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ALBION COLLEGE

2006

THE SEVENTEENTH ANNUAL ELKIN R. ISAAC STUDENT RESEARCH SYMPOSIUM

ALBION COLLEGE

APRIL 26-27, 2006

SCHEDULE OF EVENTS

Wednesday, April 26, 2006

7:30 p.m. **Elkin R. Isaac Alumni Lecture: Joseph S. Calvaruso, '78**
"Albion College: The Training Camp for the Nine Innings of Life"

Welcome: President Peter T. Mitchell, '67
Speaker Introduction: Larry E. Steinhauer, Professor of Economics and Management
Bobbitt Visual Arts Center Auditorium

Reception immediately following the program

Thursday, April 27, 2006

8:30-10:30 a.m. **Student Research Platform Presentations**
See also detailed schedule of presentations on pages 4-6.

Forum #1
Palenske 121

Forum #2
Palenske 123

Forum #3
Palenske 227

Forum #4
Bobbitt Visual Arts Center Auditorium

10:45 a.m.-Noon **Honors Convocation**
Goodrich Chapel

1:15-4:15 p.m. **Student Research Platform Presentations**
See locations listed for morning session.

3:30-4:30 p.m. **Student Research Poster Session**
Gerstacker Commons, Kellogg Center

4:30-5:30 p.m. **Dedication of Bruce A. Kresge Hall**
Kresge Hall

Reception immediately following the program

7 p.m. **Joseph S. Calvaruso Keynote Address: Regina Carter**
"An Evening of Jazz and Conversation"
This program will be a lecture-demonstration by Ms. Carter and her quintet.

Welcome: President Peter T. Mitchell, '67
Conferral of Honorary Degree: President Mitchell and Andrew O. Bishop, Associate Professor of Music
Speaker Introduction: Brent K. Clore, '06
Goodrich Chapel

CD-signing and reception immediately following the program
Bobbitt Visual Arts Center Lobby

ELKIN R. ISAAC ALUMNI LECTURE

Joseph S. Calvaruso, '78

Joseph Calvaruso currently serves as senior vice president and director of risk management for Mercantile Bank in Grand Rapids. He is also secretary and treasurer for the Board of Directors of Michigan Certified Development Corporation, which provides funding for business start-ups and expansions. As a member of the Michigan chapter of the Risk Management Association, he has held numerous leadership positions, including the presidency, and won many achievement awards. He has also served on the association's international Board of Directors and on numerous national committees.

Prior to joining Mercantile Bank, Calvaruso spent nearly 20 years as executive vice president of Chemical Bank Shoreline in Benton Harbor. He left that job in June 2004 to join Vice President Dick Cheney's reelection campaign as a member of the national advance team. Over the past six years, Calvaruso has also served as a coordinator for visits to Michigan and throughout the country by members of the Bush administration. Earlier in his career, Calvaruso held positions with City Bank in Jackson and Comerica Bank in Kalamazoo.

Calvaruso sits on the Gerald R. Ford Institute for Public Policy and Service Visiting Committee at Albion College and is a former member of the Michigan Work Force Investment Board. He is a past chairman of the Kalamazoo County Republican Party and is a current member of the Republican State Committee.

In 2005, Calvaruso and his wife, Donna, endowed the Joseph S. Calvaruso Keynote Address for this symposium. In keeping with Calvaruso's personal goal to "try different things in life," the keynote endowment ensures the symposium will continue to provide an exceptional variety of presenters from the arts, sciences, social sciences, and humanities. An Albion native and a product of the Albion Public Schools, Calvaruso graduated from Albion College in 1978 and holds an M.B.A. from Western Michigan University.

JOSEPH S. CALVARUSO KEYNOTE ADDRESS

Regina Carter

Jazz violinist Regina Carter's eclectic and electric talents have endeared her to tough critics, A-list recording artists, and music lovers worldwide. From festival stages to symphony halls to intimate clubs, Carter is at home, technically and artistically, playing jazz, blues, classical music, and her own compositions.

In 2001, the Detroit native made music history as the first jazz violinist and first African-American musician invited to play Nicolo Paganini's famed Guarneri violin, the "Cannon," one of Italy's national treasures. Subsequently, the Italian government transported the violin to New York, where Carter played it for a sold-out audience in Lincoln Center.

The daughter of a Ford autoworker and a teacher, Carter began playing violin as a preschooler. As a teenager, she attended master classes with Itzak Perlman and Yehudi Menuhin, and played with the Detroit Symphony Civic Orchestra. She eventually spent two years at the New England Conservatory of Music, coming to an awareness that the life of a classical musician was not for her. Carter graduated from Oakland University with a degree in music performance, then spent time in Germany, Detroit, and New York, chasing her dream of forming her own ensemble.

Today, with and without her quintet, Carter performs at jazz festivals, clubs, and concert halls worldwide. She has performed and recorded with artists including Wynton Marsalis, Aretha Franklin, Billy Joel, Dolly Parton, Tanya Tucker, Nadja Salerno-Sonnenberg, Mary J. Blige, and Lauryn Hill. She has also appeared with symphony orchestras from Atlanta to Minneapolis, and was featured at the 2005 Hong Kong Arts Festival. During the first four months of 2006, Carter has had engagements at the Kennedy Center for the Performing Arts in Washington, D.C., Davies Symphony Hall in San Francisco, and New York's Lincoln Center, among other venues.

Carter has recorded five albums under her own name, including *Rhythms of the Heart*, which made *Time* magazine's 1999 "Best Music of the Year" list; *Freefall*, a Grammy-nominated collaboration with pianist Kenny Barron; and *Paganini: After a Dream*, a collection of classical, film, and original works recorded in Italy on the Cannon. A sixth album of jazz standards, *I'll Be Seeing You: A Sentimental Journey*, is scheduled for release in June.

Carter has been heralded by numerous national media outlets, including CBS' "60 Minutes II," the *New York Times*, the *Wall Street Journal*, Oprah Winfrey's *O* magazine, and National Public Radio.

