considered as non-viable habitat in our data. The largest fragment found on our map is 531 ha, and the smallest is .01ha. Through our research we found that generally in Sewanee, the further from central campus a fragment is located, the more viable it tends to be. Our results suggest that central campus may serve as a potential habitat for box turtles. However the viability of this habitat is dependent land use, land cover and road traffic. We hope that the people of Sewanee will use this information to successfully coexist with box turtles on central campus.

ABSTRACT 20

Investigating Illusory Language

Augustine Hosch

Phil 306 – Epistemology (Dr. James Peterman)

Philosopher Ludwig Wittgenstein, in his work *On Certainty*, attributes the meaning of a word to its role within a “language-game,” or a society’s use of a word and how it operates within that society’s cultural context. The question of course arises: What determines a word’s “use”? Various philosophers have offered correspondingly various methods of determining a word’s “use,” such as observing the operation of a word in its “everyday” context, verifying objectively the operation of a word, or actively investigating how the word operates within a context. After researching some of the different methods of determining “use” proffered by Cora Diamond and Norman Malcolm, I have analyzed Wittgenstein’s claim that meaning within a “private” language-game (where the context around the word’s meaning is unique to a single person) is nonexistent, and I have investigated whether or not “language” within a dream or illusion might have actual meaning. Wittgenstein would claim that such a “language” could not, since such “languages” have no relation to actual people, but I would state that we generally tend to think that concepts within our dreams are at least coherent – if seemingly nonsensical. Defining an illusory language-game as one in which the mind thinks it is participating in an actual language-game and using the capability of “translation” as outlined by philosopher Hans-Johann Glock, can the illusory language-game provide actual meaning? I will argue that language from an illusory language-game can have actual meaning.

ABSTRACT 21

The Ability to Predict Suitable Sandstone Outcrop Environment for *Diamorpha smallii* on the Cumberland Plateau through GIS Technology

Jennifer Caldwell & Stewart Calder

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) &

EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

In our study, we examined the ability of GIS to detect suitable sandstone outcrop habitat for *Diamorpha smallii*, an endangered plant species found on the Cumberland Plateau. We also examined the relationship of human disturbances, specifically roads or buildings, on the presence of the plant and whether these disturbances hinder the ability of *D. smallii* to grow on associated sandstone outcrops. We hypothesized that *D. smallii* will be more abundant on sandstone outcrops that are further away from human development. Through GIS, we identified over 50 sandstone outcrops and visited 11 of those sites. At each site we visited, we discovered a sandstone outcrop yet only 4 of those sites contained *D. smallii*. None of the visited sites that were in close proximity to roads or buildings had *D. smallii* present. GIS can be used to locate potential habitat *D. smallii* on the Plateau as a function of both remotely sensed sandstone outcrops and proximity to human disturbance.

ABSTRACT 22

Sub-solidus hydrothermal alteration of primary minerals in the Elberton & Stone Mountain granites of Georgia: Waves and Cat’s Paws

Charles Peel & Stephen A. Shaver, *Forestry & Geology*

The Elberton granite (Elberton County, northeastern Georgia), is a fine-grained granite (1-2mm grain size) composed of 4-7% biotite, 30% quartz, 30-35% Na-rich plagioclase (An₁₅₋₂₇), 30-35% K-feldspar (mostly microcline), ~ 1% allanite, and lesser apatite, magnetite, sphene, and zircon. Crystallized at depths of ~13km, its fine grain size was interpreted by Whitney and others (1980) as having resulted from rapid pressure drop due to loss of exsolved H₂O at this depth. The Stone Mt. granite, which crops out near Stone Mountain, GA (90 miles east of Elberton) is a medium-grained (2-5mm), muscovite-rich, two-mica granite composed of 1-2% biotite, 6-12% muscovite, and subequal amounts of quartz (29-33%), Na-rich plagioclase (An₁₀₋₁₈) (30-35%), and K-feldspar (20-27%, largely microcline). Both granites are of similar ages based on U-Pb zircon dating (325 Ma for Stone Mt., 320 ± 20 Ma for Elberton) and both formed from subduction-related magmas of the Alleghenian orogeny during the formation of the Pangaea supercontinent.

Both granites produced their respective mineralogies during cooling to approximately 600°C, but each shows unusual sub-solidus features related to hydrothermal fluids or vapors emanated by the still-cooling granites after solidification. The Elberton granite contains thin (1-4cm), white, sub-horizontal sheet-like structures called **waves** that cut across the granite, while the Stone Mountain granite contains

ovoid black-and-white patches called cat's paws (3-6 cm diameter) consisting of a "black" center (2-5 cm across) rich in tourmaline + quartz, and a "white" rim (0.5-1 cm across) rich in plagioclase, K-spar, and quartz. The purpose of this study is to use microscopic point counting techniques to quantify the mineralogy of the waves and **cat's paws**, and to use this quantitative mineralogy to infer the stoichiometry of the responsible hydrothermal chemical reactions.

Results of point counts of the Elberton samples show that, compared to the host granite, **waves** (42-47% plag, 40-41% Kspar, 6-12% qtz, 3-4% biotite) are enriched in plag and Kspar, but depleted in quartz, biotite, and allanite. Textural features visible petrographically (i.e., using a petrographic microscope) indicate that the depleted minerals were replaced hydrothermally by plag and Kspar, and chemical stoichiometry suggests the replacement reaction involved qtz-bio-allanite replacement by fluids or vapors rich in Na⁺ and K⁺. Point counts of the Stone Mt. cat's paws show that paw centers contain 13-17% tourmaline, 26-38% plag, 19-23% Kspar, 30-37% quartz, 0-1% muscovite, and trace biotite (more tourm and qtz, less plag and Kspar, and much less muscovite and biotite than the host granite), while **cat's paw rims** are strongly enriched in plag (39-48%) and Kspar (22-27%), but depleted in quartz (20-32%), muscovite (3-6%), and biotite (trace) compared to the host. These data, and mineral replacements visible petrographically, suggest (1) that cat's paw centers formed when high-temperature B₂O₃ vapors replaced muscovite, biotite, and plag to form tourmaline + qtz (+ excess K⁺, Na⁺, and Al⁺³) and (2) that the excess K⁺, Na⁺, and Al⁺³ was transferred outward to the paw rims to replace quartz, biotite, and muscovite with plag and Kspar.

ABSTRACT 23

Dispersal of Light Pollution around Tennessee Avenue, Sewanee, TN

Carson Pfeifer & Sarah Delong

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

The goal of this project was to create a light pollution map for the Tennessee Avenue area of Sewanee. We hypothesized that the distribution of artificial light would be heterogeneous along this road. By using a light meter we calculated the average radius of light dispersal from houses, academic buildings, street lamps, walkway lamps, parking lot lights and field lights. From these averages we created a buffer or zone of illumination around each of the light sources, which were located on the map with a GPS. An additional approach we used was to calculate the average light intensity at each type of light source. From this data, we created a kernel density map, which shows the intensity of the light within the zones of illumination. As a result of these methods and calculations, we have concluded that the dispersal of light is heterogeneous. Light, as distributed in the way we have described, may impact the behavior of nocturnal organisms using or dispersing through this area. This light map could aid as a basis for future studies of the effects of light pollution in Sewanee, Tennessee.

