



It's Brain Food
2009 Centre College Symposium

THE SECOND ANNUAL CENTRE SYMPOSIUM

April 16-19

2009

The 2009 Symposium is sponsored by the
Dean's Office and all academic programs.

LETTER OF WELCOME

April 4, 2009

Dear Centre College and Danville Community Members,

Welcome to the second annual Centre College Symposium (RICE, It's Brain Food)!

The symposium showcases students' academic work over the past year. This event represents a larger effort on campus and in the college's strategic plan to increase students' opportunities for engaged and experiential learning. We want students to think of themselves as authors of knowledge, not just consumers of knowledge, and this event gives students the opportunity to share their knowledge with a larger scholarly community. In addition, we think the opportunity to present one's work in a conference-like setting as an undergraduate provides important preparation for graduate school, professional programs (e.g., law, medicine), and career development.

This year, 121 presentations celebrate the work of 149 students from 28 different academic programs on campus. The diversity of the presentations adds to our understanding of the world around us.

We invite symposium attendees to come and go from the Oral Presentations, Poster Presentations, Art Show, and John C. Young Presentations. When attending an Oral Presentation Session or a John C. Young Presentation, we ask that you not leave or enter the room during a speaker's talk out of courtesy to the speaker. Thank you for your consideration. Enjoy the symposium!

Sincerely,

Sarah Goodrum, Nayef Samhat, and Stephanie Fabritius

TABLE OF CONTENTS

2	Symposium Planning Committee
3	Schedule at a Glance
4	Oral Presentations, Part 1 of 2
7	Oral Presentations, Part 2 of 2
10	Poster Presentations
12	Art Show
13	John C. Young Presentations
14	Abstracts for Oral Presentations
29	Abstracts for Poster Presentations
36	Abstracts for Art Show
37	Abstracts for John C. Young Presentations
39	Author Index
40	Discipline Index

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SCHEDULE AT A GLANCE

THURSDAY, APRIL 16, 2009

2:00-3:30pm

- Oral Presentations, Part 1 of 2, Crouse Hall (3rd Floor, 4th Floor, and Vahlkamp Theater)

3:45-5:15pm

- Oral Presentations, Part 2 of 2, Crouse Hall (3rd Floor, 4th Floor, and Vahlkamp Theater)

5:30-6:30pm

- Poster Presentations, Norton Center for the Arts (Lobby)
 - Heavy hors d'oeuvres and beverages will be served

FRIDAY, APRIL 17, 2009

4:00-5:00pm

- Art Show, Jones Visual Arts Center (AEGON Gallery)
 - Light hors d'oeuvres and beverages will be served

SUNDAY, APRIL 19, 2009

5:00-9:00pm

- John C. Young Scholar Presentations, Old Carnegie (Evans-Lively Room)
 - Heavy hors d'oeuvres and beverages will be served

ORAL PRESENTATIONS, PART 1 of 2

Thursday, April 16, 2009

2:00-3:30pm

Crouse Hall and Vahlkamp Theater

Please note that each presenter will have 12 minutes to present plus 3 minutes for questions and answers. There will be a 5 minute break between each oral presentation to allow audience members to come and go to other oral presentation sessions. Out of courtesy to the presenters, please do not enter a session after the speaker's start time has commenced. Thank you for your understanding.

SESSION I, CROUNSE 301

Moderator and Timekeeper: John Perry

- 2:00pm 1. An Empirical Investigation of the Success of Dale Earnhardt, *Justin Roush, Economics*
- 2:20pm 2. Which Factors Might Affect Painting Prices In Auctions?, *Ying Wu, Economics*
- 2:40pm 3. Determinants of Mass Transit Ridership Rates in U.S. Metropolitan Areas, *Lindsay K. Maurer, Economics*
- 3:00pm 4. The Determinants of Discouraged Workers, *Zuhdi Hashweh, Economics*

SESSION II, CROUNSE 302

Moderator and Timekeeper: Stephanie Dew

- 2:00pm 5. The Science of Chocolate, *Ryan J. Smith, Biochemistry and Molecular Biology*
- 2:20pm 6. Alkaline Salt Materials Property and Aging Study, *Katie Hutchinson, Morrell (Y-12 National Security Complex), and Garlea (Y-12 National Security Complex), Biochemistry and Molecular Biology*
- 2:40pm 7. Therapeutic Efficacy of T Cells Specific for Human Tyrosinase in the Treatment of Melanoma, *Christopher J. Fleming, Naga (Medical University of South Carolina), and Montero-Diaz (University of Miami), Biochemistry and Molecular Biology*
- 3:00pm 8. Determining SR-B1s Structure: a Biochemical Space Odyssey, *Rhiannon Ledgerwood, Papale (Medical College of Wisconsin), and Sahoo (Medical College of Wisconsin), Biochemistry and Molecular Biology*

SESSION III, CROUNSE 313

Moderator and Timekeeper: Daniel Smith

- 2:00pm 9. The Fire Flume, *Bryce Meredith, English and Creative Writing*
- 2:20pm 10. Proustian Poetry, *Rachel Dawson, English, French and Creative Writing*
- 2:40pm 11. Analyzing the Writer Within, *Sarah Humphrey, English and Creative Writing*
- 3:00pm 12. The Wreck, *Allie Barden, Classics*

SESSION IV, CROUNSE 315

Moderator and Timekeeper: Jeff Fieberg

- 2:00pm 13. Improving the Stability of an Ultra-Short Pulse Fiber Laser, *John Gruenewald, Physics*
- 2:20pm 14. Evidence for Differential Hawaiian and Louisville Plume Motions Based on $^{40}\text{Ar}/^{39}\text{Ar}$ Geochronology, *Molly E. Lindle, Lauren E. Colwell (Carleton College), A.A.P. Koppers (Oregon State University), and R.A. Duncan (Oregon State University), Physics and Geophysics*
- 2:40pm 15. The Expanding Universe, *Willie Polio, Physics*
- 3:00pm 16. Beating the Heat, Cataglyphis Style, *Laith Sweis, Biology*

SESSION V, CROUNSE 316

Moderator and Timekeeper: Rick Axtell

- 2:00pm 17. Christian Theology and the Environmental Crisis, *Ben Cooley, Religion*
- 2:20pm 18. An Islamic Afterlife: Maturation from Within, *Morgan Smith, Religion*
- 2:40pm 19. Hare Krishnas in Hawaii, *Laura Behrendt, Anthropology*
- 3:00pm 20. Living in Hope in Kentucky: An Assessment of the HOPE VI Redevelopment Project, *Jeff Hortillosa, Jeff Glidden, Michelle Tooley (Berea College), Arlett Iliana-Franco (Berea College), and Ehidiarnhen Akhetuamhen (Berea College), Religion*

SESSION VI, CROUNSE 401

Moderator and Timekeeper: William Garriott

- 2:00pm 21. The Emergence of the New Donor Class: Internet, Money, Participation and Politics in the 21st Century, *Rachael Dahlman, Government*
- 2:20pm 22. Will Big Box Stores Last in the Big City? An Analysis of Local Governments and Urban Opposition, *Tate Bennett, Government*
- 2:40pm 23. The Catholic Vote in the 2004 and 2008 Elections: Changing Alliances Over Time, *Emily Gallt, Government*
- 3:00pm 24. Occupational Hazards: A Study of the U.S. Occupations of Germany, Japan and Iraq, *Kate Anderson, International Studies*

SESSION VII, CROUNSE 405

Moderator and Timekeeper: Jillian Kenyon

- 2:00pm 25. Lies, Damn Lies, and Voir Dire, *Katt McGinley, Psychology*
- 2:20pm 26. The Impact of Family on the Self-Esteem of Mental Patients, *Nina Marijanovic, Psychology*
- 2:40pm 27. Gaining Knowledge in the Field of Dentistry and Its Business Demands with Specific Emphasis on Oral Surgery, *Shelby Schuttera, Psychobiology*
- 3:00pm 28. Damage from Alcohol after Two Days, *Carey Shaner, Ayumi Deeny (University of Kentucky), and Kim Nixon (University of Kentucky), Psychobiology*

SESSION VIII, CROUNSE 468

Moderator and Timekeeper: Amos Tubb

- 2:00pm 29. Sadat: The Agent of Desperate Internal Logic, *Sami Jiryis Sweis, History*
- 2:20pm 30. Pocketbook Patriotism: The Intersection of Country Music and Politics in the Aftermath of the September 11th Terrorist Attacks, *Joseph Glenn McGill, History*
- 2:40pm 31. A Town That Turned Their Backs in the Face of Murder, *Erica Sanchez, Spanish*
- 3:00pm 32. Barn Again: The Renewal and Reuse of American Barns, *Kathy Martinolich, Art History*

SESSION IX, VAHLKAMP THEATER

Moderator and Timekeeper: Barbara Hall

- 2:00pm 33. Circle of Seven and Untamable Sky, *Corwyn Wyatt, Music*
- 2:20pm 34. Gilded Smile, *Zara Horton-Thomas, Music*
- 2:40pm 35. Modern Arrangements of Traditional Music, *Clayton Carden, Music*
- 3:00pm 36. Three Pages, *Paul Adams, Music*
- 3:20pm 37. Reminiscence and Untitled, *Kelsey Lownds, Music*

ORAL PRESENTATIONS, PART 2 of 2

Thursday, April 16, 2009

3:45-5:15pm

Crouse Hall and Vahlkamp Theater

Please note that each presenter will have 12 minutes to present with 3 minutes for questions and answers. There will be a 5 minute break between each oral presentation to allow audience members to come and go to other oral presentation sessions. Out of courtesy to the presenters, please do not enter a session after the speaker's start time has commenced. Thank you for your understanding.

SESSION X, CROUNSE 301

Moderator and Timekeeper: Andrea Abrams

- 3:45pm 38. Importance of Lay Beliefs to Illness Behavior: A Cross-cultural Examination, *Becca Todd, Anthropology*
- 4:05pm 39. Pretty: Celebrating Culture through the Costume of the Mardi Gras Indians, *Erin Menard, Art History*
- 4:25pm 40. Honduras and the Garifuna People the Coast, *Erica Sanchez, Spanish*
- 4:45pm 41. Culture of Violence Against Women, *Alison Denbow, Emily Ferguson, and Camille Perez, Anthropology and Gender Studies*

SESSION XI, CROUNSE 302*

Moderator and Timekeeper: Phyllis Bellver

***Please Note: The last three presentations in this session will be conducted in Spanish.**

- 3:45pm 42. Agua Pura, Pura Vida: A Project of the Centro Marista de Desarrollo to Bring Pure Water to Emiliano Zapata Sur, *Melissa Raley, Spanish*
- 4:05pm 43. El español en las Islas Filipinas, *Jeff Hortillosa, Spanish*
- 4:25pm 44. Los Idiomas de la Isla de Roatan, Honduras, *Amanda Rapone, Spanish*
- 4:45pm 45. A Sociolinguistic Look at Argentina, *Michael Henry, Spanish*

SESSION XII, CROUNSE 313

Moderator and Timekeeper: Alex McAllister

- 3:45pm 46. Master of the Infinite, *Laura Hench, Mathematics*
- 4:05pm 47. An Overview of Ordinal Arithmetic, *Christopher Robinson, Mathematics and Physics*
- 4:25pm 48. Measuring User Experience in Large Simulated Networks, Like the Internet, *Brittany Devine and Kevin Mills (Information Technology Laboratory National Institute of Standards and Technology), Computer Science*
- 4:45pm 49. Policy and Pedagogy: The Practice of Implementing Legislative Laws into Realistic Educational Procedures, *Drew M. White, Education*

SESSION XIII, CROUNSE 315

Moderator and Timekeeper: Rosa Slegers

- 3:45pm 50. Black Swans and the Adaptable Ontology, *Matthew Howell, Philosophy*
- 4:05pm 51. Stick Man's Odyssey, *Phil Lederer, Philosophy*
- 4:25pm 52. Seafaring in Aeneid X: Aeneas' Arrival and Turnus' Departure, *Cornelia Gordon, Classics*
- 4:45pm 53. A Psychological Approach to Virtue Ethics, inspired by Legally Blonde, *Adam Spangler, Philosophy*

SESSION XIV, CROUNSE 316**Moderator and Timekeeper: Melissa Burns-Cusato**

- 3:45pm 54. Inter-troop Dominance as Inferred by Stress Indicators of Cercopithecus Aethiops Sabaeus at the Barbados Wildlife Reserve, *Sam Royalty, Christopher J. Fleming, and Julie Crocker, Psychobiology*
- 4:05pm 55. Spatial Learning in a Transgenic Mouse Model for Accelerated Aging, *David Cox, Brian Saulino, and Melissa Burns-Cusato, Psychobiology*
- 4:25pm 56. Stress Variations in Captive Male Gorillas, *Keri Jamison and Brent White, Psychobiology*
- 4:45pm 57. The Reproductive Success of Female Quail is Enhanced by Sexual Conditioning, *Emily Clare Sither, Psychobiology*

SESSION XV, CROUNSE 401**Moderator and Timekeeper: Mike Fabritius**

- 3:45pm 58. An Econometric Model of the Salary Structure for Major League Baseball Pitchers, *Kyle Borders, Economics*
- 4:05pm 59. An Analysis on the Impact of Time Use Variables and BMI, *Natalie McIntyre, Economics*
- 4:25pm 60. Chamber of Commerce Internship, *Mary Kate Clodius, Economics*
- 4:45pm 61. Lexington Investment Company Internship (Centre Term 2009), *Jay Russell, Economics*

SESSION XVI, CROUNSE 405**Moderator and Timekeeper: Beau Weston**

- 3:45pm 62. Our Divorce Culture, *Scott Meltzer, Sociology*
- 4:05pm 63. The Affect of Pre-Marital Cohabitation and Level of Religiosity on Divorce, *Sarah Hargis, Sociology*
- 4:25pm 64. Associations Between Years Served in the Armed Forces and Attitudes Towards Family Life, *Rachel Byrd, Sociology*
- 4:45pm 65. The Role of Peer Relationships on Juvenile Delinquency, *Jasma D. Mendez, Sociology*

SESSION XVII, CROUNSE 468**Moderator and Timekeeper: W. David Hall**

- 3:45pm 66. Southwest Airlines: Aircraft Demand and Learning about the Business, *Helena Josic, Financial Economics*
- 4:05pm 67. Practice of Entrepreneurship, *My Vu Thuy Vo, Financial Economics*
- 4:25pm 68. Corporate Finance Internship, *Chris Conkright, Economics*
- 4:45pm 69. Northwestern Mutual Internship Experience, *J.C. Spalding, Economics*
- 5:05pm 70. Chamber of Commerce Internship, *Whitney Davis, Economics*

SESSION XVIII, VAHLKAMP THEATER

Moderator and Timekeeper: Andrea Heckman

- 3:45pm 71. The Amir Sound, *Seth Amir, Music*
- 4:05pm 72. From Stable to Table: The Future of Farming in Our Old Kentucky Home, *Kari Walker, Rachel Skaggs, Michael Keach, Josh Blair, and Sergio Palleroni (University of Oregon-Portland), Humanities*
- 4:25pm 73. Sister, *Landon Berry, Creative Writing*
- 4:45pm 74. As You Like It, *Cameron Comstock, Kayt Bentley, William P. Burgess, Katt McGinley, Dana Smith, and Stuart White, English*
- 5:05pm 75. BRAINS, *Jeff Hortillosa, Creative Writing*