STUDENT PRESENTATION SCHEDULE – Thursday, April 27, 2006

FORUM #1 – Palenske 121

8:30	Ross O'Hara (M. Walter)	The Parsimony of Electoral Decision-Making: Need for Cognition and Need for Closure as Predictors of Political Interest
8:45	Victoria Brown (Christopher)	Individual Differences in Math Attitudes
9:00	Spencer Dawson (M. Walter)	Social Dominance Orientation, Right-Wing Authoritarianism, and Similarity Effects in Biracial Elections
9:15	Maria Pintar (J. Walter)	A Naturalistic Study of Post-Conflict Interactions among Preschool Boys and Girls
9:30	Amy Naramore (Berkey)	Body Image and Self-Esteem among Elementary School Girls
9:45	Karly Redburn (J. Walter)	Adolescent Conflict between Siblings and Peers: Affective Quality and Conflict Resolution
10:00	Jennifer Najjar (Christopher)	Effects of Employee Age and Sex on Perceptions of Personality and Professional Competency
10:15	Jordan Troisi (Christopher)	Predicting Money Motives: The Interactive Effects of the Protestant Work Ethic and the Need for Cognition
1:15	Troy Piwowarski (M. Walter)	Effects of Mortality Salience and Literal Immortality on Prejudicial Beliefs
1:30	Erin Lusk (Berkey)	The Social Construction of Gender in Middle Childhood
1:45	Lauren Downham (Jenson)	Perceptions of Aging and Recovery from an Acute Event
2:00	Liliane Saliba (Christopher)	Locus of Control, Materialism, and Well-Being
2:15	Eric Ziem (M. Walter)	Attitudes toward Capital Punishment
2:30	Cameron Harris (Jechura)	The Effect of Alcohol on Jet Lag Recovery in the Diurnal Rodent, *Octodon degus*
2:45	Megan Anderson (Wilson)	Within-Subject Comparison of Appetitive Delay and Trace Pavlovian Conditioning in the Rat: Effects of Scopolamine
3:00	David Goodyear (Wilson)	Within-Subject Comparison of Appetitive Delay and Trace Pavlovian Conditioned Inhibitors in the Rat: Effects of Scopolamine
3:15	Jonathan Zombeck (Wilson)	The Interaction of Ginseng and Nicotine on Anxiety
3:30	Ashley E. Alker, Jaime Fornetti (Saville)	Comparing DNA Repair in Two Different Strains of *Drosophila*
3:45	Andrew Hasley, Brandon Hill (Scheel)	Phylogenetic Analysis of Netrin Genes
4:00	Stephanie Clark, Wendy Simanton (Scheel)	Netrins: Creating Divergent Axon Morphologies

FORUM #2 – Palenske 123

8:30	Eric Krieger (Levine)	Who Graduates under the No Child Left Behind Act?
8:45	Erin Lusk (Levine)	Policy Analysis of the Effectiveness and Implementation of the School Choice Provision of No Child Left Behind
9:00	Matthew Lozen (Levine)	The Problems of Qualification: A Look at No Child Left Behind
9:15	Zachary Dagneau (Cocks)	Engineered Destruction: Environmental Disaster and Dissent in the USSR
9:30	Lindsay Zeigin-Netter (Dick)	Appalachia: The True Cost of Coal
9:45	Patrick Ryan (Yewah)	Law, Literature, and the U.S. Constitution: A Defense of Textual Autonomy
10:00	Amy Krieg (Frandsen)	Aligning Executive and Shareholder Interests
10:15	Christina Wade (Hagerman)	The Construction of the Ideal Gentlemen or the Making of Future Imperialist Leaders
1:15	Jessica Atkinson (Rose)	Women of Afghanistan: The Clash of Western Human Rights Ideals with a Non-Western Culture
1:30	David Geer (Franzen)	The Hijra and Kothi Sex Workers of India: A Fight for Civil and Human Rights
1:45	Steven Peruski (Dabney)	Social Support of Female Legislators in the State of Michigan
2:00	Sarah Richardson (Togunde)	Household Size and Composition as Correlates of Child Labor in Urban Nigeria
2:15	Samantha Newman (Togunde)	Value of Children, Child Labor, and Fertility Preferences in Urban Nigeria
2:30	Arielle Carter (Togunde)	Socio-economic Causes of Child Labor in Urban Nigeria

2:45	Atlee McFellin (Rose)	Feelings, Emotions, and the Historical Materialism of Karl Marx
3:00	Tamar Vescoso (Terstriep)	Grave Robbing to Donor Bequest: The Changing Perception of Cadaver Use in Medicine from the Nineteenth Century to the Present Day
3:15	Joe Taylor (Melzer)	Barriers, Stigma, Support, Hope: Transitional Housing Residents' Experiences with HIV/AIDS and Homelessness
3:30	Brent Clore (Rose)	Why We Protect Virtual Child Pornography: An Analysis of the Child Pornography Protection Act of 1996 and *Ashcroft v. Free Speech Coalition*
3:45	Matthew Milligan (Raj)	Early North Indian Buddhism: Architecture and Epigraphy in the Extant Record
4:00	Jayne Ptolemy (Sacks)	"In Decency of . . . Oconomy": Race and Respectability in Early National Philadelphian Benevolence

FORUM #3 – Palenske 227

8:30	Catherine Fontana, Cameron Harris (McCurdy)	Simulation of Parasitism in *Armadillidium vulgare*
8:45	Jaime Gonsler (Lyons-Sobaski)	Adhesive Seed Dispersal by Bison of the Konza Prairie
9:00	Joseph Smith (Harris)	Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of 1-ethyl-3-methylimidazolium tetrafluoroborate [EMIM] [BF_4]
9:15	Natalie McKinney (Bieler)	Time Resolved Dissociation Dynamics of Ne_2Br_2 and Ne_3Br_2 Clusters
9:30	Hillary Burgess (Skean)	An Analysis of Vegetation at Brandt Woods, a Selectively-Logged Forest in Calhoun County, Michigan
9:45	Sarah Beaudoin (Harris)	Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of 1-ethyl-3-methylimidazolium ethylsulfate
10:00	Diana Lancaster (McCurdy)	Intersex Mating Behavior in the Amphipod *Corophium volutator*
10:15	Daniel Painter (McCurdy)	Reproductive Behavior of Intersexes in the Intertidal Amphipod *Corophium volutator*
1:15	Elizabeth Murrenus (Green)	Environmental Estrogens
1:30	Daniel Wreschnig (Skean)	The Effect of Warming on Deciduous Forest Growth in the Eastern United States, with Data from Oak Ridge, Tennessee
1:45	Amy Hupp (Carrier)	Do Abiotic Factors Affect Diel Movements of Adult Nurse Sharks, *Ginglymostoma cirratum*, in the Dry Tortugas (Florida) Reproductive Refuge?
2:00	Rachel Ransom (Carrier)	Monitoring Blood Parameters for a Captive Population of Nurse Sharks (*Ginglymostoma cirratum*)
2:15	Lindsay Rubin, Jennifer Smith (Carrier)	Sensory System Functions in Nurse Sharks (*Ginglymostoma cirratum*): Acquisition and Interpretation of Electrophysiology in Olfactory and Acoustic Nerve Pathways
2:30	Sarah Carver (White)	A Shortened Molecular Method for Undergraduate Detection of Fecal Coliforms in Environmental Samples
2:45	Daniel Harris (Schmitter)	Global Transcriptional Regulation of Iron-Responsive Genes in *Shewanella oneidensis* MR-1
3:00	Kristen Krum (McCurdy)	Prevalence of *Aeromonas hydrophila* Bacteria on Frogs and Toads at Michigan's Pierce Cedar Creek Institute
3:15	Shauna Paradine (French)	Synthesis of a Chiral Hypervalent Iodine Reagent Starting from (S)-Propylene Oxide
3:30	Emily Armstrong (Harris)	Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of Trioctylmethylammonium bis(trifluoromethylsulfonyl) Imide
3:45	J. Kendall Adams (Bartels)	A Morphometric Analysis of *Hyopsodus* (Mammalia: Condylarthra) from the Wasatchian and Bridgerian Eocene of the Green River Basin, Wyoming
4:00	Andrew Lake (Reimann)	BRUW: Bandwidth Reservation for User Work