ABSTRACT 24

Preliminary Properties of a New Measure of Assertiveness, Strategic Assertiveness and Passivity

Hadley Mates, Leigh Anne Pickett, Catherine Bryson, Jeannette Robb & C. Albert Bardi
Psyc 363 (Dr. C. Albert Bardi)

Extant measures (e.g. Rathus, 1973) conceptualize assertiveness as social boldness and frankness. Studies assessing minority groups in the U.S. (e.g., Hall & Beil-Warner, 1978) with a variety of measures of assertiveness have yielded group differences that may be best accounted for by the historic application of measures developed on European-Americans to other cultural groups. A recent qualitative study (Chandrasekaran, Clark, Croasdaile, Mates, McNair, Pickett & Bardi, 2010) found that in addition to traditionally-defined assertiveness, Latinos endorse themes of *strategic assertiveness* as a mode of dealing with interpersonal conflict. The current study seeks to create a valid and reliable measure of three separate behavioral categories: assertiveness, strategic assertiveness and passivity. A sixty item pool was created using qualitative study themes and theoretically-derived alteration of existing scale (e.g. Rathus, 1973) items. In order to gauge potential problems with item content, two focus groups of students of minority identity were held. Post focus group revision of the item pool yielded 50 items. The 50 item pool was administered with a scale of social desirability to several psychology classes. Results of statistical analyses including item distributions, reliability of proposed scales and social desirability responding are presented.

ABSTRACT 25

Sedimentary origins of an 8000 year-old rock shelter through Particle Size Analysis & X-ray Diffraction of clays

Leila Donn

Faculty Sponsor(s)/Mentor(s): Dr. Ken Smith & Dr. Stephen Shaver, Forestry & Geology

This geoarchaeological study was designed to determine the sedimentary and anthropogenic origin of an 8000 year-old Warren Point Sandstone rockshelter on the Domain of the University of the South following a 2.5 month excavation during the summer of 2009. Analyzed sediments were collected at 10cm increments from an excavated trench 70 cm in depth (7 samples). We detected a high clay percentage (20-40%) throughout the trench using Particle Size Analysis (PSA). The samples at each depth were then x-ray diffracted at 1 hour each to conduct a mineralogical analysis of the clay fraction. We detected kaolinite, montmorillonite and illite as well as additional secondary minerals. Preliminary results from repeat x-ray diffraction of samples at 22 hours each shows a much more quantifiable clay type distribution. At present, it seems likely that the clays may have an anthropogenic origin. Additional research is needed to quantify the influence of clays from the rock surrounding the shelter.

ABSTRACT 26

Potential Mountain Lion Habitat on the Domain & Barriers to its Access

Mary Mazyck, Catherine Bartenstein, Charlie Williams, & Elizabeth Wilson

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

Although mountain lions were declared extinct in the eastern United States in 2011, there is continued interest in the possibility of small surviving populations in remote areas. In the last several years, there have been many unconfirmed sightings on the Cumberland Plateau, including the Domain of The University of the South. We hypothesize that the Domain facilitates mountain lion movement through the greater undeveloped lands of the southern Cumberland Plateau. To analyze this, we categorized roads as barriers to movement based on pavement type, width, and traffic density for mountain lion crossing. We also classified the suitability of land of the Domain for the movement of mountain lions based on its forest cover type, land use history, as well as housing density. We combined all of these data into a geographic information system (GIS) to output the most likely corridors for mountain lions to enter the domain as well as significant barriers to their movement. With this analysis, we found that there are two likely corridors in which a mountain lion could successfully pass between the suitable habitat south of the Domain into areas of suitable habitat west of the Domain.

ABSTRACT 27

Predicting Multiflora Rose Habitat on the Sewanee Domain

Charlotte Henderson & Will Cowan

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

We examined the dispersal of multiflora rose (*Rosa multiflora*), an invasive species on the Sewanee Domain. We hypothesized that multiflora rose is found in areas in close proximity to human disturbances in wet, low lying areas. After examining a test location, we used GIS mapping to predict multiflora rose habitat and then continued to test small sections of these areas. We saw that our hypothesis was supported. Multiflora rose prefers edge habitats. Multiflora rose was able to invade into natural disturbances but with much less frequency than human disturbed areas. Our results indicate that any future efforts to control multiflora rose should focus on areas near human disturbance such as powerline cuts, roads and dumps.

ABSTRACT 28

The impact of growth factors on the expression of nitric oxide synthase in pulmonary fibroblasts

Hali Gipson, Blake Caldwell, & Scott Ward

Faculty Mentor: Dr. Bethel Sharma, Chemistry

Pulmonary fibrosis is a devastating illness belonging to a class of disorders known as Interstitial Lung Diseases, all of which lead to progressive scarring of the lungs. Nitric oxide (NO) is one of the factors implicated in the advancement of the disease at the molecular level. Currently, we are investigating changes in fibroblast protein expression that indicate conversion to an “activated” myofibroblast. Immunocytochemistry can confirm the presence of the myofibroblast phenotype. Using immunoblotting, we want to identify which of the three known isoform(s) of nitric oxide synthase (NOS) are responsible for producing NO in the myofibroblasts. Initial results indicate that inducible NOS may be the dominant isoform in human lung fibroblasts.

ABSTRACT 29

Pharmaceuticals from wastewater in streams draining a forested watershed on the Cumberland Plateau

Erica Teasley, Julie Bennett, & Callie Crider

Faculty Mentors: Dr. Deborah McGrath, Biology, & Dr. Ken Smith, Forestry & Geology

Research has increasingly focused on the excretion of pharmaceuticals into the environment through wastewater effluent. Wastewater treatment at the Sewanee Utility District involves biodegradation of sewage passing through open lagoons. In lieu of discharging the treated wastewater directly into streams, the effluent is discharged onto 65 acres of hardwood forest. Using Polar Organic Chemical Integrative Samplers, we sampled water from rain-fed lakes, raw sewage, treated effluent and streams draining the watershed to determine if the treatment process removes pharmaceuticals. The samplers were analyzed using HPLC triple quadrupole MS/MS. Twice as many pharmaceuticals were found in the raw sewage from Fall 2010 compared to Summer 2010. No pharmaceuticals were present the drinking water lakes nor in two of the streams draining the watershed. Methamphetamine and ephedrine were present in one stream. Further study is necessary to determine whether tertiary treatment through forest application reduces the presence of pharmaceuticals in stream water.

ABSTRACT 30

Streams as Dispersal Corridors for Privet on the Domain

Marshall Williams and Meagen McMillan

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

Privet (*Ligustrum sinense*) is an exotic and invasive species on the Domain that has most likely been introduced by humans through gardening. The purpose of this project was to measure the density and spread of privet along the streams in relatively undisturbed cove habitat and to identify the possible sources of the privet on top of the plateau. We chose Shakerag Hollow for our place of study due to its undisturbed cove habitat, multiple streams with varied depths, and the numerous land use types in the upper watershed. The streams vary from 587 to 345 meters long and an estimated depth of 3 to 18 cm. It is our hypothesis that privet has been spread into Shakerag Hollow's pristine cove habitat and was introduced by residential land use upstream. To test this, we hiked along the streams, recording the locations of privet using GPS. After combining this field data with elevation and land use data from ArcGIS, the evidence showed that privet seems to prefer streams that are continuously flowing and with a depth of at least 8 cm. On average there are 7 privet plants per stream. The streams that do not come into contact with University Avenue have an average of 2 stems per stream whereas the streams in contact have an average of 10 stems per stream. Therefore, the seeds of this species are most likely originating from the roadway through tire treads. Privet has yet to spread into the main tributary in Shakerag Hollow.