POSTER PRESENTATIONS

Thursday, April 16, 2009

5:30-6:30pm

Norton Center for the Arts, Lobby

Heavy hors d'oeuvres and beverages will be served

76. Backyard Archaeology: A Preliminary Survey of the Salt River Site, *Evan Kutzler, Anthropology*
77. Internship at The Great American Dollhouse Museum, *Chris Baumann and Lori Kagan-Moore (The Great American Dollhouse Museum), History, Anthropology and Sociology, and Museum Studies*
78. Detoxifying Footpads, *Sarah Couch, Biochemistry and Molecular Biology*
79. Retinol Esterification in the Hepatopancreas of the Crayfish (*Procambarus clarkii*), *Becky Lindhorst, Bryan Fioret, Chase Palisch, Anna Canelas, and Stephanie Dew, Biochemistry and Molecular Biology*
80. Host-finding Sensory Mechanisms of Gnathiid Isopoda, *Benjamin Tuttle and Eric Brown, Biology*
81. An Investigative Report: Water Quality in Clarks Run-American Greetings, *Sarah Wilson, Jacquie Kalugyer, and Emily Hogancamp, Biology*
82. Molecular Genetic Study of Isolation Populations of the Northern Studfish (*Fundulus Catenatus*) Living in Four Watersheds in Central Kentucky, *Meredith Angel and Philip Crain, Biology*
83. Genetic Divergence among Populations of Bahamian Pupfish *Cyprinodon Variegates*, *Blair Murphy, Biology*
84. Ontogenetic Shifts in Timing of Host Infestation by Parasitic Gnathiid Isopod Larvae on Caribbean Coral Reefs, *Whitney Sears and Jessica Wheeler, Biology*
85. Factors Controlling Cell Cycle Regulation: More Shocking News from Plant Biology, *Ana Santin, Ashley Colagross, G. Curlango Rivera (University of Arizona), H. D. Van Elten (University of Arizona), and M.C. Hawes (University of Arizona), Biochemistry and Molecular Biology*
86. Spectroelectrochemical Sensors: Comparing Effects of Ionic Strength on Sensor Response in Nafion and SSEBS Films, *Carla Estridge, Chemistry*
87. Helium Atom Confined in an Impenetrable Sphere, *Chase Wilson, Chemistry*
88. Biosensing with Functionalized Gold Nanotubes, *Emily Green, Chemistry*
89. Virtual Screening - Mur Enzymes, *Jordan Feigerle, Chemistry*
90. Selected Centre College Building Energy Consumption, *Brian Coxon and Cody Buell, Environmental Studies*
91. Déclitc Délice, *Kasey Jackson, French*
92. The Globe in 2050, *Greg Brooks, Emily Arbegust, Patrick Garvey, and Alex Headley, International Studies*
93. Our Global Future: The World in 2050, *Morgan Lynn, Abby Woerhle, and Nick Laferriere, International Studies*
94. The World in 2050, *Danielle Myers, International Studies*
95. "Foursee" the Future: An Investigation in Global Trends, *Brittany Coppola, Chris Herrmann, Colin Misbach, and Grant Sharp, International Studies*
96. Mathematical Modeling of Fatty Acid Oxidation in Skeletal Muscle Cells Sheds new Light on Obesity, *Sara Haque and Kara Kruse (Oak Ridge National Lab), Mathematics*
97. Modeling 6 cm OH Maser Emission in W49, *Brice Hamilton, Physics*
98. Alternative Uses of Tobacco, *Katya Alimova and G. Wagner (University of Kentucky), Plant and Soil Sciences*

99. Does Prior Copulation Affect a Male Japanese Quail's Mate Preference?, *Amanda Glueck, Samantha Bottom, and Brian Cusato, Psychobiology*
100. Visual-spatial Attention in Athletes and Non-athletes, *PJ Gagnon and Kyle Saylor, Psychobiology*
101. Exploring Hemisphere Differences in Language Production, *Rachel Skaggs, Psychology*
102. A Comparison of Attitudes Toward Body and Self Between Division I and Division III Athletes, *Rebecca Rhule, Charlotte Jones, Melissa Burns-Cusato, and Rick Grieve (Western Kentucky University), Psychology*
103. Semantic and Grammatical Influences on Homophone Substitution Errors, *Tara Milburn, Emily Boyle, and Katherine White, Psychology*
104. College Students Preferences for Future Children: Sons versus Daughters, *Kelsey Snavelly and Mykol Hamilton, Psychology*
105. Costume Design for Dracula in Space, *Shannon Eblen, Dramatic Arts*
106. "The Importance of Being Earnest" Set Design, *Kristen Robinson, Dramatic Arts*
107. Scenic Design-Picasso at the Lapin Agile, *Mary Whitehurst, Dramatic Arts*

ART SHOW

FRIDAY, APRIL 17, 2009

4:00-5:00pm

Jones Visual Arts Center, AEGON Gallery

Light hors d'oeuvres and beverages will be served

- 108. Monster Water Jug, *Carol Denney, Art*
- 109. Tiny Coil Tall Vase, *Carol Denney, Art*
- 110. Study of Odilon Redon's "Les Yeux Clos," *Kayley Jerrell, Art*
- 111. Sit Alone in the Dark, *Kayley Jerrell, Art*
- 112. Will You Marry Me?, *Kayley Jerrell, Art*
- 113. Haniwa Woman, *Annie Schultz, Art*
- 114. Portraits, *Ben Tuttle, Art*

Please Note: Additional works of art not listed here will be on display in the AEGON Gallery. For information on the additional works, please visit the Gallery.

JOHN C. YOUNG PRESENTATIONS

SUNDAY, APRIL 19, 2009

5:00-9:00pm

Old Carnegie, Evans-Lively Room

Heavy hors d'oeuvres and beverages will be served

- 5:00pm 115. From Mineshaft to Mountaintop: Appalachian Folk Medicine in the 21st Century, *Sarah C. Baird, Anthropology (Professor Phyllis Passariello)*
- 5:35pm 116. Characterization of Tyrosine Hydroxylase Interneurons in the Developing Cerebral Cortex of Rats, *Talha Ijaz, Biochemistry and Molecular Biology (Professor Stephen Asmus)*
- 6:10pm 117. Unraveling the Fabric of Fortune: Textiles in Virginia during the American Civil War, 1861-1865, *Virginia E. Reynolds, History (Professor Clarence Wyatt)*
- 6:45pm 118. Empirical Analysis of the Chinese Housing Market, *Qianyu Yang, Economics (Professor David Anderson)*
- 7:20pm 119. A Spectroscopic Study of Volcanic Gases on a Thin-Film Salt Surface: Insight into Post-Eruptive Atmospheric Conditions, *Molly Lindle, Chemistry (Professor Keith Dunn)*
- 7:55pm 120. MultiMedea: Retelling an Ancient Story in Digital Video, *Dan Burkey, Dramatic Arts (Professor Patrick Kagan-Moore)*
- 8:30pm 121. Consequences of Conviction: The Law, Reentry, and Challenges Facing Kentucky's Female Offenders Upon Release, *Jillian Kenyon, Sociology (Professor Sarah Goodrum)*

ABSTRACTS: ORAL PRESENTATIONS

1. An Empirical Investigation of the Success of Dale Earnhardt, *Justin Roush, Economics*
Mentor: Bruce K. Johnson, Economics

An Empirical Investigation of the Success of Dale Earnhardt is an empirical exploration of Dale Earnhardt's success in NASCAR Cup Series races from 1990 to his death in 2000. It uses both a linear approximation and a probit regression model with two different proxies for success: total points and the probability of finishing in the top 5 of a given race respectively. The models, though a bit inconclusive, did relay that Earnhardt may have been more of a team player and less of a ruthless competitor than many thought.

2. Which Factors Might Affect Painting Prices In Auctions?, *Ying Wu, Economics*
Mentor: Marie Petkus, Economics

In this paper, I estimated an empirical model of painting prices in auctions using a set of pooled-section data on modern paintings from 2005 to 2008. I find that there are some key factors that help explain the auction price of the paintings: the auctioneer pre-sale estimates, the area, the material, the style, the subject matter of painting, and the year the auction took place. However, some factors, which are theoretically significant, are not statistically significant in the results, such as an artist's signature and the age of the artist when a painting was executed. Additionally, an art-return model on the subsample is tested. Due to the small number of observations in this subsample, this model does not offer much explanation. For future research, I would like to extend my sample to a longer period of time as well as to a larger range of paintings. In this way, the sample will be closer to the true population and will result in a more accurate measurement of price determinants.

3. Determinants of Mass Transit Ridership Rates in U.S. Metropolitan Areas, *Lindsay K. Maurer, Economics*
Mentor: Bruce K. Johnson, Economics

The role of mass transit systems in U.S. metropolitan areas promises to become increasingly important as the environmental, economic, and social consequences of automobile dependency become more pressing. The purpose of this work is to identify the demographic, socioeconomic, and land-use factors that influence the decision to use public transportation. Employing data compiled primarily from the National Transit Database and the Census Bureau, this econometric study examines a cross-section of 83 U.S. metropolitan areas to determine the relative impacts of various urban characteristics on mass transit ridership. The model developed through this project suggests several variables that have a significant impact on the use of metropolitan public transportation, including service concentration, population density, employment centralization, and crime rates. The study thus reveals multiple areas in which leaders may strive to implement policies favorable to the use of mass transit, thereby reducing the extent of automobile dependency in our nation.

4. The Determinants of Discouraged Workers, *Zuhdi Hashweh, Economics*
Mentor: Marie Petkus, Economics

As of February of 2009, the unemployment rate in the U.S. was 8.1%. Even this figure does not present a complete picture because it does not include those who have dropped out of the workforce due to labor market inefficiencies, otherwise known as discouraged workers. This paper empirically examines the determinants of discouraged workers.

5. The Science of Chocolate, *Ryan J. Smith, Biochemistry and Molecular Biology*
Mentor: Stephanie Dew, Biology

During the independent study course, we researched various properties of chocolate and the processing involved in production. We then applied this research toward the tempering process and fat content manipulation. One application focused on single source chocolate from different parts of the world, observing the varying taste and hardness of the fat. Other techniques focused on proper tempering to ensure the correct snap. The single source observations were consistent with literature, with the chocolate nearest the equator having the hardest fat content. Our tempering technique was adequate, though modification yielded excellent results of hard chocolate. The observations and results we found are significant in that they confirm previous research presented in the material we read.

6. Alkaline Salt Materials Property and Aging Study, *Katie Hutchinson, Morrell (Y-12 National Security*

Complex), and Garlea (Y-12 National Security Complex), Biochemistry and Molecular Biology

Alkaline salts such as lithium hydride (LiH) have been proposed as a hydrogen storage medium for an alternative fuel economy. The thermophysical properties and environmental characteristics of the salt must be understood in order to manipulate the materials performance and to prevent catastrophic failure due to the aging process. Several analytical techniques were used to assess these properties and aging phenomenon. These include thermomechanical analysis (TMA) for coefficient of expansion, dynamic vapor sorption (DVS) using thermogravimetric analysis (TGA) with a humidity controlled chamber, and Fourier Transform Infrared (FTIR) and Diffuse Reflectance Infrared Fourier Transform (DRIFT) for surveillance of the salt when exposed to various environmental conditions. Results show a multi-step pathway for aging of the salt and release of hydrogen depending on the temperature, kinetics, and humidity exposure levels.

7. Therapeutic Efficacy of T Cells Specific for Human Tyrosinase in the Treatment of Melanoma, *Christopher J. Fleming, Naga (Medical University of South Carolina), and Montero-Diaz (University of Miami), Biochemistry and Molecular Biology*

Adoptive T cell therapy (ACT) involves transfer of autologous ex vivo expanded T cells in patients for the treatment of tumors. One of the problems that we addressed was T cell persistence and their ability to recognize tumors. We relied on the use of a novel T cell receptor (TCR) transgenic mouse. This Human Tyrosinase TIL-derived Transgenic Mice (H3T) carries HLA-A2 restricted TCR that recognizes tyrosinase epitope (YMDGTMSQV) presented on the human MHC class I molecule. We hypothesized that H3T and H3T-A2 mice will successfully reject B16 melanoma cells that were modified to express HLA-A2, and would succumb to tumor progression after injection of wild type B16 melanoma cells. Our results from in vivo tumor challenge experiments show that B16-A2 melanoma (but not B16 wild type) was significantly reduced in the H3T and H3T-A2 mice leading to longer survival.

8. Determining SR-B1s Structure: a Biochemical Space Odyssey, *Rhiannon Ledgerwood, Papale (Medical College of Wisconsin), and Sahoo (Medical College of Wisconsin), Biochemistry and Molecular Biology*

The number one killer in the United States is heart disease. A factor in heart disease is having low levels of HDL, high density lipoprotein, in the blood. SR-B1, a cell receptor, is important in HDL uptake in the body. SR-B1 was previously thought to have only two transmembrane regions. Additionally not much was known about the mechanism for the uptake of HDL in SR-B1. Through site-directed mutagenesis, HDL binding assays, FPLC and western blotting, it was determined that SR-B1 has at least five transmembrane regions with a few essential amino acids and that SR-B1 may oligomerize to form a channel through which HDL can pass into the cell. With this research we can discern the structure of SR-B1 which may help later in the creation of possible therapies for heart disease.

9. The Fire Flume, *Bryce Meredith, English and Creative Writing*
Mentor: Daniel Smith, English

The short story, The Fire Flume, provides a third person account of a ten-year-old boy, Ernie, and his first experience with a county fair in small town Kentucky. Ernie is initially excited about the prospect of riding the fair's best roller coaster, the Fire Flume, yet when he is faced with the reality of actually riding the coaster, he begins to have second thoughts. The remainder of the story focuses on Ernie's internal struggle of whether or not to get on the ride, despite his cousin's continuous urging to ride the Fire Flume. The story gives the reader insight into the mind of a ten-year-old, while providing nostalgic plot. Additionally, The Fire Flume leaves the reader with a better understanding of small town life in Kentucky.

10. Proustian Poetry, *Rachel Dawson, English, French and Creative Writing*
Mentor: Ken Keffer, French and German

One of the many facets of Marcel Proust's *la recherche du temps perdu* is its overarching presentation of the maturation of the artist. Taking this as a jumping-off point to tackle the work as a whole, I've compiled examples of my maturation as a poet: a series of poems dealing either directly with Proustian characters and themes, or more abstractly with my own experiences as they can receive application of Proustian ideas. My reading will thus breach topics such as: nature, memory, the act of reading, networks of over-thinking, imagination v. reality, anticipation yielding to fulfillment, etc. In this way, my own creative works mirror *la recherche* insofar as it is a semi-autobiographical account of the process of becoming a writer, reintroducing many elements of the Proustian world to a more contemporary audience.

11. Analyzing the Writer Within, *Sarah Humphrey, English and Creative Writing*

Mentor: Daniel Smith, English

This work will analyze my creative writing process and the thematic elements and motifs I employ as a writer. I will consult the work of Hill's Writing in General, examining how my own work tends to follow or depart from his narrative guidelines. I will focus on two of my own short stories: one from the fall and one from this spring, comparing and contrasting their themes, characters, etc. Although different in tone and subject matter, my two stories have similar themes, and parallel each other in how they develop and unfold. Through this self-analysis of my own writing, I have learned much about myself as a writer and as an individual. For most, if not all, writers, this is why creative writing calls to us. And for drawn-in readers, the story may entertain, but the human themes engage.