(continued on next page)

FORUM #4 – Bobbitt Visual Arts Center Auditorium

8:30	Troy Piwowarski (Goering)	Facing the Authoritarian: Artistic Depiction of a Troublesome Personality Orientation
8:45	Rachel Szymanski (Melzer)	The Career Experiences of Professional Musicians
9:00	Nicole Trachsel (Wickre)	Art and Autonomy in Scotland
9:15	Danielle Fowler (MacInnes)	adolescent_lit@the-millennium
9:30	Shelly McLeod (Bishop)	The Art and Craft of Composition: A Creative Project Designed to Compose a Piece for Woodwinds and Percussion
9:45	Amanda Cross (Oswald)	Five Months of "Mate"
10:00	Amy Riske (Bishop)	Creation of the New: Music Composition as a Means of Self-Expression
10:15	Natalie Corbin (Mesa)	"Standing on the Midway: A Poetic Sequence"
1:15	Rachael Lyon (Mesa)	"Double Exposed": A Collection of Poems and Prose Inspired by Integration in Little Rock
1:30	Ashley Larimer (Balke, Lee, Ball)	The Aria, "Steal Me, Sweet Thief," from Menotti's Opera *The Old Maid and the Thief*
1:45	Eric Johnson (Stotz-Ghosh)	"Annus Mirabilis"
2:00	Stephanie Mann (Sacks)	Southern Medical Distinctiveness: Realities and Rhetoric in Retrospect
2:15	Jenna Caponey (Ball, Miller)	Kent Kennan's *Night Soliloquy*
2:30	Christine Bell (Mesa)	"Definition of Snow": A Collection of Poems Concerned with Gender and Identity
2:45	Sarah Wingo (Young)	Popular Culture as Propaganda: Finding Madonna in Shakespeare
3:00	Dayna Cleland, Allison Gessner (Ball, R. Van de Ven)	Concerto à Cinque in G Major, Opus 9, No. 6, by Tomaso Albinoni
3:15	Audrey Coleman (Young)	'The Butch' and 'The Bitch': Heteronormativity in *The Birdcage* and *Brokeback Mountain*
3:30	Miranda Green (Wahl)	Beauty Is Only Skin Deep
3:45	Heather Handlon (Dick)	Standing at the Crossroads of the Environmental Crisis: Rediscovering Thoreau, Muir, and Leopold
4:00	Jason Sebacher (Wickre)	The Keys to the Cabinets: Understanding Dalinian Philosophy

POSTER PRESENTATIONS – Gerstacker Commons, Kellogg Center, 3:30-4:30 p.m.

Rebekah Bahr-Meyerholt (Lyons-Sobaski)	The Effects of Cadmium and Lead on the Growth and Reproduction of *Brassica rapa*
Meagan Bosket, Lauren Sayig (Kennedy)	Does Movement of Foraging Black-capped Chickadees in the Whitehouse Nature Center Differ between Sexes?
Christina Busuito (Wilson)	Within-Subject Comparison of Appetitive Delay and Trace Pavlovian Conditioning in the Rat: Effects of Medial Septal Lesions
Robert Buszek (Bieler)	Kinetic Study of the Reaction of Bromine with Alkanes and Alkenes
Andrew Fidler, Katie Riepen (Bieler)	Photophysics of Cinnamic Acid Derivatives
Megan Fitzpatrick, Ashley Gardner (Kennedy, White)	Nest Structure, Incubation, Egg Viability, and Sex Ratio in Tree Swallows in Whitehouse Nature Center
Sarah Gebhardt (Keyes)	Children and Race
David Goodyear (Kennedy)	Does the Source of DNA Matter? A Comparison of DNA from Feathers and Blood of Nestling House Wrens and Tree Swallows
Bethany Gozdzialski (C. Van de Ven)	Change in Water Depth from 1971 to 2005 in Albion's Lower Millpond
Cameron Harris (Christopher)	Affective Reactions to Affluence Acquisition: The Mediating Effects of Perceived Conscientiousness
Heather Horobik (Villamil)	Exploring the Intricacies of Archaeological Site Surface Survey: A Case Study of Körösladány 14
Courtney Mangus (Saville)	Detection of Global and Gene-Specific Uracil Levels in Down Syndrome and Non-Down Syndrome Myelogenous Leukemic Cell Lines
Sarah Simmons (French)	Progress toward a New Class of Chiral Hypervalent Iodine Reagents
Anna Stroud (Harris)	Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of Ammoeng 100

ABSTRACTS OF STUDENT PRESENTATIONS

J. KENDALL ADAMS, '07

A Morphometric Analysis of *Hyopsodus* (Mammalia: Condylarthra) from the Wasatchian and Bridgerian Eocene of the Green River Basin, Wyoming

Faculty Sponsor: William Bartels

Majors: Geology, Biology
Hometown: Dearborn, Mich.