ABSTRACT 31

Reactions to the Campus Climate Survey: Policy Considerations for Multicultural Students at Sewanee

Shameka Jennings, Emily Nicholson, Miriam Pate & C. Albert Bardi
Faculty Sponsor/Mentor: Dr. C. Albert Bardi

This study sought to explore and assess multicultural students' academic, social and personal experiences at the University of the South. The researchers conducted individual interviews with a standardized set of questions. Participants were briefed with the results of a recent campus climate survey and interviewed about related issues such as witnessing and/or experiencing racial discrimination or harassment, academic expectations, social expectations, overall content level with their college experience, and what changes they would like to see implemented. Participants in the study were multicultural students ranging from freshmen to seniors at the University of the South. Tentative yet recurring themes included the conflict between a highly positive academic experience and an unsatisfactory social life, issues of academic and social opportunities and support for diverse students on campus compared to the mainstream and dominant culture, experiences of insensitivity in and outside of the classroom, lack of diversity in faculty and staff, and concerns regarding retention of multicultural students over four years of education. Using the thematic data collected, suggestion for policy changes and implementation are offered.

ABSTRACT 32

Identification of Potential *Anguispira picta* Presence on the Sewanee Domain

Keri Bryan & Michelle Ghandhi

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

Anguispira picta (painted snake coiled forest snail) is a threatened land snail (as listed by the U.S. Fish and Wildlife Service in 1978) whose known range is restricted to 325 acres in Buck Creek Cove near Sherwood, TN. Since it was first reported as a threatened species, no additional populations of *A. picta* other than the Buck Creek Cove population have been found, making the species at risk of extinction, should very local extirpation in Buck Creek Cove occur. The purpose of this study is to locate areas of suitable habitat for *A. picta* on the domain of the University of the South. Using ArcGIS software, limestone outcrops fitting elevation (750 to 930 feet in elevation), distance from nearest stream (with relatively close proximity to a stream), and bedrock type requirements (presence of limestone) of *A. picta* were located on the domain. These areas were located in the field using GPS and *A. picta* was systematically searched. A total snail count and a count of snails of the genus *Anguispira* were recorded. Although areas meeting the habitat criteria were found containing many land snails, including those of the genus *Anguispira*, we did not find *A. picta* on these outcrops. This study successfully used GIS to identify areas of possible habitat for this rare snail.

ABSTRACT 33

Biomass & Carbon Storage Estimates for the University Domain

Sarah Long & Karen Kuers

Faculty Sponsor/Mentor: Dr. Karen Kuers, Forestry & Geology

Tree biomass estimates are useful for determining the possible use of wood as an alternative energy source, and for calculating the amount of atmospheric carbon stored in wood. The two main objectives of this study were: 1) to estimate biomass and carbon storage in the aboveground portion of trees in the forests of the University Domain, and 2) to partition these values by diameter class, species group, and landscape position. The study primarily used data collected from the Forest Inventory conducted from 1997 to 2002 by interns working in the University's Office of Domain Management, which measured trees ≥ 2 inches in diameter in forest compartments both on top of the plateau and below the bluff. A third objective of the study was to identify Domain areas that lack inventory data as well as those that have been modified by natural or human disturbance since they were surveyed.

The diameter at breast height (DBH) of the individual trees within the stands was used to calculate the total above ground woody biomass on a per tree basis. This study used two separate logarithmic allometric formulas to calculate the above ground biomass of individual trees; Jenkins et al. (2004) and Kelly and Ramseur (1981) to get an estimate of the range of possible values. The Jenkins equations are national estimators for biomass that separated the individual stems into species groups and provided a different formula per group, while the formula from Kelly and Ramseur was a single equation, developed from trees

sampled near Sewanee, in Franklin State Forest. Carbon values were estimated using 2003 data from the Split Creek Watershed on the Domain which found that the percent of carbon in the woody biomass was 46.5 % for hardwood species and 50% for pine species. The total acres included in the estimate were 6734 (4172 acres above the bluff and 2562 acres below the bluff), representing just over half of the Domain. The remaining acres are areas that lack any inventory, have been modified since inventory, or are in urban areas that have only limited data. Plans for inventorying the remaining areas are still in development with the end goal being to have biomass and carbon estimates for the whole Domain.

ABSTRACT 34

Suitability of Virginia Pine as an Indicator of Shallow Soils on the Sewanee Domain & the Effectiveness of GIS in Locating Pine Stands

Sara Hildebrand & Maggie Shipley

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

Virginia pine (*Pinus virginiana*) has been found to be tolerant of nutrient-poor and drought prone soil conditions and, therefore, is able to survive in shallow soil as well as in areas of disturbance. On Sewanee's Domain, we believe that Virginia pine could be an indicator species for shallow soils, a habitat upon which many other organisms are dependent. Using GIS, including aerial and infrared photographs, we identified Virginia pine stands on the domain, eliminated those stands that are located on known areas of anthropogenic land use, and compiled a map of twenty possible shallow soil stands. We then visited several of these stands and measured soil depth. We compared soil depth within the Virginia pine stands to soil depth measurements taken in stands with other trees in order to determine if Virginia pines existed in shallower soil. We found that GIS has limited capabilities to accurately identify Virginia Pine stands. Additionally, the soil depth in stands that contain Virginia pine was shallower than in those stands that contained other species of trees. Determining an indicator species for shallow soil that is identifiable by GIS is important for the future ability to find this specific acidic and dry habitat that harbors a unique community of organisms.

ABSTRACT 35

Investigating Maternal Distress Tolerance: The Simulated Baby Paradigm

Emily Simpson, Linda Mayes, M.D., Helena Rutherford, Ph.D.

Yale Child Study Center

Much literature has devoted itself to examining the infant's developmental relationship to the mother. Everyone from Bowlby to Ainsworth has speculated on the matter, yet little research has examined the developmental relationship of the mother to the infant. Mothers undergo a complex neurobiological transition into parenthood, where there is a shifting of focus to the new baby. To any mother, a crying baby is distressing, and repeated efforts to soothe an infant increase the stress response experienced by the mother. Therefore an important component of parenting is being able to successfully regulate stress reactivity and distress in the parenting situation. Using a simulated baby, this experiment seeks to explore the nature of maternal response to infant distress. Some basic questions of the study concern the similarity or uniqueness of maternal distress tolerance to the simulator versus other non-maternal distress tolerance tasks, as well as individual differences in emotion regulation, reward sensitivity, and maternal anxiety and depression. Thirty-five mothers completed extensive parenting questionnaires, a computer activity designed to measure non-maternal distress tolerance, one measuring reward sensitivity, and an interaction where they were instructed to soothe the crying simulator. Initial results indicate that the persistence times on the non-maternal distress tolerance task do not correlate with the persistence times with the maternal distress tolerance task (the simulator interaction). These early findings suggest that a mother's response to infant distress is unique among activities demanding distress tolerance, reflecting the necessity of research involving this crying simulator paradigm.