12. The Wreck, *Allie Barden, Classics*
Mentor: Jim Morrison, Classics

The wreck is a short story I wrote in my Centre Term class—Shipwrecks and Castaways in Literature and Film—for my final project. My inspiration for this short story came from a painting done by William Turner called "Snowstorm." This story is about a fictional character that was on the ship pictured and is a retelling of how he became stranded alone on a desert island.

13. Improving the Stability of an Ultra-Short Pulse Fiber Laser, *John Gruenewald, Physics*
Mentor: Jason Neiser, Physics

This research investigates the design and construction of an all-fiber laser that implements a novel method for generating ultra-short pulses of light. A nonlinear optical loop mirror (NOLM) is a fiber-based component that is completely reflective for low intensity pulses, but portions of high intensity pulses can be transmitted. Upon many round trips through a laser cavity, a pulse with sufficient power will be shortened by the NOLM, enabling pulses with duration on the order of femtoseconds. The NOLM we have designed uses polarization maintaining fiber (a special type of highly birefringent fiber) in order to increase the stability of the laser. An additional stabilizing element used is an all-fiber spectral filter that is currently under development. The operation of these two components in the cavity will be explained.

14. Evidence for Differential Hawaiian and Louisville Plume Motions Based on $^{40}\text{Ar}/^{39}\text{Ar}$ Geochronology, *Molly E. Lindle, Lauren E. Colwell (Carleton College), A.A.P. Koppers (Oregon State University), and R.A. Duncan (Oregon State University), Physics and Geophysics*
Mentor: Keith Dunn, Chemistry

In this study we present new $^{40}\text{Ar}/^{39}\text{Ar}$ age data that contribute to an updated age progression for the Louisville seamount trail. The Louisville trail is comparable to the Hawaii-Emperor seamount trail, as both represent intra-plate volcanism and Pacific plate motion over a similar time interval (~80 Ma to present). These new data confirm a non-linear but systematic age-progressive trend that, when considered with reference to the most recent absolute plate motion model (WK08G) from Wessel and Kroenke (2008), facilitates a direct comparison to the Hawaii-Emperor age progression. It is observed that at the older end of the Louisville trail, the measured ages are systematically older than both the WK08G predictions and the Hawaiian seamounts, with positive offsets ranging up to 6 Myr. Here we report that these deviations most likely indicate differential Hawaiian and Louisville plume motions and/or uncertainties in the current location of the Louisville hotspot.

15. The Expanding Universe, *Willie Polio, Physics*
Mentor: Alex McAllister, Mathematics

The vast majority of human knowledge deals with the scope of our planet. While we still have much to learn about the way Earth and its inhabitants function, we know relatively little about the workings of our larger universe. By understanding the fundamental workings of the universe, we may hope to solve some of Earth's greatest mysteries. This presentation focuses on the development of man's understanding about the origin and nature of the universe. In the past one-hundred years, man's understanding of the universe has changed dramatically. Hubble telescope captured images in unprecedented clarity from outside the Milky Way galaxy, while Einstein's Theory of Relativity provided an unparalleled model of the universe. The Big Bang Theory helps explain the origin of everything around us and cosmologists continue their efforts to predict the future of our universe.

16. Beating the Heat, Cataglyphis Style, *Laith Sweis, Biology*
Mentor: Chris Barton, Biology

Ants in the genus *Cataglyphis* live a desert existence that is too severe for most organisms. In order to live in such an environment, these ants have evolved a suite of traits and adaptations to withstand the effects of heat. Adaptations include genetic, anatomical, physiological, morphological, behavioral, and navigational adaptations that have allowed this genus to survive. Genetic adaptations involve the heat shock response and heat shock proteins. Anatomical and physiological adaptations allow this ant to avoid desiccation and navigate the desert. Morphological adaptations include worker size polymorphisms and ant legs. Behavioral adaptations, in smaller species, aide in thermotolerance without the benefit of larger worker sizes. Navigational adaptations involve how this ant uses a type of visual memory to journey the desert. Because of these observations on *Cataglyphis*'s life, it is possible to understand the selective factors and energy tradeoffs made by other opportunistic organisms that inhabit this extreme environment.

17. Christian Theology and the Environmental Crisis, *Ben Cooley, Religion*
Mentor: Rick Axtell, Religion

The purpose of this paper is to: 1) analyze how Christianity has contributed to the development of the Western worldview, a worldview which has been a casual factor to our current environmental crisis; and 2) evaluate the traditional Judeo-Christian theological norms and Christian eco-theologies which might be helpful in building a less environmentally-destructive society. The paper starts by introducing Lynn White's thesis that Christianity is the root of the ecological crisis. By reviewing the various eco-theologies within the Christian tradition I attempt to show that the issue is not only far more complex, but that Christianity has valuable resources which could work to alter our environmentally-destructive worldview. Many overlapping theologies exist within Christianity which might be helpful, but this paper concludes that a fusion of eco-theologies could provide Christianity with the means to join with other environmental movements to work on the most pressing issue of the 21st century.

18. An Islamic Afterlife: Maturation from Within, *Morgan Smith, Religion*
Mentor: Satnam Mendoza-Forrest, Religion

Seeking to explore the internal development of the Islamic belief in an afterlife, this research and presentation outlines the basic standard of Sunni theological beliefs concerning afterlife events. I assert that although there are similarities between Islam, Christianity, Judaism, and Zoroastrianism, the Islamic belief in an afterlife is predominately reflective of the core tenants of Islam, such as tawhid, Muhammad's role as the seal of the prophets, and Allah's mercy and wrath. My presentation does not approach this argument through a comparative analysis, but does include minor references to other religions' afterlife beliefs. Discussion of topics such as the dichotomy between creation and return, time in the grave, the Day of Judgment, and imagery of Paradise and Hell provide evidence of the internal development of afterlife beliefs within Islam.

19. Hare Krishnas in Hawaii, *Laura Behrendt, Anthropology*
Mentor: Phyllis Passariello, Anthropology

This paper details a young undergraduate's summer experience as she unknowingly discovers the practices and beliefs of Hare Krishnas living in Hawaii. Coming to the Big Island in 2008 for an environmental studies internship, the undergraduate lived with followers of the International Society for Krishna Consciousness, commonly known as the Hare Krishnas. This paper includes the history of the International Society for Krishna Consciousness, but focuses on the author's observations of the daily lives of Hare Krishnas in Hawaii, as evidenced by the Logan family.

20. Living in Hope in Kentucky: An Assessment of the HOPE VI Redevelopment Project, *Jeff Hortillosa, Jeff Glidden, Michelle Tooley (Berea College), Arlett Iliana-Franco (Berea College), and Ehidiamhen Akhetuamhen (Berea College), Religion*
Mentor: Rick Axtell, Religion

HOPE VI is a government funded program which aims to replace the most blighted of U.S. housing projects. Since 1992, HUD has demolished thousands of low-income housing units, and replaced them with mixed-income neighborhoods. This has created a number of issues, most notably the permanent displacement of former residents from their homes and a net loss of affordable housing. During the summer of 2008, one professor and two students of the Centre College Religion department, partnered with one professor and two students from Berea College, and in conjunction with the civic organization CLOUT, investigated the effects of Louisville's most recent HOPE VI project on the lives of the former residents. The goal of the research was rather qualitative: to construct a personal narrative of the former residents. Research methods included extensive reading, interviews with former residents, city officials, and civic leaders.

21. The Emergence of the New Donor Class: Internet, Money, Participation and Politics in the 21st Century, *Rachael Dahlman, Government*
Mentor: William Garriott, Government

This paper argues that the donor class has begun to expand particularly in this past election cycle from the wealthiest Americans giving over \$200 to the more average Americans that are only able to give in small amounts under \$200. The expansion began in the 2004 presidential bid with the Democratic primary race and the early frontrunner, former Governor Howard Dean. During this past 2008 presidential cycle, Barack Obama's campaign was able to implement similar fundraising strategies through the Internet and tapped the underutilized resource of small donors with the startup of a grassroots movement. By effectively doing this in addition to using the traditional donor class, the success of the Obama campaign has demonstrated the expanded donor class that now has come into being because of the Internet. As a result of the expanding donor class, political participation and involvement is on the rise. This includes not only voting behavior but also increased political activism and participation on an individual level. Involvement in politics and campaigning at a local level as well as using the Internet as a resource for blogging, accessing information, and sharing information is a symptom of this increased participation and involvement. Overall, the Internet has enormously benefited the expansion of political knowledge and involvement. It has been a key resource for the success of the Obama campaign with regard to the new donor class and political activism.

22. Will Big Box Stores Last in the Big City? An Analysis of Local Governments and Urban Opposition, *Tate Bennett, Government*
Mentors: David Moore and William Garriott, Government

Due to the revolution of the big-box retail industry, Wal-Mart and other box firms have become prominent political actors in both domestic and global realms. Realizing the importance of local politics, the retail chains have kept their frugal dispositions strong and contributions generous. However, while the firm has traditionally overridden or avoided opposition, there have been recent instances where Wal-Mart and other big box stores have faced rejection, particularly in California. Such defeats are highly publicized and tend to be centralized in urban areas. The Inglewood and Turlock victories in California set a precedent for other urban battles against big-box stores. Focusing the study on Wal-Mart, big-box stores have traditionally utilized their power and influence to shape local, state, and national policies; however, as box-stores extend in location, such political influence becomes threatened by community coalitions and their ground-up strategies in urban cities. Taking the present economic and political climate into account, the analysis concludes with a proposed outlook for the future concerning the big-box expansion and urban opposition.

23. The Catholic Vote in the 2004 and 2008 Elections: Changing Alliances Over Time, *Emily Gallt, Government*
Mentor: William Garriott, Government

This paper explores the possibility that the Catholic voting cohort is in the midst of a political identity crisis as it battles with ambiguous doctrine and teachings in politics. This identity crisis can either be explained by conflicting teachings in the Catholic Church or by conflicting contexts of elections from year to year. By examining trends in Catholic voting, behavior, and religiosity, I demonstrate that Catholic voters can switch political parties and still remain true to their Catholicism. Religion influences Catholic voters when an election is centered around moral issues, but can also be used to justify a vote when economic issues are paramount.

24. Occupational Hazards: A Study of the U.S. Occupations of Germany, Japan and Iraq, *Kate Anderson, International Studies*
Mentor: Lori Hartmann-Mahmud, International Studies

Statements professed by members of the Bush Administration indicate that the administration, at least publicly, drew upon the experience of the occupations of Germany and Japan after World War II as models for the current occupation of Iraq. This paper attempts to create a model comprised of six lessons drawn from the American occupations in Germany and Japan and to analyze whether this model has been applied in the occupation of Iraq. Ultimately, this paper finds that the only lesson drawn from the German and Japanese occupations that has been applied to the Iraq occupation is the magnitude of commitment for the Iraq occupation, which in some cases exceeds that of post-World War II Germany and Japan. However, other lessons remain unimplemented. This suggests that the Bush Administration's references to the German and Japanese experiences when discussing Iraqi occupational affairs are inaccurate.

25. Lies, Damn Lies, and Voir Dire, *Katt McGinley, Psychology*
Mentor: Mykol Hamilton, Psychology

We explored the role of social desirability, question wording, and setting in prospective jurors' opinions of a defendant's guilt or innocence in highly publicized criminal cases. Based on experimental manipulation of wording in a recent change of venue survey performed by the authors, and on trial research, we found that traditional change of venue surveys tend to underestimate the percentage of people who have formed a "guilty" opinion and that voir dire tends to underestimate the percentage even more.

26. The Impact of Family on the Self-Esteem of Mental Patients, *Nina Marijanovic, Psychology*
Mentor: KatieAnn Skogsberg, Psychobiology

This qualitative research was conducted during CentreTerm 2009 at Ephraim McDowell Regional Medical Center. It explores the impact the family can have on the recovery and self esteem of the patient. Rejection of the illness diagnosis by the family can result in poorer recovery for the patient as well as strained relations between the patient and the family. When such a conflict exists, it places an additional burden on the patient to rationalize their family's expectations of them and creates additional stress by having the patient focus on getting better in a short amount of time.

27. Gaining Knowledge in the Field of Dentistry and Its Business Demands with Specific Emphasis on Oral Surgery, *Shelby Schuttera, Psychobiology*
Mentor: Ed Montgomery, Physics and Chemistry

For my Centre Term internship, I observed Dr. Bostick and Dr. Adkins in their office in Danville, interacting with their patients and performing dental procedures. The objectives of my internship at the dental practice were to engage in day-to-day hands on experience including interaction with patients, learning what it takes to run a successful dental practice and gain knowledge on the business of a dental practice and to learn how everything fits together (insurance, profit, patient care). I learned to read x-rays, how to assist in dental procedures, and the work of different specialists. I feel that this internship has increased my motivation and desire to become a successful dentist one day.

28. Damage from Alcohol after Two Days, *Carey Shaner, Ayumi Deeny (University of Kentucky), and Kim Nixon (University of Kentucky), Psychobiology*
Mentor: Melissa Burns-Cusato, Psychobiology

Alcohol Use Disorders (AUD), commonly known as alcoholism, affect 8.5% of the U.S. population. AUDs result in cognitive deficits that are likely related to impairments in brain physiology, structure and function (Sullivan et al., 2005). Both glia and neurons are affected differently after a binge. Glia appear to be more susceptible to damage in the hippocampal region (Miguel-Hidalgo et al., 2000). Nestin and GFAP stains show reactive gliosis in the hippocampus and perirhinal cortex. Reactive gliosis is defined as increases of new glia and glial markers (Crews and Nixon, submitted). This effect relates to decreased performances in memory, visiospatial abilities and multi-tasking behaviors. Nestin, an intermediate filament protein, is expressed widely during development, but is restricted to multipotent neural precursors in adult neurogenic regions such as the hippocampal subgranular zone (SGZ) in normal, healthy brains. Nestin expression is re-instated following CNS insult and is increased especially in reactive astrocytes. Binge ethanol (EtOH) exposure in adult rats insults the CNS by producing cell death in perirhinal, entorhinal and piriform cortices as well as the ventral portion of the hippocampal dentate gyrus (Obernier et al., 2002). The presence of reactive glia is evident after damage. Our recent work has shown that a 4-day binge results in gliosis in many more regions of the brain than observed with cell death markers. Since it is not known how little alcohol, or if there is an existing threshold, to produce neurotoxicity, we investigated a 2-day binge model.

29. Sadat: The Agent of Desperate Internal Logic, *Sami Jiryis Sweis, History*
Mentor: Amos Tubb, History

Last October marked the 30th anniversary of the Camp David Peace Accords where Former President Jimmy Carter mediated a Framework for Peace between Egyptian President Anwar el-Sadat and Israeli Prime Minister Menachem Begin. Middle East observers and even Carter himself have trumpeted the Accords as a foreign policy miracle. Though Carter receives the most accolades for his role, international commentators at the time singled out the events at Camp David as Sadat's bold gamble. By examining the major events in Egypt between 1971 and 1978, this presentation aims to illuminate Sadat's role in bringing the parties together and to shed light on the Egyptian response to the Peace Accords.