Hyopsodus is a small primitive ungulate (condylarth) that lived in North America from the latest Paleocene (Clarkforkian Age, approximately 52 million years ago) through the late Eocene (Uintan Age, 43 million years ago). Fossil jaws and isolated teeth of *Hyopsodus* are common in the Eocene deposits of Wyoming, but are also present in the Eocene beds of Europe and Mongolia. *Hyopsodus* has featured prominently in studies and debates of macroevolution in mammals. Fossil teeth, particularly cheek teeth (premolars and molars), from the Wasatchian and Bridgerian (middle Eocene) of the Green River Basin in Wyoming are described and analyzed morphometrically for size and shape. Roughly 700 specimens were measured with attention to linear dimensions and cusp morphology. These data were aggregated by coarse stratigraphic levels ranging from the latest Wasatchian (Wa7) through the Bridgerian (Br3) of the Eocene. Sample sizes for all teeth are rather small, but in each tooth a last-occurrence event is discernable at the Br1a-Br1b boundary. A distinct larger-sized lineage of *Hyopsodus* is not found immediately above this boundary in the Green River Basin, whereas a smaller-sized lineage is found throughout, which trends toward a larger size in Br2-3. Causal explanations of this pattern as well as other analyses are continuing.

Supported by: FURSCA, Geological Sciences Department Taylor Fund, University of Michigan Museum of Paleontology, Arnold G. Langbo Trustees' Professorship (Bartels)

ASHLEY E. ALKER, '06

Majors: Biology, Spanish
Hometown: Harbor Springs, Mich.

JAIME FORNETTI, '06

Major: Biology
Hometown: Iron Mountain, Mich.

Comparing DNA Repair in Two Different Strains of *Drosophila*

Faculty Sponsor: Kenneth Saville

Alker

Fornetti

DNA damage is a common occurrence. Unrepaired DNA damage leads to genetic instability and contributes to the development of cancer. One type of DNA damage is double strand DNA breakage (DSB). There are two mechanisms to repair DSBs: homologous recombination (HR) and non-homologous end-joining (NHEJ). HR uses a template to copy the proper sequence into the DSB, and NHEJ involves the joining of DNA ends without using a template. HR is the predominant DSB repair mechanism in lower eukaryotes such as yeasts, and NHEJ is the predominant pathway for DSB repair in mammalian cells. We are investigating HR and NHEJ in the fruit fly *Drosophila melanogaster*. To create DSBs in flies, we are utilizing the transposable element *hobo*. These mobile pieces of DNA "jump out" of their original location in the genome and reinsert themselves in a different location. After they jump out, the original site of insertion is repaired. To create an environment in which HR could occur, we used a fly strain with *hobo* inserted into the second chromosome. Because there are two copies of the second chromosome, a homologous template is available for repair. In contrast, to study NHEJ a fly strain with *hobo* inserted into the X chromosome of male *Drosophila* was used. We hypothesize that because there is only one X in males, homologous recombination cannot occur, and NHEJ will be used instead. Once DSBs were created, the repaired region was amplified using PCR, cloned, and sequenced to determine the pattern of repair.

Supported by: FURSCA

MEGAN ANDERSON, '07

Within-Subject Comparison of Appetitive Delay and Trace Pavlovian Conditioning in the Rat: Effects of Scopolamine

Faculty Sponsor: W. Jeffrey Wilson

Major: Psychology
Hometown: Clarkston, Mich.

We compare delay and trace conditioning of autoshaped nosepoke responses in Sprague-Dawley rats. This clearly appetitive response requires longer conditioned stimulus-unconditioned stimulus intervals than are typically used in eyeblink conditioning, and involves a less automatic response. Trace and delay responses were acquired at comparable rates in control rats. Rats receiving scopolamine acquired the delay responses more slowly than they did the trace responses.

Supported by: FURSCA

EMILY ARMSTRONG, '06

Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of Trioctylmethylammonium bis(trifluoromethylsulfonyl) Imide

Faculty Sponsor: Clifford Harris

Major: Chemistry
Hometown: Marquette, Mich.

Some chemical and physical properties of trioctylmethylammonium bis(trifluoromethylsulfonyl) imide have been measured. These included HNMR, CNMR, and IR spectroscopic characterization as well as determination of solubility in water and a variety of organic solvents. The interaction of the neat ionic liquid and potassium permanganate solid was also studied to determine this ionic liquid's suitability for use as a permanganate oxidation solvent.

Supported by: EcoSynthetics

JESSICA ATKINSON, '06

Women of Afghanistan: The Clash of Western Human Rights Ideals with a Non-Western Culture

Faculty Sponsor: William Rose

Majors: Political Science, English
Hometown: Canton, Mich.

With the formation of the United Nations, the fall of old empires, and the emergence of new regimes, the issues of human rights violations have been named and thrown increasingly into the media spotlight. Human rights are a largely Western strain of thought; human rights ideology tends to ignite tensions lying between the idea of universal human rights and local cultures. Women make up a very interesting case for human rights study because they comprise roughly half of the population, and yet violations of their rights are almost a norm in many areas.

The thought of applying one idea of human rights universally is next to impossible at the present time. There is no international body that can enforce a standard set of human rights all over the world. Most cultures or localities have their own codes defining the rights of men and women, whether they are written or unwritten.

I have applied these ideas to a very specific case study of women and their condition under the Taliban regime in Afghanistan. Women's lives were extremely restricted, and this case study brings to light issues stemming from "culturally determined" human rights. The Taliban repeatedly ignored UN warnings, proving that it is extremely difficult to force compliance with any sort of international set of human rights.

Supported by: FURSCA

REBEKAH BAHR-MEYERHOLT, '06

The Effects of Cadmium and Lead on the Growth and Reproduction of *Brassica rapa*

Faculty Sponsor: Sheila Lyons-Sobaski

Major: Biology
Hometown: Caro, Mich.

All living things are connected to the soil through the food web, so it is a major problem when the soil gets contaminated. Land plants are the base of the terrestrial food web, and are dependent upon soil for obtaining nutrients required for growth and reproduction. If the soil is contaminated, then plants could possibly uptake toxins. Although there are many different types of contamination, in Albion the predominant type has been contamination by heavy metals such as lead, zinc, chromium, and cadmium. What are the long-term effects of heavy metals on plants and do these metals persist over generations? This experiment is being done in order to test the hypothesis that heavy metals, such as lead and cadmium, will negatively impact the growth and reproduction of *Brassica rapa*. Plants were measured for differences in height, leaf width, number of flowers, number of fruits, number of seeds, and physical appearance. Plant biomass was then analyzed using the ICP-AES, in order to observe where the greatest concentration of metals was stored. Initial observations indicate that plants grown in contaminated soil grew faster than those in the control group.