ABSTRACT 36

Role of Wind Direction in Determining White Pine Invasion Along Firelanes

Meg Armistead, Theresa Monypeny, & James McGee

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

White pine (*Pinus strobus*) is a non-native species that was planted and has spread, preventing the regeneration of the native hardwood trees along firelanes on the Domain. We hypothesized that prevailing wind direction during white pine seed dispersal determines the relative abundance of seedling establishment along firelanes. We predicted that along north-south running firelanes, there would be a greater abundance of white pine on the eastern side of the road due to the prevailing westerly wind direction during white pine seed dispersal. This wind data combined with dispersal range was compiled into the GIS database and overlain onto aerial photographs of two north-south roads off Breakfield Rd. In the field, we measured and compared white pine density on the eastern versus western sides of the roads. Our hypothesis was supported by data collected on Rd 1. However, Road 2 failed to support our hypothesis. With more data collection, wind patterns could be used to locate existing white pine populations and predict potential populations throughout the domain. This information would be useful for conservation biologists managing for white pine invasion into the native hardwood forests.

ABSTRACT 37

Electrochemical Characterization of Liquid Crystalline Platinum(II) Bipyridine Complexes

Breland Brumby

Faculty Sponsor/Mentor: Dr. Robert E. Bachman, Chemistry

Liquid crystalline materials composed of a platinum center chelated by a bipyridine ring and additional ligands have been of immense interest in recent years for their interesting photochemical and electrochemical behavior. The selection of ligands has the ability to selectively tune the behavior of the molecule. In this study, platinum bipyridine systems with ester chains in either the 4-4 or the 5-5' positions on the bipyridine and dithiolate or phenyl acetylide ligands were examined with cyclic voltammetry and chronocoulometry. In solution, the dithiolate series exhibited oxidation-reduction behavior independent of the ester chain length, and the presence of two reversible reductions and one irreversible oxidation was consistent with prior studies. The reversible waves have been assigned as π to π^* transitions on the bipyridine ring and a mixed metal ligand to ligand transition (MMLLCT). Phenyl acetylides were studied in solution and as thin films on ITO-covered glass working electrodes. In solution, the phenyl acetylides had a similar bipyridine π to π^* transition in addition to MMLLCT. Position of the ester chain influences redox behavior by possibly facilitating oxidation, as the 5-5' system is completely reversible, whereas the 4-4' system is not. The 5-5' phenyl acetylide film on ITO exhibited some color changes unseen in similar films and is currently being studied with chronocoulometry.

ABSTRACT 38

Yellow Boy Drainage in Sewanee, TN

Senemeh Buist-Baker, Thao Bui, & Meghan Stuart

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

Yellow boy occurs naturally in Sewanee, TN in association with the dams of Lake Cheston, Lake Dimmick, and Lake O'Donnell. Yellow boy forms from iron and manganese oxide precipitating out of stream water leaking from the bottom of the dam. Usually yellow boy appears as a yellowish-orange to brown pigment within the drainage streams. This ferric hydroxide precipitate can act as a blanket of pollution that is potentially harmful to aquatic flora and fauna; therefore, it has capability of destructing natural ecological processes. We hypothesized that the amount of yellow boy precipitate would be greater in the streams draining from larger lakes. The location of yellow boy is measured in the field using a handheld GPS. The distances of yellow boy deposits from the dam outlets and along streams were mapped in GIS. Our hypothesis was not supported. We found that the distance of the yellow boy drainage was inversely related to the size of the lakes. The lake with the smallest area, Lake Cheston, had the greatest amount of yellow boy. While the lake with the largest area, Lake Dimmick had the lowest amount of the yellow boy. Using these results we speculated that other factors (i.e. vegetation, bedrock types, or soil depth) besides lake size affects yellow boy drainage on the Sewanee Domain.

ABSTRACT 39

Professors' perceptions of students' academic success based on students' race & clothing formality

Marci Weber & CJ Phillips-Pitts

Psyc 251 – Research Methods (Dr. Al Bardi)

This study examined the potential GPA that 41 college professors predicted for students based on a photograph of either a White male in formal clothing, the same White male in casual clothing, a Black male in formal clothing, or the same Black male in casual clothing. The formality of clothing had no significant effect on the Potential GPA, or expected academic success, that the participants recorded. Although mostly of White racial background, the professors tended to expect higher academic success from the Black student, regardless of the clothing he was pictured in. Because of the obtrusiveness of this measure, it is possible that this reverse race effect is due to overcompensation for the Black students based on the professors' awareness of their own possible prejudices. The implications of this reverse effect may be that, in actual grading, professors are not as likely to grant higher grades to Black students as they were in a study that clearly involved racial topics. Alternative explanations, such as the possibility that different race-based factors may have such negative impacts on academic success that they overwhelm any overcompensation by professors, are also discussed.

ABSTRACT 40

Tree-ring Based Drought Reconstruction for Tennessee's Southern Cumberland Plateau

Patrick Vestal

Faculty Sponsor/Mentor: Dr. Scott Torreano, Forestry and Geology

The drought of 2007 was one of the worst droughts on record for Tennessee and much of the Southeastern U.S. Weather data prior to 1900 is scarce for the southern Cumberland Plateau, and thus one must rely on climate reconstructions to recreate drought in years before the advent of weather instrumentation. We hypothesize that the occurrence and magnitude of the 2007 drought is normal when compared to this area's drought record. We sought to create a 300 to 400-year-old drought record for the southern Cumberland Plateau using tree-rings as a proxy. A white oak (*Quercus alba*) chronology was made using cored trees from Savage Gulf State Natural Area (SGSNA) in Tracy City, Tennessee. The cores were aged and measured using standard dendrochronological procedures. Using the program ARSTAN, climatic data was gathered from tree rings by minimizing noise (i.e. local site conditions). Our results show that the Cumberland Plateau has experienced droughts more severe in magnitude than the 2007, and that drought occurrence for the Cumberland Plateau has been low compared to the historical average. Droughts often occurred in episodes spanning two or more years within a given decade, such as those experienced in the first half of the 20th century. These drought episodes may be influenced by natural phenomena, such as the North Atlantic Oscillation (NAO), which affects rainfall.

ABSTRACT 41

Mia Hamm or Michael Jordan?

The Gender of Sports Magazine Covers Over the Past 60 Years

Shelby A. Bartlett

Psyc 251 – Research Methods (Dr. Warren D. Craft)

Since the introduction of Title IX in 1972, America has experienced a steady increase in female athletic participation. Thomas (2008) reports that before Title IX, approximately 300,000 (1 in 27) girls participated in sports. Now, women participate in sports as much as men: for example, almost 3 million (1 in 3) girls participate in high school sports. This study aims to see if *Sports Illustrated* has adjusted the gender of their covers to match the rise of American females competing in sports. We examined the gender categories of *Sports Illustrated* in the years 1957, 1967, 1977, 1987, 1997, and 2007, initially hypothesizing that *Sports Illustrated* would follow the trend of increasing female athletic participation and put more women on the magazine's covers. However, *Sports Illustrated* did not increase the number of females featured on their covers, despite the dramatic increase in the number of women participating in high school and college sports. Although the number of male-dominated covers has continued to increase over the past several decades, the number of female covers has remained virtually the same.