30. Pocketbook Patriotism: The Intersection of Country Music and Politics in the Aftermath of the September 11th Terrorist Attacks, *Joseph Glenn McGill, History*
Mentor: Amos Tubb, History

Music and politics have long been connected. People rely on music to act as a medium through which political events can be explained. In a sense, it allows them to simplify and thus interpret the meaning of complex events. September 11th fundamentally changed the global political landscape, and by doing so, inexorably altered the prism through which listeners interpreted and consumed popular music, especially country music. This paper will examine how the intersection of music and politics provided Americans with a satisfactory, albeit vastly oversimplified, schema through which to interpret the many complexities of the September 11th terrorist attacks. This paper will use three country songs and one country music scandal to trace how the trajectory of the genre reflects American sentiments in the aftermath of 9/11. By doing so, it will acquaint the audience with a strikingly new brand of American patriotism that substitutes personal investment for pop-cultural consumerism.

31. A Town That Turned Their Backs in the Face of Murder, *Erica Sanchez, Spanish*
Mentor: Nuria Sabaté-Llobera, Spanish

This work entails a comparative analysis of the literary work *Chronicle of a Death Foretold* by Gabriel Garcia Marquez and the murder case of Catherine Kitty Genovese. My work examines the psychological phenomena known as the Bystander Effect in both the real and literary world. For my investigation I used police and witness accounts of the murder case and overlapped them with small scenes/excerpts from the book. The comparison with a real case murder in the United States and a murder in a Colombian novel allows one to conclude that the indifference transcends national and literary boundaries.

32. Barn Again: The Renewal and Reuse of American Barns, *Kathy Martinolich, Art History*
Mentor: Cristina Carbone, Art History

An integral part of environmentally conscious construction and building techniques is the recycling of existing structures. Known as adaptive reuse, this form of green construction involves the resurrection and renovation of an existing, usually abandoned or decrepit building into an active, relevant structure. This not only creates new spaces, but also helps maintain the historic identity of a place by preserving historic buildings. This paper will focus on the adaptive reuse of an important piece of American regional architecture, the barn. The openness of barns' essential plans leads to a variety of adaptive interpretations, from libraries to living rooms. In addition to individual case studies, this paper will also examine differing philosophies of renovation and reuse, and ultimately address why recycling historic structures in a contemporary and relevant manner while still remaining true to the identity of the building is vitally important to the architectural and cultural vitality of a region.

33. "Circle of Seven" and "Untamable Sky", *Corwyn Wyatt, Music*
Mentor: Larry Bitensky, Music

"Circle of Seven" and "Untamable Sky" are two musical compositions that I composed last Fall term as part of my first semester of composition lessons with Professor Bitensky. The former I set for string orchestra, but it could also be played easily by a string quartet plus contrabass. The inspiration for this piece came out of modal folk music, which does not follow our accustomed major or minor scales. I came up with an original scale for this piece, and every pitch is drawn from that scale. The second piece, "Untamable Sky," was written for flute choir. It was inspired by postminimalism and makes use of repeated melodic patterns set against one another in a complex juxtaposition of rhythms. Both pieces will be performed by Centre ensembles this semester.

34. Gilded Smile, *Zara Horton-Thomas, Music*
Mentor: Larry Bitensky, Music

The piece I would like to submit to the Rice symposium is a piece I wrote last semester called Gilded Smile. It's a duet between an alto singer and violin. It is written in a loose syncopated style largely influenced by the Appalachian music I've heard since coming to Kentucky and also Irish ballads. The piece is about a woman whose husband was lost in a coal mining accident. While the song is not specific to any one mining accident it is loosely based on records of men who died in coal mining accidents. I noticed that one of the most common names was John so the husband shares that name. The piece follows a chorus verse chorus verse bridge chorus pattern. This is my first piece written in this form and reflects the simple song nature I was aiming for. This will be a recorded piece.

35. Modern Arrangements of Traditional Music, *Clayton Carden, Music*
Mentor: Larry Bitensky, Music

I will present a short recording of some original compositions I have done which explore different ways of arranging traditional-inspired music and instruments in combination with synthesizer.

36. Three Pages, *Paul Adams, Music*
Mentor: Larry Bitensky, Music

This piece was written with the purpose of helping others understand the process of composing music. It was created for a music theory final, and much of the inspiration comes from the struggles I had writing this piece. The piece begins with an upbeat melody, one of the first musical ideas that came to my head while composing. This upbeat section is meant to represent the ignorant optimism with which a composer enters into a project like this. At the end of the first section, however, the composer realizes what he has gotten himself into and, in the second section, is horrified by the monstrous task ahead. Once he makes it through the rough process of starting to compose, the music begins to flow out of him more naturally and builds up until then end the final section, when he is surprised by the beautiful piece he has just written.

37. Reminiscence and Untitled, *Kelsey Lownds, Music*
Mentor: Larry Bitensky, Music

I would be presenting two original compositions. The first, titled Reminiscence, is an all piano piece. The second is entitled Her Song and is a vocal and piano piece. Reminiscence is a song I wrote for people to reflect on events in their lives and then personally for me to remember the close friendships that I have. Her Song was written describing an event that greatly affected me in the past. It is the story of a girl getting over something that was holding her down. I have both songs recorded but will be looking for someone to perform them live or possibly myself.

38. Importance of Lay Beliefs to Illness Behavior: A Cross-cultural Examination, *Becca Todd, Anthropology*

This paper discusses the importance of lay beliefs to illness behavior cross-culturally. Examples from different cultures around the world are discussed. Lay beliefs play an important role in determining the differences between sickness and illness and how one is supposed to act in response to these concepts. Different cultures have different views of illness and different ways of reacting to diseases. I argue that lay beliefs should not be ignored, but rather incorporated into the current Western biomedical model in order to address health issues more fully and more efficiently. Also, even in the cultures where the biomedical model is present it is important to understand why these cultures turn to their lay beliefs in times of illness in order to further our understanding of medicine and how to treat diseases.

39. Pretty: Celebrating Culture through the Costume of the Mardi Gras Indians, *Erin Menard, Art History*
Mentor: Cristina Carbone, Art History

I have explored the origins of masking Indian at Mardi Gras as well as the cultural significance reflected in post 1880's masking. Mardi Gras has been celebrated in New Orleans since the French Colonial period of the mid 18th century. While New Orleans Whites paraded as Roman gods, African-Americans passed among them disguised as American-Indians. This practice was later outlawed in the city because of violent meetings between tribes. It was not until Buffalo Bill Cody's Wild West Show came to town in 1884, that the Afro-Americans took up the tradition of masking once again. Today's Indians, who are among New Orleans' poorest, celebrate Mardi Gras by donning expensive hand-made suits which simultaneously evoke African, Native American, and Afro-Creole cultures and traditions. The once aggressive meetings between tribes are now a display of dance and chants. Now the winning tribe is the one whose chief has the prettiest suit.

40. Honduras and the Garifuna People the Coast, *Erica Sanchez, Spanish*
Mentor: Phyllis Bellver, Spanish

My paper examines the cultural and linguistic aspects of the Garifuna people in the country of Honduras. Key factors in pursuing this topic include my personal experience having lived in Honduras when I was younger and the investigation of the linguistic similarities and differences of Garifuna versus the Spanish language, for example the use of the masculine and feminine forms. This paper focuses on various aspects of the Garifuna people such as their historical background, their language and its morphology, and their way of life. At the end of my research, I was able to conclude that Garifuna arrived to Honduras via slavery and that, although the language is becoming extinct, the Garifuna people are now taking huge steps in trying to preserve what is left of their culture and pass it on to future generations.

41. Culture of Violence Against Women, *Alison Denbow, Emily Ferguson, and Camille Perez, Anthropology*

Mentors: Andrea Abrams and Phyllis Passariello, Anthropology and Gender Studies

In our research project we are doing a cross-cultural examination of women's experiences of violence with an emphasis on sex trafficking, domestic violence, and rape and sexual violence. We want to get a better understanding of the different forms of violence, gender nature of violence, cultural aspects of and variations of violence against women, specifically focusing on violence within the home or domestic violence. By taking a deeper look into socially constructed ideas of the role of women and the agency provided for them, we plan to uncover the underlying issues and causes of these unfortunate situations. The study will look how life history events and gender roles within our American society, and cross culturally, have constructed violence against and towards women. It will also be an important aspect to see how these repercussions are pushed onto the children of these women, and the ultimate consequence of this on society. This study will help to contribute to a better understanding of how identities are formed and how much of an influence society's opinions as a whole oppress people, not just in the violence of women but, in a more broader context, society.

42. Agua Pura, Pura Vida: A Project of the Centro Marista de Desarrollo to Bring Pure Water to Emiliano Zapata Sur, *Melissa Raley, Spanish*
Mentor: Phyllis Bellver, Spanish

One of the greatest problems of our day is the fact that many communities around the world do not have access to safe, affordable drinking water. During Centre Term 2009 I completed an internship for the Centro Marista de Desarrollo (Marist Development Center) in Merida, Mexico, which helped alleviate this problem in Emiliano Zapata Sur, a disadvantaged community on the south side of the city. Before I left for Merida, I was trained how to use and install the New Life International Water Purifier, which I brought with me to the internship site. My duties were to oversee the preparations for the installation of the purifier in Emiliano Zapata Sur, help develop a plan for distributing the water, and train some leaders in the community how to use and care for the purifier. Now the residents of Zapata have access to water that is both safe to drink and affordable.

43. El español en las Islas Filipinas, *Jeff Hortillosa, Spanish*
Mentor: Phyllis Bellver, Spanish

Written in April of 2008 for Spanish 390: Linguistics. A research paper examining the use of the Spanish language in the Philippine islands. The author drew upon a variety of sources including books, video, the internet, and his own family to identify the grammatical, lexical, and phonetic characteristics of the Philippine's pidgin Spanish and integration with Tagalog. Paper presented in Spanish.

44. Los Idiomas de la Isla de Roatan, Honduras, *Amanda Rapone, Spanish*
Mentor: Phyllis Bellver, Spanish

This paper explores the unique linguistic situation I encountered during a visit to Roatan, a small island off the coast of Honduras. Through my research I found that the island's history offers a great insight as to why the majority of the island's inhabitants are fluent in three languages. However, due to the convenience of both Spanish and English in the everyday lives of the people, their native Garifuna is slowly beginning to fade out of use. There is concern that this language may soon be added to the list of languages that have already become extinct.

45. A Sociolinguistic Look at Argentina, *Michael Henry, Spanish*
Mentor: Phyllis Bellver, Spanish

This is a study of several principal dialects of Argentinean Spanish and how they came to be. The paper relates immigration patterns and their effects on Spanish spoken in large cities. It also looks at the impacts of some indigenous languages on linguistics in Argentina. The presentation includes information from the ethnography database and a host of other sources as well as videos of Argentineans speaking. The presentation will be in Spanish.

46. Master of the Infinite, *Laura Hensch, Mathematics*
Mentor: Alex McAllister, Mathematics

The things I want to express are so beautiful and pure. M.C. Escher was a graphic artist who blended the branches of math and art into breathtaking masterpieces. His works can be roughly organized into three categories, each unusual and fascinating. The "endless cycle prints" utilize rhythm, periodicity, and

perpetual motion in creating impossible worlds. These works depict the profound concept of infinity as inconceivable closed circuits are traced. Escher's "regular divisions of the plane" illuminate another facet of the concept of infinity. Even his most rudimentary tessellations are intriguing. Lastly, Escher's "limit prints" seek to embody the essence of infinity by integrating all of his past techniques in a single plane. Escher was captivated by the infinite and his passion spilled into his works, as mathematically sound concepts enhance their aesthetic beauty.

47. An Overview of Ordinal Arithmetic, *Christopher Robinson, Mathematics and Physics*
Mentor: Alex McAllister, Mathematics

Ordinals are important mathematical objects which, under axiomatic set theory, shed light on fundamental elements of mathematics. We define ordinals, discuss some of their basic properties, and describe the arithmetic of ordinals, including addition, multiplication, and exponentiation.

48. Measuring User Experience in Large Simulated Networks, Like the Internet, *Brittany Devine and Kevin Mills (Information Technology Laboratory, National Institute of Standards and Technology), Computer Science*

Current models to compare congestion-control algorithms proposed for the future Internet only show effects of such algorithms in small-scale networks. To compare macroscopic network behavior and user experience for proposed congestion-control algorithms, NIST created a simulation model (MesoNet), which better mimics real-life, large-scale networks, like the Internet. At first, MesoNet could only compare average characteristics of routes transited in a simulated network topology. Now, to classify simulated flows, MesoNet considers a range of other, key characteristics: maximum flow capacity (e.g., 100 Mbps or 1 Gbps), flow size (e.g., web objects, documents, service packs, and movies) and congestion-control algorithm, which all affect user experience. It also captures and reports 14 statistics for flows within each 4D class. Experiments were conducted to demonstrate how the new MesoNet allows researchers to obtain a nuanced picture of user experience. Results of comparing two, proposed congestion-control algorithms under 32 simulated conditions will also be discussed.

49. Policy and Pedagogy: The Practice of Implementing Legislative Laws into Realistic Educational Procedures, *Drew M. White, Education*
Mentor: Mary Rudd, Education

I would like to present key aspects of my experiences during my current internship with the Kentucky Department of Education. This experience is a comprehensive internship designed to expose the roles and responsibilities of the Kentucky Department of Education in implementing education policy as dictated by Kentucky state law. I am achieving my academic goals by: (1) Actively participating in assigned meetings and discussions, (2) Identifying key components of curriculum, instruction, and assessment in the Social Studies Content, and (3) Observing and explaining the Department's role in developing and implementing policy. While in Frankfort, my duties have ranged from executive planning meetings with the Commissioner of Education to the revision of important state educational documents that influence the administrative decisions and teaching techniques in all Kentucky school districts. The internship also lends itself to extensive policy exposure with State Legislative lobbying and bill reviews/revisions.

50. Black Swans and the Adaptable Ontology, *Matthew Howell, Philosophy*
Mentor: Rosa Slegers, Philosophy

Nassim Taleb's book "The Black Swan" had direct reverberations throughout the world of economics and finance. More than that, it presents traditional ontological systems in philosophy with problematic "Black Swan" events. In my paper, I will address the repercussions of these dramatic and unexpected occurrences within our static systems of belief and outline an interpretation of existentialism as a method for approaching these problems.

51. Stick Man's Odyssey, *Phil Lederer, Philosophy*
Mentor: Rosa Slegers

In my Philosophy And Literature class last semester, the students were asked to write a term paper analyzing existentialist thinking in various literary works. Instead, I wrote and illustrated a comic book leading a character through Simone De Beauvoir's existential essay, *Ethics Of Ambiguity*. Beauvoir's ethics revolve around the human condition and the only absolute good that, she believes, exists in the world: freedom. How an individual utilizes his/her own freedom determines their authenticity. My comic book explores a character confronted by his own death and his resulting search for meaning. He meets different

characters that each demonstrate a different misuse of freedom, until he finally reaches Behaviors' conclusion. I think that this stands out as a different way to present philosophical ideas to an audience. It is not that philosophy in comics is novel, but that it is not appreciated as much as it could be.