SARAH BEAUDOIN, '06

Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of 1-ethyl-3-methylimidazolium ethylsulfate

Faculty Sponsor: Clifford Harris

Major: Chemistry
Hometown: Alpena, Mich.

Some chemical and physical properties of 1-ethyl-3-methylimidazolium ethylsulfate have been measured. These included HNMR, CNMR, and IR spectroscopic characterization as well as determination of solubility in water and a variety of organic solvents. The interaction of the neat ionic liquid and potassium permanganate solid was also studied to determine this ionic liquid's suitability for use as a permanganate oxidation solvent.

Supported by: EcoSynthetics

CHRISTINE BELL, '06

"Definition of Snow": A Collection of Poems Concerned with Gender and Identity

Faculty Sponsor: Helena Mesa

Majors: English, French
Hometown: Ann Arbor, Mich.

"Definition of Snow" is a collection of poetry loosely focused on the themes of gender and identity. The pieces comment on turning points and experiences that shape an identity, with a particular interest in the effects of sexuality and sexual experience. The poems are mostly lyrical dramatic narratives: poems narrated by a character other than the writer. These pieces play with classical mythology, fairy tales, the sciences, astrology, and the writer's own experiences during her semester abroad in France. Within this collection, there is a sense that characters are trying to move toward understandings of these defining experiences. They reflect many of the questions the writer has asked herself about her own life and memories.

MEAGAN BOSKET, '09

Major: Geology
Hometown: Sault Ste. Marie, Mich.

LAUREN SAYIG, '08

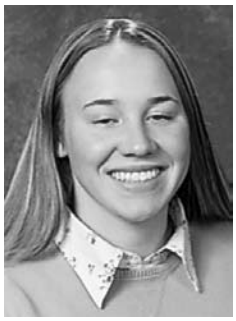
Majors: Spanish, Economics and Management
Hometown: Livonia, Mich.

Does Movement of Foraging Black-capped Chickadees in the Whitehouse Nature Center Differ between Sexes?

Faculty Sponsor: E. Dale Kennedy

Black-capped chickadees (*Poecile atricapillus*) in the Whitehouse Nature Center may move between various feeders to forage. We observed three feeders over a two-year period. We captured birds using mist nets, and we banded and took blood samples from 37 chickadees to determine sex. Using a QIAGEN DNeasy™ kit, we extracted DNA from the blood, used polymerase chain reaction to amplify the CHD-1 gene on the sex chromosome, and ran gel electrophoresis to separate and visualize it. Sex was recorded and compared with behavioral observations. We tested our null hypothesis, which is that sex does not affect movements of chickadees. Results will be discussed.

Bosket



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Supported by:
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VICTORIA BROWN, '06

Individual Differences in Math Attitudes

Faculty Sponsor: Andrew Christopher

Major: Psychology
Hometown: Clinton Township, Mich.

The current study examined the need for cognition (NFC), fear of negative evaluation (FNE), objective experience with math, subjective competence at math, gender, and age as predictors of four different attitudes toward math.

Undergraduate students (N = 272) completed a series of questionnaires examining individual differences in math anxiety. Included were Cacioppo (1984) et al.'s 18-item NFC scale (e.g., "I find satisfaction in deliberating hard and for long hours"), Leary's (1983) brief 12-item FNE scale (e.g., "I often worry that I will say or do the wrong things"), an 18-item fear of negative math evaluation scale (e.g., "I feel very upset when I make a mathematical error"), and a math attitudes scale that measured four attitudes about math: *positive affect* toward math, *cognitive competence* in math, the *value of math in life*, and the *simplicity of math*. Finally, participants provided indices of objective experience with math and subjective experience with math.

Our results indicate that math-specific fear of negative evaluation is associated with less *positive affect* toward math, lower perceived *cognitive competence* in math, and less *simplicity of math* (i.e., belief that math is difficult). In addition, *subjective competence* in, but not *objective experience* with, math also predicted each of these three math attitudes. Sex differences emerged only on the perceived value of math, as males tended to see more value of math in life than did females, which perhaps suggests a socialization of males toward more math-oriented careers.

HILLARY BURGESS, '06

An Analysis of Vegetation at Brandt Woods, a Selectively-Logged Forest in Calhoun County, Michigan

Faculty Sponsor: Dan Skean

Major: Biology
Hometown: Williamston, Mich.

Brandt Woods, a ca. 100-acre (40 ha) property located in Sections 7 & 8, T2S, R4W in Sheridan Township, is owned by the Calhoun Conservation District and managed as a demonstration woodlot and summer outdoor education center. Approximately 70 acres (28 ha) consists of beech-maple forest. Brandt Woods has been visited by Albion College classes since the 1950s and studied floristically since 1988. Selective logging took place in 1997, 2001, and 2004 in three different tracts of the woods. In the fall of 2004, after the most recent cut, stratified random sampling (n=106) along E-W transects placed 30m apart was used to determine the composition of the forest. Woody plants above 2.5cm d.b.h. were sampled using the point-quarter method; herbaceous plants and woody seedlings in the understory were sampled in $1m^2$ plots.

In the logged areas, the woody plants with the highest importance values (rel. density + rel. dominance + rel. frequency)

were: sugar maple, *Acer saccharum* (130.1); American beech, *Fagus grandifolia* (25.7); basswood, *Tilia americana* (18.0); hop-hornbeam, *Ostrya virginiana* (15.1); and red oak, *Quercus rubra* (14.8). These were compared to woody plant importance values obtained similarly in 1991. Importance values (rel. cover + rel. frequency) for the understory species were calculated to compare the different-aged logging tracts. The 1997 tract (n=33) had the following five most important species: sugar maple seedlings (16.0); sedges, *Carex* spp. (9.1); violets, *Viola* (8.8); asters, *Aster* spp. (6.9); and unidentified Rosaceae (5.0). The 2001 tract (n=31) had: wood nettle, *Laportea canadensis* (8.8); violets (8.5); sugar maple seedlings (7.7); clearweed, *Pilea pumila* (7.3); Virginia-creeper, *Parthenocissus quinquefolia* (5.8). The 2004 tract (n=37) had: violets (9.3); ash seedlings, *Fraxinus americana* (5.9); sedges (5.2); Rosaceae (5.1); and sugar maple seedlings (5.1). Using a vascular plant checklist compiled from previous floristic studies, a Floristic Quality Index (F.Q.I.) of 66.7 was calculated for the woods.