ABSTRACT 42

Effect of Logging Practices on White Pine Invasion

John Haskell & Charles Peel

Combined Class Project: Biol 222 – Advanced Conservation Biology (Dr. John Evans) & EnSt 217 – Fundamentals of GIS (Dr. Chris Van de Ven)

In this study we examined the density of white pine (*Pinus strobus*) in sites off of Breakfield road that had been logged since 1970. White pine is not native to the Domain but was planted extensively in the 1950s and 60s in plantations and along firelanes. Offspring from these plantings began to invade the upland forest in 1970s. We hypothesized that logging facilitates the establishment of white pine on the Domain and that clearcut areas would show a greater effect than areas that were selectively harvested. We quantitatively analyzed sites for pine abundance off of Breakfield Rd. Using ArcMap's spatial analysis features we established a map denoting observed differences between plots. Preliminary data suggest that there is a higher abundance of white pine in sites that had been clear-cut as opposed to selectively cut and an overall lower density in sites that had not been logged since 1970. Our goal was to understand the link between logging and subsequent white pine appearance.

ABSTRACT 43

The Effect of Perceived Social Norms on Generosity

Matt Hagler, Cathy Lambert, & Natalie Rothwell

Faculty Sponsor/Mentor: Dr. Karen Yu, Psychology

Generosity, defined as one's willingness to give, has been studied in a variety of contexts. The present study sought to uncover the effect that mindset could have on generosity. Specifically, we manipulated mindset by presenting social norms of generosity. Undergraduate students of a small liberal arts college were asked to complete an online questionnaire supposedly measuring student participation in outreach programs. Embedded within the questionnaire were statistics that established different social norms for generosity. There were three conditions: one in which the statistics were high, one in which the statistics were low, and a neutral condition in which no statistics were given; students were randomly assigned to one of these conditions. Following these manipulation questions were two evaluative questions that measured generosity through the participants' allocation of funds to outreach and charity. These evaluative questions were followed by an abbreviated version of the Interpersonal Generosity Scale (IGS). Data collection is complete, but analysis and conclusions are still pending.

ABSTRACT 44

Toward Supramolecular Liquid-Crystalline Materials: Synthesis & Characterization of Platinum(II) Acetylide Complexes

Anne E. Taliaferro

Faculty Sponsor/Mentor: Dr. Robert E. Bachman, Chemistry

Bipyridine complexes of platinum (II) complexes have long been recognized to possess a host of interesting, and potentially useful, structural, optical and electronic properties. By elaborating the structure of the bipyridine moiety of [bpyPt(II)Cl₂] with a pair of b-branched Guerbet ester fragments, liquid-crystalline derivatives of this unique chromophore have been prepared. In several cases, the liquid-crystalline behavior was observed to persist well below room temperature. Efforts to utilize acetylide linkages to couple either multiple liquid-crystalline bipyridine platinum fragments or a mixture of these bipyridine fragments and alkylated carbazole moieties are currently underway. As part of these efforts, a series of diarylacetylide model complexes has been prepared via substitution of the chloride ligands. The optical, electronic and phase behavior of this new series of materials, as well as progress toward the creation of the targeted supramolecular arrays, will be presented.

ABSTRACT 45

Effect of exurban development on land snail diversity & abundance in Sewanee, Tennessee

Keri Bryan, Maggie Shipley, & David Haskell, *Biology*

Exurban development in Sewanee, Tennessee has been linked to increased bird diversity and abundance. Birds may produce fewer defective shells in exurban areas than in forested areas because birds consume anthropogenic sources of calcium. Another explanation may be that snails, a preferable source of calcium for birds, are more abundant in developed areas. The purpose of this study is to determine the effect of exurban development on snail abundance and diversity in Sewanee, Tennessee. We tested the hypothesis that land snail abundance and species richness would differ between undeveloped forest and exurban areas on the uplands of the Cumberland Plateau. We also tested the hypothesis that snail community composition in the exurban habitat would resemble that of both the plateau top forest and the sandstone cove forest. Timed snail searches were conducted in exurban areas, plateau forests, and upper cove forests in Sewanee, TN, and snails were identified to species and counted in the lab. We found similar snail abundances in the sandstone cove habitat and the exurban habitat, with a much lower abundance in the undeveloped plateau forest. We also found exurban species richness to be in between that of the plateau forest and the sandstone cove forest. Thus, snail diversity differs among these three habitats, and exurban habitats may increase snail diversity on top of the plateau. Possible mechanisms for the increased abundance of land snails in exurban areas include changed moisture conditions and increased calcium availability due to imported limestone for house- and road-building.

ABSTRACT 46

Author Gender in Literary, Financial, & Entertainment Magazines

Lillian Oliver McLemore

Psyc 251 - Research Methods (Dr. Warren D. Craft)

Since the early 20th century, women have been making their way into the professional workplace. To investigate the extent to which women have achieved parity in the field of print journalism, I recorded the gender of each author noted in a diverse sample of magazines in literary, financial/news, and entertainment categories (the sample included, for example, publications such as *The New Yorker*, *People*, and *The Wallstreet Journal*.) Of the 776 author name occurrences, roughly 43% were female, 57% male. That moderate imbalance, however, glosses over a more extreme disparity: Of the 215 author name occurrences in entertainment magazines, 39% were male and 61% were female. Of the 561 author name occurrences in Literary/News/Financial magazines, 68% were male and 32% were female. Although the overall gender prevalence difference is not exceedingly large, there is a significant and persistent imbalance between the subcategories.

ABSTRACT 47

Interaction of protons and alpha particles with Li-7 and F-19 atoms

D.A. Roberson, P. Kharel, S. Veselovsky, R.S. Peterson (The University of the South), and J.L. Duggan (UNT)

We measured protons that were elastically scattered off nucleus and high energy alpha particles that were the product of inelastic interactions of protons with nucleus. We used incident proton beam of 1.5 MeV energy to bombard LiF target on C substrate. The theory for both elastic and inelastic scattering is straight forward and non-relativistic. Despite its simplicity, we get a good agreement between the measured and theoretical energies of the scattered particles. This is an example of an easy to replicate experiment, which can be performed in a relatively short amount of time.