52. Seafaring in Aeneid X: Aeneas' Arrival and Turnus' Departure, *Cornelia Gordon, Classics*
Mentor: Jane Joyce

Book X is one of the Aeneid's least-examined books, but it serves a very important purpose. The book contains two significant seafaring segments, one at the beginning and one at the end, which further develop the characters of Aeneas and Turnus. The first covers Aeneas' triumphant return to Italy, the second Turnus' unplanned escape. In these two very different passages, Vergil explores different aspects of Aeneas' and Turnus' characters with natural imagery. He also uses the incidents to allude to current events, tying these segments to actual occurrences in the Augustan era and creating a complex portrait of the Trojan hero and his Rutulian nemesis.

53. A Psychological Approach to Virtue Ethics, inspired by Legally Blonde, *Adam Spangler, Philosophy*
Mentor: Rosa Slegers, Philosophy

Aristotle argues that the ultimate goal of any person is to achieve Eudaimonia, or happiness, and he claims that this can be achieved only by being a virtuous person. Virtue Ethics stems from traditional Aristotelian notions of virtue and applies them to ethical theory. In this paper, I introduce contemporary psychological theories to virtue ethics because virtue ethics is an agent-centered theory. Thus it is necessary to take into account the psyche of the virtuous agent when examining why he or she acts virtuously. I then go on to explain the contemporary field of Positive Psychology, the focus of which is positive aspects of mental health rather than the negative. By applying positive psychology to virtue ethics, I conclude that not only is the happiness that follows from virtue reinforcing for more ethical behavior, it is also necessary that a person is genuinely happy before he or she is able to act virtuously.

54. Inter-troop Dominance as Inferred by Stress Indicators of Cercopithecus Aethiops Sabaeus at the Barbados Wildlife Reserve, *Sam Royalty, Christopher J. Fleming, and Julie Crocker, Psychobiology*
Mentor: Brian Cusato, Psychobiology

Inter-troop dominance in non-human primates can be inferred by numerous behaviors. In the Barbados Wildlife Reserve, two troops of Cercopithecus aethiops sabaeus, a.k.a. Green Monkeys, have shown indicators of stress while crossing in and out of the reserve during periods of close inter-troop proximity. Our study was to determine whether troop 1 was dominant over troop 2. We hypothesized that troop 2 would have a shorter duration of crossing and that troop 2 would show more indicators of stress during crossing. Our data for duration of crossing did not support the hypothesis due to a loss in intra-troop cohesion in troop 2. The results for indicators of stress did support our hypothesis in that troop 1 showed signs of low stress while troop 2 showed signs of high stress during periods of close proximity. Our results lead us to conclude that troop 1 is dominant over troop 2.

55. Spatial Learning in a Transgenic Mouse Model for Accelerated Aging, *David Cox, Brian Saulino, and Melissa Burns-Cusato, Psychobiology*
Mentor: Melissa Burns-Cusato, Psychobiology

In the mammalian brain, neurogenesis persists through adulthood, replenishing neurons in two target areas, the dentate gyrus of the hippocampal formation and the olfactory bulb. Like all forms of cellular regeneration, however, neurogenesis eventually breaks down. Senescence related decreases in neurogenesis within these regions have been noted in a transgenic mouse model for accelerated aging (p53 +/-). This strain is currently being investigated to determine whether these age-associated decreases in neurogenesis are the impetus behind age-related cognitive deficits. Previous research has demonstrated that the dentate gyrus is one of the primary structures required for spatial learning. So it is possible that as neurogenic mechanisms deteriorate, so will the capacity to learn spatial operations. The present study is evaluating the p53 +/- model for senescence related performance shifts on a spatial learning task, the barns-maze. We hypothesize that older transgenic mice will exhibit diminished performance when compared to a control population.

56. Stress Variations in Captive Male Gorillas, *Keri Jamison, Psychobiology*
Mentor: Brent White, Psychobiology

Gorillas are social primates and prefer to be in close proximity to one another. In the wild they live in mixed

groups dominated by a silverback male, or in all male bachelor groups. Captive colonies also mimic these patterns. We hypothesized that the variation in grouping patterns would result in variations in cortisol excretion in the urine, which can be an indication of stress. Samples were collected when available and radioimmunoassays were conducted to determine cortisol levels in individual gorillas. A significant decline in cortisol was found at the time when the bachelor group was formed with 4 young males (6 and 7 years), and an older silverback male (40 years). The low cortisol level that characterized the bachelor condition was seen in each animal. This supports the conclusion that the formation of a bachelor group does not promote excess stress among the animals.

57. The Reproductive Success of Female Quail is Enhanced by Sexual Conditioning, *Emily Clare Sither, Psychobiology*
Mentor: Brian Cusato, Psychobiology

Sexual conditioning has been well-documented in male Japanese quail but relatively few studies have investigated sexual conditioning in female quail, in part because conditioned sexual behavior in female quail has been difficult to quantify. However, the lack of learning in the female quail sexual behavior system may be an artifact of which conditioned stimuli (CSs) have been used in previous studies and which conditioned responses have been measured. In the present experiment, the degree to which female quail were affected by sexual conditioning was assessed not just by measuring changes in their behavior, but also, by measuring the extent to which the conditioning procedures enhanced their fertility. Some females were presented with an auditory cue as the CS while others experienced a visual CS. The unconditioned stimulus (US) for both groups was access to a male copulation partner, and additional groups of females that experienced unpaired CS-US presentations served as controls. CS-elicited conditioned behaviors did not reliably develop in the female subjects during the conditioning trials, but those females that experienced paired presentations of their CS and US produced significantly more fertile eggs during a post test conducted ten days after the last day of conditioning. CS modality was not a factor in the conditioned fertility effect. Unlike previous reports, these results suggest that female quail are affected by sexual conditioning procedures. However, the learning that occurs in female quail is not expressed in conditioned behaviors, but in the conditioned enhancement of reproductive success.

58. An Econometric Model of the Salary Structure for Major League Baseball Pitchers, *Kyle Borders, Economics*
Mentor: Bruce K. Johnson, Economics

The purpose of this paper is to establish the qualities that baseball franchises and players use in determining the appropriate salary level. Also, this study is used to determine whether the structure of the baseball labor market has significantly changed over time. This study uses data and salaries from Major League Baseball pitchers active in the 1997 and 2007 seasons to estimate a linear regression model indicating the value of different performance and qualitative characteristics of MLB pitchers. Using various statistical techniques, this study indicates that broad structural continuity exists within the baseball labor market. Therefore, little variation exists in the determinants of pitchers' salaries over the past decade. The most important implication of this study is that it provides more perfect information for general managers, owners, players, and agents on salary negotiations.

59. An Analysis on the Impact of Time Use Variables and BMI, *Natalie McIntyre, Economics*
Mentor: Marie Petkus, Economics

Since obesity rates are strikingly different from city to city, the aim of this paper is to further explore and understand the vast differences in BMIs throughout cities and among the individual levels. Various time use and locality variables thought to affect weight are used in this paper. The large data set for this analysis was formulated by linking several sources from 2006 with the primary source being the American Time Use Survey (ATUS).

Some of the significant variables include time spent primary eating and drinking, if a person is the primary grocery shopper of the household, if the individual prepares most of the meals in the household, number of children living in the house and if an individual is part of the food stamp program. Other significant variables include the unemployment rate, exercise rate, level of education, and public transportation rate of each MSA.

60. Chamber of Commerce Internship, *Mary Kate Clodius, Economics*
Mentor: Mike Fabritius, Economics

My internship was at the Danville/Boyle County Chamber of Commerce. The Chamber of Commerce is

located on South Fourth Street in Danville, Kentucky. Its main purpose is to advance the business community in the Danville area. It does this through sponsoring events that promote the businesses, monitoring local and state government laws that can affect businesses in the Danville area, and being an active member of the Danville community. My responsibilities as an intern varied greatly. I participated in planning and researching for upcoming events that the Chamber of Commerce was hosting, like the Spring Fashion Show that showcased the clothing of local stores. Also, I put together a packet of information to give to an individual wanting to start a business. The packet included the many different things needed to start a business from the licenses and permits to the different people to contact in the Danville area.

61. Lexington Investment Company Internship (Centre Term 2009), *Jay Russell, Economics*
Mentor: Mike Fabritius, Economics

The presentation Lexington Investment Company Centre Term Internship 2009 introduces the Lexington Investment Company and the Danville office. Educational, learning, and work experiences are introduced. The 2008 Economic Report is discussed. The background of what happened consists of the late 1990s and early 2000s tech bubble. Also the stimulation of the economy through interest rates by the Fed. The stimulus subsequently added to the housing bubble, and eventually the credit crisis. Banks were the main focus of the economic collapse. The collapse was encouraged by the highly leveraged banks and financial institutions. It is important to use this information appropriately in client interactions. Client relationships are concentrated on trust, communication and long term strategy. Exploring the economic crisis, determining the causes and reacting to the information is the end result of the economic report.

62. Our Divorce Culture, *Scott Meltzer, Sociology*
Mentor: Sarah Goodrum, Sociology

Each year in the U.S. at least one million children endure the physical separation of their immediate family by a divorce (Marquardt 2005). Twenty-five percent of people between the ages of eighteen and forty-four have divorced parents (Wallerstein et al. 2000). Comparative studies of children from divorced and intact families consistently find that children of divorce have more short- and long-term psychological and social issues than children from intact marriages. This has led to the need for an evaluation of our divorce culture, particularly since the enactment of no-fault divorce. The purpose of this research is to analyze the general population's attitudes on divorce involving children by religiosity and level of education to see if public opinion of divorce is corresponding to the reality of its effects on children.

63. The Affect of Pre-Marital Cohabitation and Level of Religiosity on Divorce, *Sarah Hargis, Sociology*
Mentor: Sarah Goodrum, Sociology

This paper examines which is the best predictor of divorce: cohabitation before marriage or level of religiosity? In a society that has an increasing divorce rate yet the majority desire to have a long-lasting marriage, this study aids the effort to better inform individuals of the factors that most affect divorce. I used data from the General Social Survey. The GSS is an annual cross-sectional survey of a representative sample of non-institutionalized adults in the U.S conducted by the National Opinion Research Council. My findings showed that there is positive, significant correlation between the likelihood of divorce and the likelihood of cohabitation. They also showed that there is a negative correlation between likelihood of divorce and level of religiosity, however it is not significant. Based on my findings I'd like to see a future revision in how GSS conceptualizes the level of religiosity.

64. Associations Between Years Served in the Armed Forces and Attitudes Towards Family Life, *Rachel Byrd, Sociology*
Mentor: Sarah Goodrum, Sociology

A statistical analysis, using data collected by the General Social Survey, of the relationship of years served in the armed forces and the importance of being married, and the relationship between years in the armed forces and the importance of having children. The findings of Thornton, Ruggles and Call et al, were used in the analysis of this paper. Little to no research has been previously done on the armed services personnel and attitudes towards family life. An initial look into the personal lives and values of Americans ages eighteen and over who are or have been employed by the United States Armed Services. Can years in the Armed Forces affect attitudes and values of men and women on the issues of marriage and children?

65. The Role of Peer Relationships on Juvenile Delinquency, *Jasma D. Mendez, Sociology*
Mentor: Sarah Goodrum, Sociology

This study will focus on the impact of peers on adolescent behavior. Warr (2002) argues that peer relationships play a major role in the likelihood of delinquency, but most research on delinquency focuses on the role of family structure and socioeconomic status in predicting delinquency. Aside from a general understanding of peer pressure, we know little about the ways that peers influence adolescent behavior. This study will examine peer interactions to better understand the types of social interactions that may lead adolescents to engage in delinquent behavior. The data will be collected in two ways: (1) through participant observation of adolescents' interaction and (2) through open-ended in-depth interviews with 5 adult individuals working with adolescents in various fields.

66. Southwest Airlines: Aircraft Demand and Learning about the Business, *Helena Josic, Financial Economics*
Mentor: Marie Petkus, Economics

This summer I interned at Southwest Airlines at their headquarters in Dallas, Texas. I was the Material Planning Intern in the Maintenance department of the company, which strictly deals with aircraft. The department is responsible for forecasting the need of airplane parts for the 10 maintenance lines across the country. Basically, they make sure that every nut and bolt a plane might need is available to each line that does mechanical work on the plane. During my time there, I worked on monthly planner effectiveness graphs, changing Philadelphia's line, changing the allocation at various stations, creating numerous visuals for things like number of hours each station has to work on a plane, and updating one of the main communication systems. While I was there I also met former president Colleen Barrett and founder, former chairman and former CEO, Herb Kelleher.

67. Practice of Entrepreneurship, *My Vu Thuy Vo, Financial Economics*
Mentor: Bruce K. Johnson, Economics

According to a careful research, average time spent cruising for a parking space in urban public parking areas varies from 3.5 to 12 minutes, with distance traveled ranging from a half mile to over a mile. Not surprisingly, in any shopping center in a big city, it is always easy to see frustrated drivers looking for parking slots. My project, which is the coursework of Practice of Entrepreneurship class, proposes a new business idea of providing a smart system to help car park operators achieve efficient parking management. Through this project, I have gained an understanding of the nuts and bolts of business start up and improved my entrepreneurial capabilities. I believe that whether I go on to work for myself, a company, a multinational enterprise or even in the public and social sector, entrepreneurial skills are always pertinent to my future success.

68. Corporate Finance Internship, *Chris Conkright, Economics*
Mentor: Mike Fabritius, Economics

My internship for Centre Term took place at Gulfstream Enterprises in Owensboro, Kentucky. Gulfstream Enterprises consists of over 26 separate partnerships and Limited Liability Companies (LLCs). Gulfstream Commercial Services, their biggest development company, is a full service commercial brokerage firm specializing in tenant representation, acquisition, development, build to suit, management and leasing throughout Kentucky, Indiana, and Illinois. Gulfstream currently has one multimillion-dollar development under way, which includes a US Bank mortgage center, which will bring 350 new jobs to Owensboro. Gulfstream recently paid \$4.5 million for a 150 acre tract of land, for a planned \$250 million development. My responsibilities included allocating payroll expenses to several cost classes, updating depreciation schedules, converting balance sheets from accrual to cash basis for tax purposes, balancing intercompany records, and updating depreciation schedules.

69. Northwestern Mutual Internship Experience, *J.C. Spalding, Economics*
Mentor: Mike Fabritius, Economics

My internship with Northwestern Mutual was a great experience. It has been voted a Top ten internship for 13 straight years by Vault Magazine. It was named five best internships by cnmmoney.com. Northwestern Mutual has also been hailed as one of the fifty best companies to sell for by Selling Power Magazine. The internship is a great opportunity to establish a career. It is my job to learn about the accomplishments and understand the dreams of the prospect, as well as identify the challenges and seek out the gaps in his or her financial plan. Through this process, I can help the prospect develop a strategy that brings them as close as possible to the fulfillment of their ultimate financial goals. What can Northwestern Mutual do for you?

70. Chamber of Commerce Internship, *Whitney Davis, Economics*

Mentor: Mike Fabritius, Economics

This presentation will give an overview of my internship experience at Danville-Boyle County Chamber of Commerce during Centre Term. My time spent there was an essential part of increasing my experience in the professional community and developing relations with professional co-workers and the business community members. This presentation will touch on some of the responsibilities of being an intern at the Chamber, my growth during the internship, and how I am using the experience to develop a future career.