CHRISTINA BUSUITO, '07

Within-Subject Comparison of Appetitive Delay and Trace Pavlovian Conditioning in the Rat: Effects of Medial Septal Lesions

Faculty Sponsor: W. Jeffrey Wilson

Major: Biology
Hometown: Cheboygan, Mich.

Delay Pavlovian eyeblink conditioning requires no brain structures anterior to the cerebellum, while trace conditioning requires a functional hippocampus. We examined the effects of cholinergic denervation of the hippocampus via electrolytic lesions of the medial septum on trace and delay conditioned nosepoke responses (an appetitive task) in rats. Histological verification of the lesion sites is pending, but it appears that medial septal lesions in trained rats had no effect on the conditioned responses (CRs). In naive rats the lesion reduced responding overall, but did little to the ability of the rats to acquire the response. Trace and delay CRs were not differentially affected by the lesion, in contrast to another finding from our laboratory that systemic muscarinic blockade by scopolamine impaired delay more than trace CRs. We consider the implications of these results for appetitive vs. aversive conditioning and for cholinergic involvement in Pavlovian conditioning.

Although it is known that the hippocampus is responsible for learning and memory, there are still many processes that are not completely understood. In 1998 McEchron et al. showed that rats with a hippocampectomy were not able to learn trace fear conditioning but were able to learn delay, suggesting that the hippocampus is used during trace conditioning. In 2000, Shors et al. found that rats with a lesioned hippocampus could learn trace conditioning only after learning delay with the same stimulus. Their study also involved eyeblink conditioning. Little research has been done examining the role of the hippocampus in appetitive Pavlovian conditioning. In two separate experiments we disrupted the cholinergic input to the hippocampus via electrolytic lesions of the medial septum, and examined the effects on already established Pavlovian CRs (Experiment 1) and on the acquisition of these CRs (Experiment 2). Both delay and trace CRs were examined in each subject in a within-subject design, allowing a direct comparison of these two types of CRs.

Supported by: FURSCA, Neuroscience Program, Psychology Department

ROBERT BUSZEK, '06

Kinetic Study of the Reaction of Bromine with Alkanes and Alkenes

Faculty Sponsor: Craig Bieler

Major: Chemistry
Hometown: Fraser, Mich.

The reaction of molecular bromine, Br_2, with organic molecules has been traditionally used as a character test for double or triple bonds within a molecule. This study sets out to measure the rate of the reaction of bromine with various classes of hydrocarbons. Since alkenes contain double bonds, they react very quickly with bromine, and it is difficult to easily determine the rate of this reaction. Stopped-flow techniques combined with UV/Visible spectroscopy can be used to obtain the rate constant with relative ease. Alkanes, on the other hand, do not react freely with bromine, and a reaction must be induced by photolysis. For these reactions, a mixture of reactants was subjected to intense light at various wavelengths, and the loss of bromine reactant was monitored by visible spectroscopy at various times. The parameters necessary to cause these reactions will be reported.

Supported by: Chemistry Department

JENNA CAPONEY, '07

Kent Kennan's *Night Soliloquy*

Faculty Sponsors: James Ball, Tess Miller

Major: Music Education
Hometown: Livonia, Mich.

Kent Kennan was born in 1913 in Milwaukee, Wisconsin and died only a few years ago in 2003. He began his musical studies on piano at age six and shortly thereafter started studying the organ and flute. He attended the University of Michigan and the Eastman School of Music where he received degrees in composition and music theory. At the age of 23 he received the Prix de Rome. This award allowed him to study for three years in Europe. Kennan spent most of his teaching career at the University of Texas and devoted much of his time to teaching rather than composing. At the age of 43 he composed his last major work and from then on composed only small pieces because he wanted to dedicate himself to his teaching.

Night Soliloquy is one of Kennan's most famous pieces. Many major orchestras throughout the country have performed the piece. It is considered a staple of the flute repertory. Preparing this piece was a challenge for me because I have never had to memorize any of my music before. I began working on this piece last semester to have it ready for the Albion College concerto competition in February 2006. I have really enjoyed the challenge this piece has presented and look forward to performing it in the Concerto Concert on April 30 with the Albion College Symphony Orchestra.

ARIELLE CARTER, '08

Socio-economic Causes of Child Labor in Urban Nigeria

Faculty Sponsor: 'Dimeji Togunde

Major: International Studies
Hometown: Grand Rapids, Mich.

This research examines the causes of child labor and how child labor varies by parental socio-economic status in urban Nigeria. Drawing on interviews with 1,535 children (aged 8 to 14 years), we affirm that a study of the relationship between parental socio-economic status and child labor is crucial to an understanding of the roots of child labor at the household level. The uniqueness of our study lies with the richness of the data that introduce two new measures of child labor—child's ownership of business and control over earnings—to supplement the conventional use of child's hours of work. Our findings offer strong support to the poverty hypothesis and the socialization theory, which have been routinely used to explain child labor in developing societies. Furthermore, our results indicate that children of parents with higher levels of socio-economic status work fewer hours. Evidence also shows that children of parents with higher socio-economic status are more likely to own their businesses rather than assisting parents. Those children are also more likely to keep and spend their work earnings. The findings have implications for regulating child labor and alleviating its consequences.

Supported by: FURSCA

SARAH CARVER, '06

A Shortened Molecular Method for Undergraduate Detection of Fecal Coliforms in Environmental Samples

Faculty Sponsor: Douglas White

Major: Biology
Hometown: Albion, Mich.

Although pathogens occur in low amounts, fecal contamination of water can endanger the health of citizens. Detection of pathogenic bacteria can be difficult so fecal coliforms, synonymous with *Escherichia coli,* are used as indicators of contamination due to their naturally high presence in fecal matter. Undergraduates have traditionally learned to distinguish and quantify *E. coli* by utilizing selective media with confirmation possible in 48 hours. Fluorescence in-situ hybridization (FISH) is a rapid, sensitive, and versatile technique available for a wide range of microbiology studies. Seldom is the method used in an undergraduate microbiology laboratory because of equipment and time limitations. FISH employs an oligonucleotide, a short piece of DNA, to fluoresce a whole cell; the oligonucleotide can be specific for a phylogenetic group, species, or even a strain of bacteria. Unlike traditional aquatic bacteriology tests, FISH can be completed within a few hours.