ORAL PRESENTATIONS

SESSION 1A – Spencer 271

- 2:00 PM **Choreographed Art and Architecture during the Reign of King Louis XIV**
Jenalee N. Tirpak, *Art History*
- 2:20 **The Evolution of the 18th and 19th c. Childhood Through Images**
Faith Grabarz, *History*
- 2:40 **Testa dell' Effebo**
Jenny Liles et al, *Classics*
- 3:00 **"The Hat Trick: Joyce's Use of the Hat in *Ulysses*"**
Elisa Faison, *English*

BREAK

SESSION 1B – Spencer 271

- 3:30 **"Being constrain'd with dreadful circumstance":
The Violence of Identity in Shakespeare's *The Rape of Lucrece***
Amy Nelson, *English*
- 3:50 **"Churches that Look Like Churches":
Traditionalism in Recent Catholic Church Architecture**
Emily Nielsen, *Art History*
- 4:10 **Skepticism as Solution, a Reevaluation of Philosophical Skepticism
as a response to Present Issues in Epistemology**
Aaron Rutz, *Philosophy*
- 4:30 **Flaubert's Language: Limits and Transcendence**
Emily Nielsen, *French & French Studies*

SESSION 2 – Spencer 151

- 2:00 PM **Does An Apple A Day Keep the Autism Away? A review of nutritional
remedies to autism spectrum disorders**
Chris Hague, *Psychology*
- 2:20 **Crossing Lines of Social Time: Adolescent Behavior and America's Response**
DeAndré A. Espree-Conaway, *Anthropology*
- 2:50 **The relationship between home range and foraging behavior
of semi-free ranging Lemur catta on St. Catherine's Island, Ga.**
Michelle Ghandi, *Psychology*

SESSION 3 – Spencer 164

- 2:00 PM **Phylogeography of the troglolithic millipede
genus *Tetracion* (Callipodida: Abacionidae)**
Stephanie Loria, *Biology*
- 2:20 **Synthesis of CdSe Quantum Dots using Various Metal Salts**
Adrienne Bordchart, *Chemistry*
- 2:50 **Phylogeography of the land snail genus *Anguispira* (Gastropoda: Discidae)**
Jia Pan, *Biology*

ABSTRACT A

Crossing Lines of Social Time: Adolescent Behavior and America's Response

DeAndré A. Espree-Conaway

Anth 301 – American Culture (Dr. R. A. O'Connor)

Time: 2:20 PM | **Location:** Spencer 151

This study endeavors to provide a look at the stages of the American life cycle, focusing especially on the stage of adolescence and the presumed notion that biology motivates the behavior attributed to this category. The study continues by discussing how society attributes meaning to the life cycle as a temporality that it sharply divides with lines or rites established not by ceremonial *rites de passage*, but by behavior, that inherently proves one's move from one's stage to the next. The study obtained its data through four in-depth interviews in order to discover some possible ways that people think about adolescence and why they think the way, they do.

ABSTRACT B

“Churches that Look Like Churches”:

Traditionalism in Recent Catholic Church Architecture

Emily Nielsen, C'11

Faculty Sponsor/Mentor: Dr. Jeanne-Marie Musto, Art & Art History

Time: 3:50 PM | **Location:** Spencer 271

This paper examines the traditionalist movement in Catholic church architecture in the U.S. over the past two decades. Taking into account the reasons for discontent with churches built in the Modernist style, this paper considers both the theological claims of traditionalist architects and their architectural expression. It focuses on four representative churches: St. Thomas Aquinas College's neo-Baroque Our Lady of the Most Holy Trinity (2009), the neo-Gothic St. Mark's in Peoria, Illinois, remodeled from 2002-2004 following its 1970s Modernist re-ordering, the neo-English Gothic Our Lady of Walsingham in Houston (2004) and the contemporary traditionalist St. Therese in Collinsville, Oklahoma (2000). Despite their stylistic diversity, these churches all exhibit shared formal characteristics, including an exterior which is visually distinct from the surrounding area, a hierarchical separation between nave and chancel, a prominent location of the altar and the tabernacle, and an integrated iconographic program. This paper argues that these commonalities derive from a shared understanding among proponents of traditionalism of the church building itself as a holy image: an icon.

ABSTRACT C

Choreographed Art and Architecture during the Reign of King Louis XIV

Jenalee Tirpak

Faculty Sponsor/Mentor: Jeanne-Marie Musto, Art History

Time: 2:00 PM | **Location:** Spencer 271

My presentation is about the reign of King Louis XIV of France and the establishment of the art of ballet. King Louis XIV expressed his power over French culture by applying principles of ballet to theatre, fine art and particularly architecture during his political reign. Using his knowledge of court ballet and his enthusiasm for spectacular performances, King Louis XIV choreographed his political power, prestige and dance talent into the static structure of his Palace at Versailles. While the ultimate origin of ballet is obscure, it is claimed to have developed from Italian Renaissance court dances. It is known that its establishment as an exercise and later an art form was greatly, if not single-handedly influenced by King Louis XIV. Painters during his reign portrayed the king in ballet positions and his obsession with spectacle can clearly be seen in his hunting lodge turned palace at Versailles. The interior and exterior designers of Versailles were well trained in creating areas to support grand festivals and expressions of power. While the overall look of Versailles is indeed grand, its axial layout and combination of gardens and construction can further be seen to mirror aspects of traditional ballets. The aspects of sculptures portraying ballet characters and garden pathways creating aerial arabesques further plays into my theory that King Louis XIV accomplished his goal of creating an architectural statement that embodied his political power, influence on the French people and his definite mark in history.

ABSTRACT D

Phylogeography of the troglobiotic millipede genus *Tetracion* (Callipodida: Abacionidae)

Stephanie F. Loria, Kirk S. Zigler, & Julian J. Lewis, *Biology*

Time: 2:00 PM | Location: Spencer 164

Millipedes are an understudied group. Little is known about their ecology, life history, and genetic diversity. Particularly neglected are the cave millipedes of eastern North America. Understanding the patterns and processes that determine their distribution and diversity in this region is an area of recent research. Here, we present a phylogeographic study of the cave-obligate (troglobiotic) millipede *Tetracion* (Callipodida: Abacionidae). This genus inhabits caves on the Cumberland Plateau in Tennessee and Alabama, a hotspot for cave biodiversity. Three species have been described: *T. jonesi* and *T. antraeum* from northern Alabama and southern Tennessee, and *T. tennesseensis* from south-central Tennessee. To examine genetic divergence within and between species in this genus we sequenced part of the mitochondrial cytochrome oxidase 1 gene from 53 specimens from 11 caves across the ranges of *T. jonesi* and *T. tennesseensis*. We found: (1) 7.9-8.6% genetic divergence between *T. tennesseensis* and *T. jonesi*, (2) little genetic variation (up to 1.4%) within each species, and (3) a total of ten haplotypes (six in *T. tennesseensis* and four in *T. jonesi*) that were either in individual caves or in geographically nearby caves. Our results are consistent with previous morphology-based species definitions showing *T. tennesseensis* and *T. jonesi* belonging to distinct taxa. They also suggest that gene flow is limited between caves since the majority of haplotypes are restricted to a single cave. In conclusion, our research contributes to the growing body of phylogeographic information about cave species on the Cumberland Plateau, and provides a point of comparison for future studies of troglobionts.