71. The Amir Sound, *Seth Amir, Music*
Mentor: Larry Bitensky, Music

Inspired by Jazz musicians of the 20th century, I have put together several songs while learning the finer points of jazz harmony. While much of this material is cerebral in its usage of music theory to form neat ideas and break conventional rules, it is aimed to please nonetheless. The goal of publicly presenting this material is to demonstrate the art of composition and present a personal collection of written songs. (The presentation would be the listening and explanation of the written songs)

72. From Stable to Table: The Future of Farming in Our Old Kentucky Home, *Kari Walker, Rachel Skaggs, Michael Keach, Josh Blair, and Sergio Palleroni (University of Oregon-Portland), Humanities*
Mentor: Mary Gulley, Psychology

This documentary attempts to shed light into the world of organic and local farming in Kentucky. The Kentucky farm, a longtime tradition of the state, faces the dire need to adapt to the modernized world. With the number of factory farms increasing daily and environmental consciousness greater than ever, the local family farm is finding new and innovative ways to become smarter, greener and more efficient. Our findings focus on the importance of having local food economies. Consequently our documentary embraces the ways that we can begin to move forward with the process of environmentally friendly farming and food consumption.

73. Sister, *Landon Berry, Creative Writing*
Mentor: Daniel Smith, English

"Sister" is a work of short fiction, written for Daniel Smith's Creative Writing 145 class. The focus of the story is the use of an evolving symbol, in this case, a locket. Every use of the locket has a different meaning and a different implication for the characters involved. "Sister" revolves around two fraternal twins and their inappropriate relationship with their dad. Warning: this story contains adult subject matter. However, it is written and presented in a manner that is both mature and non-explicit. Sister takes a deep look into the psyche behind a dysfunctional family, as well as the pains taken by a daughter who yearns for the attention that she has been denied all her life.

74. As You Like It, *Cameron Comstock, Kayt, Bentley, William P. Burgess, Katt McGinley, Dana Smith, and Stuart White, English*
Mentor: Philip White, English

This production came out of an assignment given us by Dr. White. Students in his Shakespeare class were assigned short essays on the plays we had read but also had the option to give a dramatic interpretation of a scene. Two of the groups got together and asked if we could do our dramatic interpretation as a film. Dr. White had never been presented with this idea and happily agreed, so off we went.

75. BRAINS, *Jeff Hortillosa, Creative Writing*
Mentor: Daniel Smith, English

A satirical short story that examines politics, the media, celebrity, and social margins through the scope of modern b-grade science fiction. Written in February 2009 for Creative Writing 245.

ABSTRACTS: POSTER PRESENTATIONS

76. Backyard Archaeology: A Preliminary Survey of the Salt River Site, *Evan Kutzler, Anthropology*
Mentor: John Tomasic, Anthropology

Danville promotes itself as the city of firsts, yet its founding citizens cannot claim to be the region's first inhabitants. This preliminary archaeological survey will investigate a site, possibly as old as 7,000 BCE, a few miles outside Danville. A poster display will report findings by Dr. Tomasic's Ancient Civilizations Class on the distribution of artifacts within a test site. Using a Trimble GPS unit, surface artifacts will be plotted on a map of a resident's property. Artifacts previously collected by the resident will be photographed and identified in order to speculate on the age and potential cultural value of the local site.

77. Internship at The Great American Dollhouse Museum, *Chris Baumann and Lori Kagan-Moore (The Great American Dollhouse Museum), History, Anthropology and Sociology, and Museum Studies*
Mentor: Clarence Wyatt, History

This work analyzes my experience as an intern at The Great American Dollhouse Museum located at 344 Swope Avenue, Danville, KY 40422. My internship is made up of three major facets: historical research and reports, marketing, and curatorial activities. The historical research and reports cover distinct topics that are portrayed in the exhibits at the museum. Topics include the U.S. Mexico border, the American Westward Movement, Native Americans, and early and late immigration to the United States. My marketing responsibilities involve event planning, networking, and journalism. Lastly, my curatorial activities consist of display development, incorporating painting, decorating, and signing. As a history and anthropology/sociology double major, interning at this museum has been both beneficial and very enjoyable.

78. Detoxifying Footpads, *Sarah Couch, Biochemistry and Molecular Biology*
Mentor: Stephanie Dew, Biology

Detoxifying footpads promise the removal of toxins through the bottom of your feet to provide increased energy, improved quality of sleep, and overall improvement of the clarity of your skin. Forty-two individuals were asked to wear the footpads for one week and fill out a pre and post survey to determine a baseline and the level of improvement respectively. The 42 subjects were divided into three groups; two of the groups tested actual footpads, the third wore generic band-aids for a control. The post surveys were compared to pre surveys on the basis of the individuals perception of how well they worked, whether there was an improvement in the individuals pain levels, and whether their overall skin clarity improved. In all areas of comparison, the p-value between groups was well above 0.05 indicating there was no therapeutic relief as promised by the footpad companies based on consumer use and perception.

79. Retinol Esterification in the Hepatopancreas of the Crayfish (*Procambarus clarkii*), *Becky Lindhorst, Bryan Fioret, Chase Palisch, Anna Canelas, and Stephanie Dew, Biochemistry and Molecular Biology*
Mentor: Stephanie Dew, Biology

Vitamin A (retinol) is a necessary nutrient for all higher animals, including many invertebrates which use it as their visual chromophore. All of these animals must get vitamin A in their diet and must be able not only to transport this hydrophobic vitamin to target cells but must also convert it into active forms of the vitamin, such as retinal and retinoic acid. In mammals, retinol is converted into retinyl esters for export from the small intestine, for storage in the liver, and as part of the visual cycle. Little is known about these processes in invertebrates. Mammals have two enzymes that can catalyze the conversion of retinol to retinyl-esters: lecithin:retinol acyltransferase (LRAT) and acyl-coA:retinol acyltransferase (ARAT). LRAT is the physiologically important one in mammals. We have identified an ARAT activity in microsomes from the hepatopancrease of the freshwater crayfish, *Procambarus clarkii*. We were unable to detect any LRAT activity, suggesting crayfish only have one enzyme that can catalyze this reaction. This activity shows a linear dependence on time and microsome concentration. It shows temperature dependence and an optimal pH of 6.5. We have characterized its acyl-CoA preference and determined K_m and V_{max} for both retinol and the acyl-CoA.

80. Host-finding Sensory Mechanisms of Gnathiid Isopoda, *Benjamin Tuttle and Eric Brown, Biology*
Mentor: Paul Sikkell, Biology

Despite the vast research in parasite ecology of reef habitats, virtually nothing is known of the sensory mechanisms involved in marine parasite host detection. This study examines the mechanisms used by

Gnathiid isopods (Crustacea) to locate hosts in the field during time periods of peak activity (nocturnal and crepuscular). Conducted throughout the summer of 2009 in Big Fisherman Cove, St. John, USVI, this experiment consisted of four treatments, each using traps made of modified 20 cm diameter x 35 cm long PVC Ts. Treatments included: 1) olfactory and visual cues from a fish; 2) visual cues alone; 3) rock control; and 4) empty control. An analysis of the resulting data by means of post-hoc pairwise comparisons (Tukey test) showed that the vision-olfaction traps that had gnathiids had significantly more than each of the other three treatments, which did not differ from each other ($p > 0.99$).

81. An Investigative Report: Water Quality in Clarks Run-American Greetings, *Sarah Wilson, Jacquie Kalugyer, and Emily Hogancamp, Biology*
Mentor: Chris Barton, Biology

Clarks Run is a historically impacted stream that runs through Danville, KY. Runoffs from agriculture and storm drains contributed its low water quality. Conservation efforts by CREEC should improve the impacted status of this river. We collected macroinvertebrates using kick seine, rock pick, and D-net sampling methods in Clarks Run at the American Greetings site. All collected biota were identified to family and data were analyzed by EPT. Data collected in January 2009 were compared with analogous data collected in January 2007. The EPT Taxa Richness Index shows that the biota of American Greetings has become more intolerant of pollution when compared to the EPT Taxa Richness Index of 2007. Furthermore, the concentration of phosphates and water turbidity has lessened within the past 2 years in the Clarks Run watershed. According to this research, the 2009 data are indicative of better water quality compared to that of 2007.

82. Molecular Genetic Study of Isolation Populations of the Northern Studfish (*Fundulus Catenatus*) Living in Four Watersheds in Central Kentucky, *Meredith Angel and Philip Crain, Biology*
Mentor: Chris Barton, Biology

Molecular genetics provides biologists with tools for characterizing species based on heritable variations in population gene pools. Our study used these techniques to examine four isolated populations of the Northern Studfish, *Fundulus catenatus*, common inhabitants of headwater streams in east-central North America. Studfish samples were collected from high-gradient streams in central Kentucky associated with Green River, Salt River, Kentucky River, and Cumberland River drainages. These watersheds have allowed the spread and subsequent isolation of populations, promising the possibility of molecular evolution. DNA was isolated from the fins and amplified via PCR using two distinctive sets of primers unique to the control region of mtDNA. The sequences extracted showed no variation either within or between the four populations. Further examination of the species will concentrate heavily on modifying other previously failed primers and adding a fifth site that is located in the same watershed as one of the original four.

83. Genetic Divergence among Populations of Bahamian Pupfish *Cyprinodon Variegatus*, *Blair Murphy, Biology*
Mentor: Chris Barton, Biology

This study focuses on a common species of pupfish, *Cyprinodon variegatus*, inhabiting environments from the Gulf coast to Massachusetts along the Atlantic. With most pupfish research focusing on isolated Western U.S. populations, few studies have looked at genetic divergence among pupfish inhabiting the Bahamian Archipelago. These eurythermal and euryhaline pupfish populate isolated, shallow inland bodies of water in the Bahamas. This prohibits them from swimming between islands and may increase their tendency toward allopatric speciation, and thus genetic divergence. The current study focuses on studying the genetic divergence among pupfish populations from Abaco, Eleuthra, Inagua and San Salvador islands. In this study, mitochondrial regions of DNA located at the ND2 and the ND4 genes were isolated and sequenced from fin samples of 28 individuals from 4 islands. Over 47 samples were compared with no genetic variation detected. Future studies will resolve these sequences and explore other gene locations.

84. Ontogenetic Shifts in Timing of Host Infestation by Parasitic Gnathiid Isopod Larvae on Caribbean Coral Reefs, *Whitney Sears and Jessica Wheeler, Biology*
Mentors: Paul Sikkel, Biology and Rob Ziemba, Biology

Ontogenetic niche shifts are characteristic of organisms with complex life cycles such as bottom-associated marine invertebrates. Research has focused primarily on changes in habitat or diet. However, ontogenetic changes can also occur in the temporal pattern of individual foraging. Due to the difficulty of identifying larval gnathiids, it is not known whether this is due to interspecific or intraspecific variation in behavior. We tested predictions of the hypothesis that this represents an ontogenetic shift in host-seeking activity. All larvae collected from a single Caribbean site from caged fish retrieved at night were third stage larvae, with most

developing into females. In contrast, approximately 80% of the gnathiids collected at dawn developed into second or third stage larvae, and nearly all of the remaining large individuals developed into males. Furthermore, comparison of ITS2 gene regions from individuals sampled during the day versus during the night revealed no differences in this highly variable region. Thus, gnathiid larvae at this site appear to shift their time of activity as they develop, and larvae developing into males remain active over a longer time period than those developing into females.

85. Factors Controlling Cell Cycle Regulation: More Shocking News from Plant Biology, *Ana Santin, Ashley Colagross, G. Curlango Rivera (University of Arizona), H. D. Van Elten (University of Arizona), and M.C. Hawes (University of Arizona), Biochemistry and Microbiology*
Mentor: Peggy Richey, Biochemistry and Microbiology

Root caps of higher plants provide a convenient model to study the eukaryotic cell cycle. The stages of the cell cycle can be synchronized nondestructively and rapidly within the root cap, where the effects of specific treatments can be monitored microscopically within several easily accessible, distinct layers. Root caps of legumes and other species are major source of metabolites that are under active study as chemotherapy agents, because these products can influence growth and development in cancer cell lines. The possibility that such natural products are present in high concentrations in the root cap because they normally control cell cycle in the plants that produce them has not yet been explored. Conversely, the root cap may have potential as a cost-effective screen for products targeting specific stages of the cell cycle implicated in human carcinogenesis. In this study, we measured the impact of transient exposure of root caps to known cell cycle regulators and prospective chemotherapy agents including endogenous plant metabolites and controlled electrical shock.

86. Spectroelectrochemical Sensors: Comparing Effects of Ionic Strength on Sensor Response in Nafion and SSEBS Films, *Carla Estridge, Chemistry*
Mentor: Keith Dunn, Chemistry

The effects of supporting electrolyte were tested on a novel sensor. The sensor takes advantage of an ion exchange film, electrolysis, and attenuated total reflectance spectroscopy to create three levels of selectiveness. The effects of ion concentration in supporting electrolyte solution were tested and compared between two films, Nafion and SSEBS.

87. Helium Atom Confined in an Impenetrable Sphere, *Chase Wilson, Chemistry*
Mentor: Ed Montgomery, Chemistry

The Schrödinger equation for a helium atom confined at the center of an impenetrable sphere was solved using a 70-term Hylleraas expansion. Variational upper bounds for the non-relativistic energy and radial correlation energy of the singlet 1S ground state were calculated over a range of confinement radii from 1 to 10 atomic units. The ground state energies were at least ten micro-hartrees lower than the best previously reported values. This work is the first calculation of accurate radial correlation energies for confined two-electron systems. The angular and radial contributions to the correlation energy were computed over the same confinement range. This data will provide a starting point for further investigation of the effects of confinement on electron correlation in two-electron atoms.

88. Biosensing with Functionalized Gold Nanotubes, *Emily Green, Chemistry*
Mentor: Jeff Fieberg, Chemistry

A nanoscale biosensor has been fabricated and used to detect nanomolar quantities of an analyte in aqueous solution. The biosensor was produced by chemically etching multiple (> 3000) conical nanotubes (pores) into an ion damage-tracked polycarbonate membrane. The nanotubes were then electrolessly plated with gold. Gold-thiol chemistry was used to functionalize the pores with biotin, a molecular recognition agent (MRA). The analyte, streptavidin (SA), which binds strongly to biotin, was sensed in multiple ways. In the first method, detection of fluorescently-tagged SA with fluorescence microscopy verified that the analytes bonded to the immobilized MRA inside the pores. The second method measured a decrease in conductance of the membrane following introduction of the analyte to a 1 M KCl solution. This conductance decrease resulted from partial clogging of the pores as analytes bonded to the functionalized nanotube. A comparison of current-voltage (I-V) curves, before and after introduction of the analyte, indicated that the average pore size shrunk by 5-7 nm, approximately the size of a SA molecule.

89. Virtual Screening - Mur Enzymes, *Jordan Feigerle, Chemistry*
Mentor: Jennifer Muzyka, Chemistry

The Mur enzymes are bacterial enzymes that are responsible for assembly of the peptidoglycan molecule. The peptidoglycan is essential for the structure of bacterial cell walls because it provides rigidity and resistance to osmotic pressure. MurA catalyzes the first step in the synthesis of the peptidoglycan and is not similar to any enzymes in the human body, making the MurA enzyme a good target for inhibition. Currently, the naturally-occurring drug fosfomycin inhibits the MurA enzyme; however, increasing resistance to fosfomycin by bacteria has increased the need for the development of more antibiotics to inhibit fosfomycin-resistant bacteria. In this research project, we have been using the visualization software Swiss PDB Viewer and the computational chemistry software programs Amber10 and Dock6. By utilizing these programs, we have been able to model possible ligands that can inhibit MurA. Later these compounds will be tested to determine whether they are effective as antibiotics.