With this goal in mind, two previously published FISH protocols were adapted to form a new FISH technique. In this method, a new oligonucleotide was designed, ECO1018, that specifically targets *Escherichia coli* nucleotide positions 1018-1036 in the 16S ribosomal RNA. After completion of FISH on *E. coli* and *Enterobacter aerogenes*, the negative control, only *E. coli* cells were detected with ECO1018; the new oligonucleotide demonstrated high specificity for *E. coli.* The entire procedure can be accomplished in 90 minutes, allowing for the incorporation of FISH into an undergraduate microbiology laboratory.

Supported by: FURSCA-Bethune Fellowship, Faculty Development Committee

STEPHANIE CLARK, '06

Major: Biology
Hometown: Port Huron, Mich.

WENDY SIMANTON, '07

Major: Biology
Hometown: Niles, Mich.

Netrins: Creating Divergent Axon Morphologies

Faculty Sponsor: Molly Scheel

Clark

Simanton

During embryonic nervous system development, axons must grow and make proper connections with targets within the body. This process is referred to as pathfinding and is regulated by secreted guidance molecules, many of which are conserved among a variety of organisms, including humans. In this project, we are interested in examining the guidance molecule, netrin, and how this protein regulates the development of divergent nervous systems. In insects and in some crustaceans, such as the malacostracan *Parhyale hawaiensis*, commissural axon tracts are established prior to the longitudinals. However, we have noted that the longitudinal axon tracts are established prior to commissural axon growth in several branchiopod crustaceans, such as the brine shrimp *Artemia franciscana.*

This observation led us to hypothesize that changes in the expression of the netrin gene may be responsible for such differences. To investigate this idea, the *Artemia franciscana netrin (afrnet)* gene was cloned. An antibody to the *afrnet* protein was generated and used to elucidate a novel pattern of netrin expression in *Artemia.* This antibody was also found to cross-react to netrin proteins in other insect and crustacean species, a fortunate discovery that has allowed us to efficiently study netrin expression patterns across arthropods. Our findings indicate that the changes

in netrin expression patterns observed in *Artemia* are conserved among branchiopods. Such changes have likely contributed to the divergent mechanism of nerve cord formation observed in branchiopod crustaceans. This research has enhanced our understanding of nervous system development and provided insight as to how divergent neural circuitry patterns have evolved.

Supported by: FURSCA-Kresge Fellowship (Clark), FURSCA-Gardner Fellowship (Simanton), National Institutes of Health, Blanchard Foundation, Foundation for Interdisciplinary Study, Faculty Development Committee

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DAYNA CLELAND, '08
Majors: Anthropology, Spanish
Hometown: Birch Run, Mich.

ALLISON GESSNER, '08
Major: Music Performance
Hometown: LaGrange, Ky.

Concerto à Cinque in G Major, Opus 9, No. 6, by Tomaso Albinoni

Faculty Sponsors: James Ball, Rebecca Van de Ven

Cleland

Gessner

Tomaso Giovanni Albinoni (1671-1751) was never engaged as a court composer, unlike most composers at his time. He was an accomplished violinist and singing coach, and married to an opera diva. Albinoni wrote 24 oboe concerti, one in each key, some for two oboes, and some for one. Unlike Vivaldi and his Venetian counterparts who typically composed as if substituting the solo oboe for the solo violin, Albinoni composed more lyrical concertos that have been compared to operatic arias. Albinoni's Concerto in G Major for two oboes, strings, and basso continuo is one of his second set of twelve. In this set of concerti, he models the concerti for two oboes on those for one, and expands the layers of sound more than he had in his earlier oboe concerti.

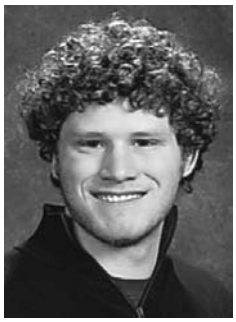
As oboists at Albion College we are unique, and we have banded together for support, and become very close. We have always enjoyed playing together. In the fall of 2005 we began seriously considering doing a duet and auditioning for the Concerto competition in February. Albinoni's concerti for two oboes were suggested as possible pieces for us to use in the competition. We had a few to choose from, and felt that the concerto in G Major did a good job of highlighting our individual talents. Once we had chosen the piece, we began weekly rehearsals with each other focusing on musicality and memorization. This duet concerto has been a unique and challenging experience for both of us, and has helped us grow as musicians and friends. We are looking forward to performing this concerto on April 30 with the Albion College Symphony Orchestra.

BRENT CLORE, '06

Why We Protect Virtual Child Pornography: An Analysis of the Child Pornography Protection Act of 1996 and *Ashcroft v. Free Speech Coalition*

Faculty Sponsor: William Rose

Majors: Philosophy, Political Science
Hometown: Jackson, Mich.



In 1996, a Congressional committee proposed the Child Pornography Protection Act (CPPA). One of the most controversial parts of the legislation stated that the production, sale, or possession of "any picture" that "is, or appears to be, of a minor engaging in sexually explicit conduct" is punishable by law. The act also prohibits any sexually explicit image that is "advertised, promoted, presented, described, or distributed in such a manner that conveys the impression" it depicts "a minor engaging in sexually explicit conduct." This means that under the CPPA any material produced to appear as child pornography finds no protection under the First Amendment, even when no actual children were used in the making of the material (referred to as virtual child pornography).

This legislation was challenged in the courts all the way to the 2002 Supreme Court case *Ashcroft v. Free Speech Coalition.* The Supreme Court ruled that the CPPA was unconstitutional in that it was overbroad in attempting to proscribe speech that passes traditional free speech tests. What is particularly interesting about the CPPA and *Ashcroft* is that both the government and the Supreme Court drew upon the same model of First Amendment jurisprudence, but came to very different conclusions. An analysis of two competing models of free speech—the "liberty" model and the "marketplace" model—in light of *Ashcroft* and the CPPA will show why I believe the court majority correctly applied the marketplace model in ruling that virtual child pornography, as a class of speech, deserves constitutional protection.

AUDREY COLEMAN, '06

'The Butch' and 'The Bitch': Heteronormativity in *The Birdcage* and *Brokeback Mountain*

Faculty Sponsor: Margaret Young

Major: Theatre
Hometown: Plymouth, Mich.

If it is true that popular culture teaches and reproduces mainstream values, then critical examination of popular culture is an effective tool to evaluate current standards of normativity.

Ten years ago, the film, *The Birdcage,* presented Americans with a heteronormative image of gay relationships. In the film, two men (biologically defined) negotiated their romantic relationship by performing the roles of a gendered man and a gendered woman. This depiction suggests that the most fundamental definition of a 'normal' romantic relationship is a dichotomous pair in which one party is dominant. Gender differentials are an expression of this dichotomy, and therefore are present in romantic relationships even when sex differentials are not.