ABSTRACT E

Phylogeography of the land snail genus *Anguispira* (Gastropoda: Discidae)

Jia Pan

Faculty Sponsor/Mentor: Dr David Haskell, *Biology*

Time: 2:50 PM | Location: Spencer 164

Anguispira is a genus of small pulmonate land snails from the family Discidae found throughout the eastern United States. The genus consists of widely-distributed generalists species as well as specialist calciphilic species found only on limestone outcrops. A few of the calciphilic species are found on or near the Cumberland Plateau in close proximity to each other. This includes the endangered species *A. picta*, which is found only within a very restricted range in Sherwood, TN. The purpose of this study was to determine the genetic structure of *Anguispira* and compare this to the geographical distribution of *Anguispira* species. A secondary objective of this study was to determine the identity of a newly discovered population of snails resembling *A. picta* that was found in Sherwood. We collected tissue samples in a non-lethal manner from 139 individuals of 6 different *Anguispira* species from 19 different locations across the southeastern United States, and sequenced portions of the *cytochrome oxidase b* (Cob) and 16S mitochondrial genes. Phylogenetic analyses of the 16S sequence data show distinct clusters by species and location with fairly long divergence estimates. Our data thus supports the current identification of species and suggests that there is little gene flow between populations on different limestone outcrops. Also, both Cob and 16S sequence data indicate that the newly discovered *Anguispira* population is a genetically distinct population which appears to be a sister lineage to the *cumberlandiana/picta* clade. As such, our study provides insight into the phylogeography of land snails and also has significant implications for *A. picta* conservation.

ABSTRACT F

Synthesis of CdSe Quantum Dots using Various Metal Salts

Adrienne C. Borchardt & Deon T. Miles, *Chemistry*

Time: 2:20 PM | Location: Spencer 164

Several varieties of cadmium selenide (CdSe) quantum dots (QDs) were synthesized using different metal salts (cadmium perchlorate, purified cadmium chloride, anhydrous cadmium chloride, and cadmium sulfate) and water-soluble thiols. The spectral properties (absorption and emission spectroscopy) of these QDs were similar, regardless of metal salt. Mass spectrometry was performed on each to determine the

molecular weight of the QDs. The mass spectral data obtained were not conclusive. Since the QD solution has a pH of ~11, we believe that the QDs are multiply charged because of the carboxylate groups of the water-soluble thiols surrounding the semiconducting core. Because of the charges on the QDs, the molecular weight is difficult to determine. The pH of each QD solution was then adjusted to values near the pK_a of the water-soluble thiols to reduce the amount of charge surrounding the QD cores. These pH-adjusted solutions were subsequently analyzed using spectroscopic techniques, including mass spectrometry.

ABSTRACT G

“Testa dell’ Effebo”

Christopher McDonough, *Classical Languages*; Virginia Craighill, *English*; John Tilford, *Curator of Special Collections*; Breland Brumby ('11), *Chemistry & Classical Languages*; Mary Frances Dale ('12), *Art History*; Elizabeth Gilbert ('10), *English & Theatre*; & Jenny Liles ('13), *Chemistry & English*

Time: 2:40 PM | Location: Spencer 271

Our project falls into a category that is sometimes called “the secret life of objects.” In particular we explore what is to be learned about a small (25” high) statue from the University Archives, a 19th century bronze reproduction of a classical statuette of Dionysus which at one time belonged to Tennessee Williams. According to a letter Williams wrote in February, 1948, “Then I went to Naples. . . . I got some nice little art-objects there, including a copper statue of a boy in Pompeii, which I wrote a poem about” (Tennessee Williams, et al., *The Selected Letters of Tennessee Williams: 1945-1957* [New Directions, 2000] 164). From the foundry mark on the statue and archival records, it seems likely that the Sewanee statue, now housed in the Bonds Library in Gailor Hall (G19), is the very statue Williams bought in Naples. The poem he wrote about this piece, entitled “Testa dell’ Effebo” (“Head of a Young Man”), was published in *Harper’s Bazaar* (November 1948) and shortly thereafter reprinted in *New Directions* 12 (1950). The poem, reproduced below, while very formal in structure, is complex and even obscure in places. While it is not among the better-known of the author’s works, he seems to have held this poem in especially high regard. As an interviewer wrote in 1975, “[Williams] says that his only fully realized work is not Menagerie or Streetcar or any of the other celebrated plays but a short poem he wrote years ago, called “Testa dell’ Effebo” (Jed Horne, “A Playwright Lives His Greatest Drama: The Resurrection of Tennessee Williams,” *People Magazine* 20.3 [May 26, 1975]). Our analysis of the statue and poem will encompass a number of disciplines. We plan to:

- Establish the archival record of the statue
- Consider the statue in its classical context and in post-classical reception
- Analyze the chemical composition of the statue
- Give a formal analysis of the poem
- Place this “only fully realized work” within the Williams’ oeuvre

This multidisciplinary approach is our gift to a great playwright and great Sewanee benefactor, Tennessee Williams, upon the centennial of his birth (March 26, 1911).

Testa dell’ Effebo

Of Flora did his luster spring
and gushing waters bathed him so
that trembling shells were struck and held
until his turning let them go.

Then gold he was when summer was;
unchangeable this turning seemed
and the repose of sculpture told
how thinly gold his shoulder gleamed.

A cloud of birds awoke in him
when Virgo murmured half awake.
Then higher lifted birds and clouds
to break in fire as glasses break.

A lunatic with tranquil eyes
he must have been when he had dimmed
and that town burned wherein was turned
this slender copper cast of him.

ABSTRACT H

"The Hat Trick: Joyce's Use of the Hat in *Ulysses*"

Elisa Faison

Faculty Sponsor/Mentor: Dr. Lauryl Tucker, English

Time: 3:00 PM | Location: Spencer 271

Despite the wide array of Joyce criticism, there have been few focused readings on the use of clothing in *Ulysses*, and virtually nothing written which focuses solely on the metaphorical and metonymical implications of the hat. Joyce uses the hat in *Ulysses* as a mediator between the identity (one's public character) and the self (one's private character). Thus, the hat functions to both reveal and to hide character, fracturing the self. This paper is a close reading of the hat in the 'Circe' chapter of *Ulysses*, a section written as a dream-like drama whose characters are often imagined unconsciously by the protagonists Stephen Dedalus and Leopold Bloom. It is necessary to look at 'Circe' to discover the role of the hat in the novel as a whole, for 'Circe' functions as a microcosm of *Ulysses* in which exaggerations of the major themes and concerns suggested by the hat are presented. The hat plays its most explosive role in 'Circe', and it is only after this fulmination of costume and fragmentation that order and wholeness can be restored.

ABSTRACT I

"Being constrain'd with dreadful circumstance":

The Violence of Identity in Shakespeare's *The Rape of Lucrece*

Amy Nelson, English

Time: 3:30 PM | Location: Spencer 271

In the catalogue of William Shakespeare's female characters, one critical attribute (perhaps surprisingly) can be found among nearly all of them: a consistent identity (Paulina's assertive determination and Desdemona's docile passivity both exemplify this constancy). However, in Shakespeare's poem, *The Rape of Lucrece*, Rome's Lucretia, perhaps the most famous of all Shakespeare's heroines, never exhibits a coherent self. On the contrary, her capacity to adopt so many varying objects of identification results in a struggle with feminine identity that is not seen anywhere else in Shakespeare's works. This paper aims to explore why Lucrece's extraordinarily disparate self cannot find solace or security in any of the identifications she pursues, and how ultimately it is the tangible union established when the "harmful knife" is "sheathed in her harmless breast" that yields the only unaffected identity she has ever asserted. Not by adopting others' imagined sorrow in her head, but by forcing her flesh to absorb the material actuality of the knife, can Lucrece both allow her incongruent identity to acquit itself, and behold her soul finally "unsheath'd" from the "deep unrest" in which it had been trapped.