90. Selected Centre College Building Energy Consumption, *Brian Coxon and Cody Buell, Environmental Studies*
Mentor: Preston Miles, Chemistry and Environmental Studies

The purpose of this poster is to inform the general Centre community of the energy consumption of some of the more prominent buildings on campus. Mr. Coxon gathered data from physical paper billing statements in conjunction with Cody Buell who then organized and reduced the superfluous information. The work will help both administrators and students both cut back on energy consumption and reduce running costs of the buildings on campus.

91. Déclic Délice, *Kasey Jackson, French*
Mentor: Allison Connolly, French

This project combines a study of the French language in conjunction with an exploration of French business practices. Déclic Délice is a small fictional subsidiary located in Lyon, France. This enterprise takes an artistic approach to food photography paying special attention to the cultural background of the food, textures and color. As food photography is a relatively unexplored business in France, Déclic Délice brings new ideas and practices into the realm of French photography. The enterprise uses the highly developed transportation system of France to take advantage of the range of cultures inherent in the country. This provides a range of opportunities to capture rich and distinct photographs. Since the project is based on a unique approach to photography, there is also an innate artistic and creative aspect in the project.

92. The Globe in 2050, *Greg Brooks, Emily Arbegust, Patrick Garvey, and Alex Headley, International Studies*
Mentor: Nayef Samhat, International Studies

This poster presentation examines the path of international relations into the year 2050. In the coming years the world will see a great shift in global powers. It will no longer be defined primarily by the interests of the United States, but by the perspectives of a number of rising powers. This relative decline in U.S. dominance, corresponding with the rise of the Asian states and increasing globalization, is studied through the lenses of four distinct disciplines. The studies of economics, human capital, culture, and geopolitics contribute to our findings on the evolving global landscape.

93. Our Global Future: The World in 2050, *Morgan Lynn, Abby Woerhle, and Nick Laferriere, International Studies*
Mentor: Nayef Samhat, International Studies

This project seeks to predict the organization of global power in the year 2050 based on three factors: economic, geopolitical, and economic power. The question of how these factors will intertwine and affect each other as well as global organization was also examined. The project analyzes data and trends from recent years in the hopes of identifying a possible path for the future of global power. Our findings led us to theorize that we will soon find ourselves in a multi-polar world, with five major powers dominating the rest of the globe. We expand by identifying spheres of economic, military, and political influence radiating from these core states.

94. The World in 2050, *Danielle Myers, International Studies*
Mentor: Nayef Samhat, International Studies

Will the United States be a hegemonic power in 2050? This is an important question due to its impact on this generation. It is difficult to predict the future, however political scientists have some tools to help them try and see years ahead. By looking at patterns in cultural, economics, demographics, and military spending, they are able to try and predict the status of the world order in the world in 2050. In this study, our

group examined how culture would play an increasing role on international relations, that military spending would indicate which countries would become militaristically powerful, which countries would continue to grow economically, and finally how demographics would affect economic factors. We determined that the United States would fall from its hegemonic status, and that the five BRIC countries, Brazil, Russia, India, and China would become increasingly more powerful by 2050.

95. "Foursee" the Future: An Investigation in Global Trends, *Brittany Coppola, Chris Herrmann, Colin Misbach, and Grant Sharp, International Studies*
Mentor: Nayef Samhat, International Studies

The purpose of our research project was to identify global trends and make informed judgments about how the world will look in 2050 with regard to human capital, economics, culture, and geopolitics. The data we collected came from various academic journals, the Census Bureau, Sachs and Goldman, newspaper articles, and other scholarly sources. Our methods included identifying and amplifying quantitative and qualitative data, theories, and ideas by trying to understand how global patterns interplay and may unfold in the future. Based on our findings, China and India's growth will surpass that of the West, making them the major players economically and in terms of population. Consequently, technological growth will enable them to exert more influence in global values, ideas, culture, and thus allow them to become the new hegemon of the world.

96. Mathematical Modeling of Fatty Acid Oxidation in Skeletal Muscle Cells Sheds new Light on Obesity, *Sara Haque and Kara Kruse (Oak Ridge National Lab), Mathematics*
Mentor: Anne Collins, Mathematics

ORNL, in collaboration with the Obesity Research Center at the University of Tennessee Medical Center in Knoxville, is developing a mathematical model of the biochemical cross-talk between adipose cells and skeletal muscle cells. If we can understand the complex processes that increase fatty acid oxidation, then we may be able to control some of the factors affecting obesity. The long term goal of this project is to develop a mathematical model displaying the balance between fatty acid oxidation and fatty acid synthesis in adipocytes and skeletal muscle cells. The model will examine how these processes respond to changes in relation to adiponectin, interleukin-6 (IL-6), and interleukin-15 (IL-15) which are synthesized by the adipocytes. In addition, the model will demonstrate how the syntheses of these three biochemical proteins are affected by concentrations of leucine and calcitriol which have an exogenous source.

97. Modeling 6 cm OH Maser Emission in W49, *Brice Hamilton, Physics*
Mentor: Phil Lockett, Physics

W49 is a very luminous star-forming region and is also one of the Galaxy's most intense sources of maser emission. Maser lines typically have narrow linewidths and are very intense. However, a large fraction of the maser emission in the 6 cm excited state OH lines in W49 has been observed to be weak with broad linewidths. The 6 cm emission is also more spatially extended than the typically observed point-like maser emission. These observations have yet to be explained by theoretical models. We have modeled these masers including the important effects of line overlap. We will present our preliminary results, which are in reasonable agreement with observations.

98. Alternative Uses of Tobacco, *Katya Alimova and G. Wagner (University of Kentucky), Plant and Soil Sciences*

During development, tobacco plants synthesize and accumulate on their leaves a number of substances with potential for use in cosmetics and pharmaceuticals. We sought to compare two tobacco varieties, KY-14 and KDH-960, for their production of diterpenes and phylloplanins natural chemicals useful as constituents in personal care products, and as anti-fungal agents, respectively. Organic and aqueous washes were obtained from leaves of both plant varieties over a 21 day period and analyzed via gas chromatography and SDS-gel electrophoresis. The results showed that KDH-960 produces higher levels of diterpenes, and their production increased throughout the test period. In contrast, KY-14 started producing diterpenes earlier, but production slowed and was followed by degradation. The output of phylloplanins was not drastically different between these varieties. These results suggest that KDH is a better candidate for production of both these potentially-useful natural products and that it may provide a new, alternative use for tobacco.

99. Does Prior Copulation Affect a Male Japanese Quail's Mate Preference?, *Amanda Glueck, Samantha Bottom, and Brian Cusato, Psychobiology*

Mentor: Brian Cusato, Psychobiology

Males of many bird species show clear and significant preferences in their mate choices, but the mechanisms that govern these mate choices have in the past been difficult to identify. The present experiment was designed to investigate the differing roles of female exposure length and male's copulation experience as potential mechanisms that govern the mate preferences of male Japanese quail (*Coturnix japonica*). Some males were given 24 hours of exposure to a female while other males were allowed just 5 minutes. These groups were further divided into conditions that were permitted either full or visual-only access. Full-access males were permitted to copulate with a female but the males in the limited access conditions were separated from the female by a chicken wire barrier. After the exposure phase, each male was given the option of viewing two different females during a simultaneous choice task: an unfamiliar female, or the female with which they had previous experience. The amount of time the males spent searching for and viewing each of the females during the choice task was observed and analyzed to determine the male's preference. The length of exposure to the familiar female did not affect the male's preference, but the males permitted only visual access to their familiar female spent significantly more time viewing both female types during the preference test. Subsequent analyses are planned to address the role of motivation in the formation of male mate preferences.

100. Visual-spatial Attention in Athletes and Non-athletes, *PJ Gagnon and Kyle Saylor, Psychobiology*
Mentor: KatieAnn Skogsberg, Psychobiology

Common knowledge predicts that athletes will excel in tests of visual-spatial attention due to the skill set required to be successful in most individual and team sports. Additionally, previous studies indicate that men generally outperform women on visual-spatial attention tasks. However, few studies have explored whether athletes from team sports differ from non-athletes in visual-spatial skills. Fewer still have examined the differences in abilities between male and female athletes. In this study, we will examine the group differences in visual-attention skills of both men and women who are either athletes in team sports or non-athletes. We anticipate that athletes will outperform non-athletes, while the differences between male and female athletes may exist but be less profound. This study will help elucidate whether visual attention abilities are innate or developed through experience. Additionally, this study may lead to further research to help both athletes and non-athletes improve their visual-spatial attention skills.

101. Exploring Hemisphere Differences in Language Production, *Rachel Skaggs, Psychology*
Mentor: Katherine White, Psychology

Overwhelming evidence suggests that the brain's left hemisphere plays an essential role in almost all aspects of language processing. However, recent research has attempted to define what role, if any, the right hemisphere has in language production and comprehension. This study seeks to explore the contributions of both hemispheres to the activation of syntax (i.e., a words part of speech) when producing words. Because investigations of hemispheric roles in language production are rare, the present research explores methodologies that will facilitate experimental measurement of each hemisphere's role in the production of a word's part of speech.

102. A Comparison of Attitudes Toward Body and Self Between Division I and Division III Athletes, *Rebecca Rhule, Charlotte Jones, Melissa Burns-Cusato, and Rick Grieve (Western Kentucky University), Psychology*
Mentor: Melissa Burns-Cusato, Psychology

Athletes often participate in their particular sport for various reasons. Some are intrinsically motivated by the love of the sport and the need to succeed, whereas others are motivated by extrinsic factors such as scholarships and the positive attention that comes with being an athlete. These differences in motivation to participate in sports may be reflected in the athlete's self-image. To test this hypothesis, we assessed attitudes of athletes at Division I and Division III colleges. Division I athletes experience pressure to compete due to the contract of their scholarship. Division III athletes, receive no athletic scholarships or incentives to participate in sports, instead, often engage in sports due to intrinsic motives. College students from Division I and Division III institutions completed an online survey in which they ranked satisfaction with each part of their body on the Body Assessment Scale (BAS) and agreed or disagreed with statements concerning their self-esteem on the Rosenberg Self-Esteem Scale. Results indicated Division III athletes had significantly higher body satisfaction and higher self-esteem than non-athletes. In contrast, Division I athletes had higher measures of self-esteem than non-athletes but scored similarly to non-athletes on body satisfaction.

103. Semantic and Grammatical Influences on Homophone Substitution Errors, *Tara Milburn, Emily Boyle, and Katherine White, Psychology*

Mentor: Katherine White, Psychology

The process involved in retrieving a word to use in spoken or written production includes planning the concept that one wants to communicate, choosing words that correspond to the concept, and retrieving the sounds or spellings for those words. This research used homophone substitution errors to investigate the roles of context and syntax in written production. A homophone substitution error occurs when a word is substituted with its homophone (e.g., blue over instead of blew over). Participants typed auditorily-presented sentences that included a homophone (e.g., blew) which was preceded by a contextually-inappropriate semantic associate (e.g., sky). Homophones were categorized as sharing a part of speech (e.g., both homophones are nouns) or having different parts of speech (e.g., noun, verb). Results indicated that substitution errors were influenced by both semantic context and a homophones part of speech. These results will be discussed within current theories of language production.

104. College Students' Preferences for Future Children: Sons versus Daughters, *Kelsey Snavelly and Mykol Hamilton, Psychology*

Mentor: Mykol Hamilton, Psychology

Past studies show that preference for sons over daughters has been documented in the U.S and other countries. Little research has been done on the consequences of strong son preference in the U.S., but it has been shown that married couples are more likely to divorce if they have daughters instead of sons. In our study, we examined sex preference in current American culture as well the effects it has on the children of those who exhibit a son bias. We found that a small sex bias still exists today, especially for men. We also concluded that these biases do not have a strong effect on the treatment of sons or daughters.

105. Costume Design for Dracula in Space, *Shannon Eblen, Dramatic Arts*

Mentor: Matthew Hallock, Dramatic Arts

For the spring '09 production of Dracula in Space, I designed costumes with a period feel, but based in the future. I used synthetic fabrics in a limited palette of black, red, white and silver. I will describe the process of the design and present that along with renderings, research, and photos from the actual production.

106. "The Importance of Being Earnest" Set Design, *Kristen Robinson, Dramatic Arts*

Mentor: Matthew Hallock, Dramatic Arts

The set design for the Drama Center's fall 2008 production of *The Importance of Being Earnest*. What is included is a full representation of the design from start to finish; beginning with preliminary sketches and ending with a full scale color model. The design walks a thin line between artistic metaphor and realism, which is inherent to the play in question. In *The Importance of Being Earnest* Oscar Wilde constantly explores deep human issues such as love and acceptance through the lens of Victorian social artifice. Thus the design is working to achieve a physical space that suits this dichotomy.

107. Scenic Design-Picasso at the Lapin Agile, *Mary Whitehurst, Dramatic Arts*

Mentor: Matthew Hallock, Dramatic Arts

This project revolves around the set design for the play *Picasso at the Lapin Agile*. The presentation includes research, preliminary drawings, 2 models, and drafting for the scenic design of *Picasso at the Lapin Agile*. All of these materials were made in preparation for the final implementation of the design for the production of this show in Weisiger Theater during Centre's Family Weekend. Research materials show inspiration for the design; drawings and models show the progress the design made over the course of the design process before being translated to the stage in full scale.

ABSTRACTS: ART SHOW

The Student Art Show showcases the work of 2008-09 studio art class students. Mediums represented include glass, charcoal drawing, oil painting, and ceramics. Assignments range from human figure drawings to cast glass sculpture to asymmetrical ceramic vessels.

108. Monster Water Jug, *Carol Denney, Art*
Mentor: Judith Jia, Art

I built this pot in much the same manner as the first vase, with the same tiny coils. However, as I went along I smoothed out the sides using a metal rib tool. This resulted in smooth walls that were strongly bonded together but still incredibly light. As with my first piece, I was influenced by many ancient cultures, and although we were mimicking the form of a Minoan vase for this assignment, I wanted the decorations to be distinctly modern. The two monsters are very cartoonish, and I wanted them to contrast with the archaic form of the vase. The traditional vases featured sea creatures and other monsters, so I simply gave my vase a distinctly modern flavor.

109. Tiny Coil Tall Vase, *Carol Denney, Art*
Mentor: Judith Jia, Art

I was encouraged to play with the different sizes of the coils for our project, and I was interested in how small I could make the coils and have the piece still be stable. I was intrigued by the nice texture they left and decided that I wouldn't smooth the outside. The tiny coils allowed the vase to be extremely light for its size, and they also allowed the vase to be built quickly. Because of this, I was able to make the pot much larger than I had originally intended and I think that the scale of the piece makes a nice contrast to the tiny coils it is made out of. While making this piece, I was highly influenced by ancient cultures and their pottery, so I wanted to give the pot a nice weathered look as though it had been made thousands of years ago.

110. Study of Odilon Redon's "Les Yeux Clos," *Kayley Jerrell, Art*
Mentor: Sheldon Tapley, Art

Oil on canvas. In this painting (the original created by the fantastical artist Odilon Redon), we see the bust of a strange woman rising with great tranquility above an ethereal ground. We are cut off from any sort of communication with her, as she is lost in her own inner world. Are her eyes closed in death or in dream? In either case, surely the wisdom and visions being experienced are far more real than our reality. Perhaps this painting is so intriguing partly because we wish to be with her in that seemingly unobtainable world.