ABSTRACT J

Flaubert's Language: Limits & Transcendence

Emily Nielsen, C'11

Faculty Sponsor/Mentor: Dr. Kathryn Oliver Mills, French & French Studies

Time: 4:30 PM | Location: Spencer 271

This presentation, the culmination of an independent study in French literary analysis, examines the presentation of language in the work of the 19th-century novelist Gustave Flaubert. It draws on his novel *Madame Bovary* (1856) and his short story *Un Coeur Simple* or *A Simple Heart* (1877), both of which create a theme of language. Language, as it is used both by the characters and the narrator, is often portrayed as limited, as conveying meaning only partially or not at all. This is seen, for example, in passages which consist of stereotyped expressions devoid of meaning, in speech which distorts reality in order to manipulate others, and in problems of interpretation. Similarly, the narrator's use of techniques such as irony further calls into question the validity of linguistic reliability. However, this presentation argues that this bleak view is not the only portrayal of language found in Flaubert's works; rather, the very emptiness of language can allow it to be filled with emotional reality, and thus to transcend the limits of expression.

ABSTRACT K

The Changing Histories of Childhood Through Imagery

Faith Grabarz (*piece originally from Children & Childhood class*)

Faculty Sponsor/Mentor: Dr. Kelly Whitmer, History

Time: 2:20 PM | **Location:** Spencer 271

Historians of childhood have insisted upon a dramatic shift in the way in which children are represented in art from roughly 1700 to 1900. My project seeks to better understand this shift by analyzing paintings produced in the 18th century and their re-imagined versions as mezzotints from the early 20th century. In my paper I engage in comparative analysis in order to show how Enlightenment ideals such as childhood innocence and connection with nature are intensified/idealized in the mezzotints. In the paintings from the 18th c. I find/observe a realistic portrayal of enlightenment through use of images of children in nature. These paintings evolve from showing children not being too clean and perhaps tanned from their playing outside and other childhood endeavors to being pale, red cheeked, devoid of imperfections and an otherworldly clean. These images reflect the changing feelings of children as being perfect beings devoid of guilt or any negative connotations.

ABSTRACT L

Skepticism as Solution, a Reevaluation of Philosophical Skepticism as a response to Present Issues in Epistemology

Aaron Rutz

Phil 308 – Epistemology (Dr. James Peterman)

Time: 4:10 PM | **Location:** Spencer 271

In Modern Philosophy, it is widely understood that a philosophic skeptic is one who denies the possibility of human knowledge. In this definition, skepticism is viewed as the primary issue in Epistemology—the theory of knowledge—and the goal of Epistemologists is to refute the skeptic by showing a commitment to the impossibility of knowledge is incoherent. In response to this general project, a variety of knowledge theories have emerged since Descartes' famously declared his knowledge in the maxim "I think, therefore, I am," and various philosophers of the 20th and now 21st century have applied his and other principles in refuting the skeptic. Notwithstanding, no knowledge theory has gained ascendancy and competing knowledge theories often seek to refute each other, pointing out the incongruities of rival systems, in favor of their own. My research focuses on responding to this trend by re-evaluating skepticism, not as a problem, but in light of original arguments from the first proponents of a skeptical view. A writer from late antiquity, Sextus Empiricus, gave the first known outlines for a brand of skepticism from the Pyrrhonian School, thus Pyrrhonian skepticism. In his essays, Sextus looks at skepticism not as a philosophic argument (one opposing positive knowledge theories) but rather as an "attitude or mental condition." In this way, Sextus seeks to explain that skepticism is not an argument for the impossibility of knowledge but rather a suspension of belief in light of humanity's limited ability to perceive and understand the world. I argue a critical investigation Sextus' own writings, as well as that of a handful of contemporary philosophers who embrace skepticism as a possibility rather than an abstract has at least two potential benefit It can 1) help contemporary learners appreciate that skepticism is not by definition to be feared and avoided, and even more radically 2) suggest skepticism may actually prove a more reasonable Epistemological position than many others given that skeptics do not claim their status as conclusive.

ABSTRACT M

The relationship between home range and foraging behavior of semi-free ranging Lemur catta on St. Catherine's Island, Ga.

Michelle Ghandhi

Faculty Sponsor/Mentor: Dr. Timothy Keith-Lucas, Psychology

Time: 2:50 PM | **Location:** Spencer 151

Previous data shows that a positive relationship exists between home range and foraging behavior in many primates, including Lemur catta: increased range is correlated with increased home range. One study showed a positive correlation between home range size and metabolic need (Harvey and Clutton-Brock 1981). However, the animals used in this study inhabit Madagascar (where lemurs are endemic) and feed on a diet of mostly natural fruit (such as tamarind). The broad goal of this project was to determine how closely the semi-free ranging L. catta of St. Catherine's Island exhibit similar behavior of those in the wild, with special attention to foraging. In order to research this, four female Lemur catta were chosen as the subjects (JEN '96, SAL '08, JAY '08, NEW '92). All four animals are of different semi-free ranging troops. The two older females are dominant matriarchs (JEN, NEW) of their respective troops. All animals were born on St. Catherine's Island on which lemurs have been semi-free ranging since 1985. All troops are fed once a day on a diet of fruit and primate biscuit, though they are known to eat some vegetation on St. Catherine's. Focal samples were also recorded on the same four subjects with GPS collars opportunistically between 600 and 2000 hours, with at least twenty hours on each subject. Data collection occurred from June 6, 2010 to August 2, 2010. Using this data, we were trying to answer the following question: is there a positive correlation between foraging and home range of the lemurs (exposed to different conditions than those in Madagascar)? We found that the lemur with the greatest range (NEW) was doing the greatest amount of foraging and the individual with the smallest range was doing the least amount of foraging. If these lemurs were provided a different diet (both in amount and composition), it is reasonable to expect that range would increase as a result of increased foraging.

ABSTRACT N

Does An Apple A Day Keep the Autism Away?

A review of nutritional remedies to autism spectrum disorders

Chris Hague

Faculty Sponsor/Mentor: Dr. Volkmar, Yale Child Study Center

Time: 2:00 PM | **Location:** Spencer 151

I plan discuss the effects and effectiveness of nutritional remedies to treating autism. In the wake of the recent natural food craze and the fear of over medicating children, many parents have been turning to more "homeopathic" and natural remedies to treating autism and autistic behavior. However, like the majority of naturalistic cures and diets on the market, most of the evidence about their success is based on small case studies with dubious experimental designs that have many confounding variables such as concurrent therapy, use of additional medication drugs, and age. In this paper, I therefore plan to summarize the theoretical premises that this treatment is based on, research the current evidence, evaluate their credibility, and then, based on my findings, conclude with my own opinion of whether these treatments have any empirical backing to support them and, if not, what further research needs to be conducted and what considerations need to be considered when designing an experiment to test them whether parents should adopt them will be discussed.