111. Sit Alone in the Dark, *Kayley Jerrell, Art*
Mentor: Sheldon Tapley, Art

Charcoal on Strathmore paper. Landscape or perhaps the possibility of a portrait? There is no one sitting in the chair, but there is an invitation to do so extended to the viewer. You will only be able to wonder what would happen if you decline.

112. Will You Marry Me?, *Kayley Jerrell, Art*
Mentor: Sheldon Tapley, Art

Oil on hardboard panel. This self-portrait tells a story about a relationship, and invites a relationship with the viewer. Do you see and understand all that is being offered?

113. Haniwa Woman, *Annie Schultz, Art*

Haniwa woman is a historical replication of Japanese a Haniwa figure, completed for Ceramics I in the traditional media of earthenware clay and terra sigillata.

114. Portraits, *Ben Tuttle, Art*
Mentor: Sheldon Tapley, Art

My portraits exhibit a range of subjects from live nude studies, to skull cast studies. The compilations examine the stages of life in a series of mediums including charcoal, oil, and glass. These studies symbolize the relationship between form and function and analyze the aesthetics of the human figure.

ABSTRACTS: JOHN C. YOUNG PRESENTATIONS

115. From Mineshaft to Mountaintop: Appalachian Folk Medicine in the 21st Century, *Sarah C. Baird, Anthropology*
Mentor: Phyllis Passariello, Anthropology

A unique folk culture is synonymous with the Appalachian Region: an area of the United States built on the paradox of a rich heritage of community in combination with rampant, widespread poverty and paranoia. Nowhere do these seemingly polar opposite ideals collide more clearly than in the study of folk medicine practices within the region. Folk medicine and its usage have changed dramatically since the turn of the 21st Century. Through a native ethnographic lens, extensive bibliographic study, first-source materials, participant observation, fieldwork, survey and interview confirm that while folk medicine vernacular and jargon, family-based home remedy practice and the fusion between religion and folk medicine are still alive and well, increased medical access through local clinics, an underlying culture of illegal drug trafficking and internationalism in holistic medicinal practice have completely altered the long stereotyped face of folk medicine inside Appalachia.

116. Characterization of Tyrosine Hydroxylase Interneurons in the Developing Cerebral Cortex of Rats, *Talha Ijaz, Biochemistry and Molecular Biology*
Mentor: Stephen Asmus, Biochemistry and Molecular Biology

The cerebral cortex is a region in the brain responsible for higher cognitive function. The cortex integrates information that arrives from other brain regions; this integration takes place with the help of interneurons—mostly inhibitory cells that are essential for controlling the response to a stimulus. The role of a subpopulation of interneurons that produce tyrosine hydroxylase (TH), an essential enzyme for synthesis of catecholamines, is not well understood. In this study we hope to find other physiological characteristics of TH-producing interneurons in the cerebral cortex of rats. Preliminary data suggest that these interneurons contain TH which is activated by addition of a phosphate group. Furthermore, TH-interneurons are co-localized with vasoactive intestinal peptide (VIP), a neuromodulator that plays an integrative role between energy metabolism, blood flow and neural activity. Taken together, preliminary results suggest that TH-interneurons produce the TH product L-DOPA and that they may also produce VIP.

117. Unraveling the Fabric of Fortune: Textiles in Virginia during the American Civil War, 1861-1865, *Virginia E. Reynolds, History*
Mentor: Clarence Wyatt, History

Considering the breadth of issues surrounding the American Civil War, textiles are a seemingly minute detail. However, examining the textile shortage through the study of a variety of sources, including material culture, enables a deeper understanding of civilian life, as shortages were a substantial burden. Four key elements contributed to the textile shortage in Virginia: a lack of manufacturing, presence of the northern blockade, general wartime conditions and the invading Union Army. Women, as the primary members of the Southern home front, responded to the shortage in a variety of ways. Many continued to wear the same clothing long after garments began to show signs of wear. Some elite women purchased items run through the blockade or ran the blockade northward, through army lines and over the Potomac River, themselves. Using textiles as a microcosm, many issues related to the Southern home front are put into clearer focus.

118. Empirical Analysis of the Chinese Housing Market, *Qianyu Yang, Economics*
Mentor: David Anderson, Economics

Before the mid 1980s, urban housing in China was allocated through government related organizations. During the past two decades, the Chinese government has implemented a series of policies designed to bring free market elements to the housing sector in urban China. However, being aware of the potential for inflation in the housing market, the Chinese government has implemented further policies to cool down the housing market. In order to explore the effectiveness of the government policies, this paper describes empirical analysis of the residential sector of the housing market from 2002-2006 and examines the correlation between residential housing prices and various related government policies.

119. A Spectroscopic Study of Volcanic Gases on a Thin-Film Salt Surface: Insight into Post-Eruptive Atmospheric Conditions, *Molly Lindle, Chemistry*
Mentor: Professor Keith Dunn, Chemistry

In this study we present new data on the photochemistry and spectroscopy of gaseous sulfur dioxide when deposited on a thin-film salt surface at low pressures and temperatures. This data is useful in understanding the interaction between volcanic gases and salt particulates in the atmosphere. Spectra taken with an FT/IR (Fourier Transform/Infrared) Spectrometer, coupled with information from volumetric studies, reveal a tendency of SO₂ molecules to form multiple layers on the salt surface, in some cases before a monolayer is formed. These spectra also show multiple frequencies of excitation for SO₂ in the infrared region of the electromagnetic spectrum, corresponding to two normal vibrational modes of SO₂. Absorption and luminescence spectra in the visible and ultraviolet regions give further insight into how SO₂, when adsorbed to salt, dissipates energy. This information could reveal more about how SO₂/salt interactions are affected by proximity to oceans, where atmospheric salt particulates are abundant.

120. MultiMedea: Retelling an Ancient Story in Digital Video, *Dan Burkey, Dramatic Arts*
Mentor: Professor Patrick Kagan-Moore, Dramatic Arts

This feature-length movie, written and filmed during the course of the last year, combines the plot and themes of Euripides' Medea with elements of film noir to highlight connections between the ancient Greek drama and cinematic storytelling. The screenplay came about through six months of writing, using iconic movies from the noir tradition as research. This research revealed common threads of desperate characters, anti-heroes, and the inescapable force of fate. In addition to the storytelling connections it makes, the project demonstrates modern video technology's ability to empower filmmakers on all levels without the need for a Hollywood budget. *Medea* was shot on digital video in and around Danville using Centre students as cast and crew.

121. Consequences of Conviction: The Law, Reentry, and Challenges Facing Kentucky's Female Offenders Upon Release, *Jillian Kenyon, Sociology*
Mentor: Sarah Goodrum, Sociology

This research examines how the criminal justice system and current laws and programs help or hinder the successful integration of female offenders reentering communities in Kentucky. A shift in national policy during the 1960s and 1970s from rehabilitative measures to punitive policies caused incarceration rates to climb to unforeseen levels. Women were drastically impacted by such laws, perhaps more so than men, often due to special circumstances prior to, during and after their release from prison. The data for this study come from in-depth interviews with nine women currently in prison and who have been incarcerated more than once. The findings indicate that women's needs (motherhood, substance use, physical and sexual abuse) are not adequately addressed by prison programming or post-release services. Current legislation often prevents released female offenders from receiving the assistance they need to transition back into their communities, increasing rates of relapse and recidivism.

NAME INDEX

(The number represents the presentation number for the author or faculty mentor, not the page number.)

Abrams, Andrea, 41	Cooley, Ben, 17	Hartmann-Mahmud, L., 24	McGinley, Katt, 25, 74	Schuttera, Shelby, 27
Adams, Paul, 36	Coppola, Brittany, 95	Hashweh, Zudhi, 4	McIntyre, Natalie, 59	Sears, Whitney, 84
Alimova, Katya, 98	Couch, Sarah, 78	Headley, Alex, 92	Meltzer, Scott, 62	Shaner, Carey, 28
Amir, Seth, 71	Cox, David, 55	Hench, Laura, 46	Menard, Erin, 39	Sharp, Grant, 95
Anderson, David, 118	Coxon, Brian, 90	Henry, Michael, 45	Mendez, Jasma, 65	Sikkel, Paul, 80, 84
Anderson, Kathryn, 24	Crain, Philip, 82	Hermann, Chris, 95	Mendoza-Forrest, S., 18	Sither, Emily, 57
Angel, Meredith, 82	Crocker, Julie, 54	Hogancamp, Emily, 81	Meredith, Bryce, 9	Skaggs, Rachel, 72, 101
Arbegust, Emily, 92	Cusato, Brian, 54, 57, 99	Hortillosa, J., 20, 43, 75	Milburn, Tara, 103	Skogsberg, K., 26, 100
Asmus, Stephen, 116	Dahlman, Rachael, 21	Horton-Thomas, Z., 34	Miles, Preston, 90	Slegers, R., 50, 51, 53
Axtell, Rick, 17, 20	Davis, Whitney, 70	Howell, Matt, 50	Misbach, Colin, 95	Smith, Dana, 74
Baird, Sarah, 115	Dawson, Rachel, 10	Humphrey, Sarah, 11	Montgomery, Ed, 27, 87	Smith, D., 9, 11, 73, 75
Barden, Allie, 12	Denbow, Alison, 41	Hutchinson, Katie, 6	Moore, David, 22	Smith, Morgan, 18
Barton, C., 16, 81-83	Denney, Carol, 108, 109	Ijaz, Talha, 116	Morrison, Jim, 12	Smith, Ryan, 5
Baumann, Chris, 77	Devine, Brittany, 48	Jackson, Kasey, 91	Murphy, Blair, 83	Snavely, Kelsey, 104
Behrendt, Laura, 19	Dew, S., 5, 78, 79	Jamison, Keri, 56	Muzyka, Jennifer, 89	Spalding, JC, 69
Bellver, P., 40, 42-45	Dunn, Keith, 14, 86, 119	Jerrell, Kayley, 111, 112	Myers, Danielle, 94	Spangler, Adam, 53
Bennett, Tate, 22	Eblen, Shannon, 105	Jia, Judith, 108, 109	Neiser, Jason, 13	Sweis, Laith, 16
Bentley, Kayt, 74	Estridge, Carla, 86	Johnson, B.K., 1, 3, 58, 67	Palisch, Chase, 79	Sweis, Sami, 29
Berry, Landon, 73	Fabritius, M., 60-61, 68-70	Jones, Charlotte, 102	Passariello, 19, 41, 115	Tapley, S., 110-112, 114
Bitsensky, L., 33-37, 70	Feigerle, Jordan, 89	Josic, Helena, 66	Perez, Millie, 41	Todd, Rebecca, 38
Blair, Josh, 72	Ferguson, Emily, 41	Joyce, Jane, 52	Petkus, M., 2, 4, 59, 66	Tomasic, John, 76
Borders, Kyle, 58	Fieberg, Jeff, 88	Kagan-Moore, P., 120	Polio, Willie, 15	Tubb, Amos, 29, 30
Bottom, Samantha, 99	Fioret, Bryan, 79	Kalugyer, Jacquie, 81	Raley, Melissa, 42	Tuttle, Ben, 80, 114
Boyle, Emily, 103	Fleming, Chris, 7, 54	Keach, Michael, 72	Rapone, Amanda, 44	Vo, My Vu Thuy, 67
Brooks, Greg, 92	Gagnon, PJ, 100	Keffer, Ken, 10	Reynolds, Ginny, 117	Walker, Kari, 72
Brown, Eric, 80	Gallt, Emily, 23	Kenyon, Jillian, 121	Rhule, Rebecca, 102	Wheeler, Jessica, 84
Buell, Cody, 90	Garriott, W., 21, 22, 23	Kutzler, Evan, 76	Richey, Peggy, 85	White, Brent, 56
Burgess, William P., 74	Garvey, Patrick, 92	LaFerriere, Nick, 93	Robinson, Chris, 47	White, Drew, 49
Burkey, Dan, 120	Glidden, Jeff, 20	Lederer, Phil, 51	Robinson, Kristen, 106	White, K., 101, 103
Burns-Cusato, 28, 55, 102	Glueck, Amanda, 99	Ledgerwood, R., 8	Roush, Justin, 1	White, Philip, 74
Byrd, Rachel, 64	Goodrum, S., 62- 65, 121	Lindhorst, Becky, 79	Royalty, Samantha, 54	White, Stuart, 74
Canelas, Anna, 79	Gordon, Cornelia, 52	Lindle, Molly, 14, 119	Rudd, Mary, 49	Whitehurst, Mary, 107
Carbone, Cristina, 32, 39	Green, Emily, 88	Lockett, Phil, 97	Russell, Jay, 61	Wilson, Chase, 87
Carden, Clayton, 35	Gruenewald, John, 13	Lownds, Kelsey, 37	Sabate-Llobera, N., 31	Wilson, Sarah, 81
Clodius, Mary Kate, 60	Gulley, Mary, 72	Lynn, Morgan, 93	Samhat, Nayef, 92-95	Woehrle, Abby, 93
Collins, Anne, 96	Hallock, M., 105-107	Marijanovic, Nina, 26	Sanchez, Erica, 31, 40	Wu, Ying, 2
Colagross, Ashley, 85	Hamilton, Brice, 97	Martinolich, Kathy, 32	Santini, Ana, 85	Wyatt, Clarence, 77, 117
Comstock, Cameron, 74	Hamilton, Mykol, 25, 104	Maurer, Lindsay, 3	Saulino, Brian, 55	Wyatt, Corwyn, 33
Conkright, Chris, 68	Haque, Sara, 96	McAllister, A., 15, 46, 47	Saylor, Kyle, 100	Yang, Qianyu, 118
Connolly, Allison, 91	Hargis, Sarah, 63	McGill, Joey, 30	Schultz, Annie, 113	Ziemba, Rob, 84

DISCIPLINE INDEX

(The number represents the presentation number, not the page number.)

Anthropology and Sociology, 19, 38, 41, 62, 63, 64, 65, 76, 77, 115, 121
Art, 108, 109, 110, 111, 112, 113, 114,
Art History, 32, 39
Biochemistry and Molecular Biology, 5, 6, 7, 8, 78, 79, 85, 116
Biology, 16, 80, 81, 82, 83, 84
Chemistry, 86, 87, 88, 89, 119
Classical Studies, 12, 52
Computer Science, 48
Creative Writing, 9, 10, 11, 73, 75
Dramatic Arts, 105, 106, 107, 120
Economics, 1, 2, 3, 4, 58, 59, 60, 61, 66, 67, 68, 69, 70, 118
Education, 49
English, 9, 10, 11, 74
Environmental Studies, 90
Financial Economics, 66, 67
French, 10, 91
Gender Studies, 41
Government, 21, 22, 23
History, 29, 30, 77, 117
Humanities, 72
International Studies, 24, 92, 93, 94, 95
Mathematics, 46, 47, 96
Music, 33, 34, 35, 36, 37, 71
Philosophy, 50, 51, 53
Physics, 13, 14, 15, 47, 97
Psychobiology, 27, 28, 54, 55, 56, 57, 99, 100
Psychology, 25, 26, 101, 102, 103, 104
Religion, 17, 18, 20
Spanish, 31, 40, 42, 43, 44, 45



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