Recently, the film, *Brokeback Mountain,* presented Americans with another image of gay relationships. Some critics argue that

Brokeback Mountain embraces homosexuality. I, however, argue that the gay relationship in *Brokeback Mountain* expresses the same gender/power dichotomy present in *The Birdcage*. The difference is only the subtlety with which this dichotomy is expressed.

NATALIE CORBIN, '06

"Standing on the Midway: A Poetic Sequence"

Faculty Sponsor: Helena Mesa

Majors: English (Creative Writing), German
Hometown: Kalamazoo, Mich.

When the Bally-Shouter invites you to step right up and enter his booth on the circus midway, he is inviting you to enter another realm of reality and to reconsider how you define natural or normal. You enter a world of the extraordinary. We are captivated by otherness, and throughout human history, those born different have been singled out and displayed. From the opening of P.T. Barnum's first dime museum of human and natural wonders, until the closing of the last traveling sideshow in 1956, circus sideshows and dime museums were a primary source of entertainment and fascination in the Western world. Promoters of sideshows constructed a world that was seemingly more exotic and thrilling than the so-called "normal" world outside the show.

I am inspired by the idea of otherness and the construction of another world, where nothing is quite what it seems, and I have wanted to offer my own narratives and interpretations of this alternate reality. These themes appear in much of my poetry. This creative thesis consists of a sequence of poems centered on the circus sideshow and its performers. Through the dramatic monologue, I attempt to create the voices of those who never had one, or whose own side of the story has rarely been told.

Supported by: FURSCA

AMANDA CROSS, '06

Five Months of "Mate"

Faculty Sponsor: Kalen Oswald

Major: Spanish
Hometown: St. Paul, Minn.

Traveling abroad can be an extremely frightening yet very enlightening life experience, especially when a person is completely immersed in the local culture. In fall 2005, I totally submerged myself in the Argentine culture for five months by living with a host family and attending a local university in Córdoba, Argentina. During this time I learned a lot about the Argentine people and their customs as well as the diverse geography of Argentina through my travels within the country. Throughout the period of time before, during, and after my adventures in Argentina, I kept a journal. From this journal, I selected different anecdotes and thoughts to mix with my extensive research of Argentine history, popular culture, and my knowledge of the Spanish language in order to compile a series of short stories, poems, and essays that make up my thesis.

Supported by: FURSCA

ZACHARY DAGNEAU, '06

Engineered Destruction: Environmental Disaster and Dissent in the USSR

Faculty Sponsor: Geoffrey Cocks

Major: History
Hometown: Traverse City, Mich.

Central Asia is home to the worst environmental disaster the world has known. Between the former Soviet Central Asian Republics lies the evaporating Aral Sea. The Aral was once the fourth largest freshwater lake in the world and home to twenty unique fish species which supported a thriving commercial trade. However, the Aral was sacrificed for the economic gains of the former Soviet Union. The sea's two tributaries were increasingly choked off to irrigate a sweeping cotton monoculture in the arid desert steppes of the region. The story of the Aral Sea is of the excesses of the Soviet centrally planned economy.

There is another aspect of this disaster that is less well known, that of the existence of a group of motivated, organized, and dedicated nature protection activists with a long tradition of service and study in Russia. The nature protection movement can trace its roots to pre-revolutionary Russia and was quietly active throughout the Soviet period. In the late 1960s the environmental movement would take up the cause of the Aral Sea in what would become a show-down with the Soviet state.

Supported by: FURSCA

SPENCER DAWSON, '06

Social Dominance Orientation, Right-Wing Authoritarianism, and Similarity Effects in Biracial Elections

Faculty Sponsor: Mark Walter

Majors: Psychology, Political Science
Hometown: Ann Arbor, Mich.

Racial similarity bias is one reason Caucasian-American candidates often defeat African-American candidates in elections. It was hypothesized that similarity bias would be most prevalent in prejudiced individuals, causing them to think more positively toward and vote for a racially similar candidate. Right-Wing Authoritarianism (RWA) and Social Dominance Orientation (SDO) have both been found to be correlated with high levels of prejudice toward many different out-groups, including African-Americans.

A sample of Caucasian-American college students (n = 55) and members of a small Midwest community (n = 45) completed a questionnaire that began with a hypothetical election. Pictures and written descriptions of middle-aged African-American and Caucasian-American men represented the two gubernatorial candidates. Participants completed a rating scale for each candidate, "voted," completed an RWA scale and an SDO scale, and then indicated their age, sex, and race. A measure of racial bias was created by comparing the ratings of the two candidates, such that a positive score indicated bias in favor of the Caucasian-American candidate.

Both the student and community samples rated the African-American candidate more favorably than the Caucasian-American candidate and voted more often for the African-American than the Caucasian-American. In the community sample, SDO was found to have a positive correlation with racial bias. A positive correlation was found in the community sample between RWA and racial bias. No correlation between racial bias and RWA or SDO was found in the student sample. These results support the similarity bias hypothesis in a community, but not a student sample.

Supported by: FURSCA

LAUREN DOWNHAM, '06

Perceptions of Aging and Recovery from an Acute Event

Faculty Sponsor: Mary Jenson

Major: Psychology
Hometown: Olivet, Mich.

Successful recovery from an acute illness is a complicated process, particularly in elderly individuals. One area of concern is how one's perceptions of aging may influence one's recovery following an acute illness or event. We hypothesized that individuals with a more positive view of aging would have a more successful recovery trajectory than those individuals who held a more negative view of aging. Participants were recruited at one of several sub-acute care facilities. Patients were considered eligible to participate if they had been admitted for rehabilitation, were over age 55, planned to be discharged to the home, and had no cognitive impairments. Participants were initially approached by a member of the research team who explained the purpose and the procedures of the study during the first few days of their stay at the care facility. Patients then completed several questionnaires (e.g., Perceptions of Aging Scale and a physical status questionnaire). They were then contacted biweekly to gauge their current level of physical functioning. The data were analyzed in a 2 (perception of aging) x 4 (time of measurement) mixed model ANOVA. The results suggest that patients increased their level of physical functioning over time ($p < .001$). However, this finding was qualified by an aging perception and time interaction. Participants with more positive perceptions of aging reported significantly greater increases in physical functioning ($p < .01$) than those with more negative perceptions ($p <$ ns). In conclusion, these findings support our hypothesis that one's perceptions of aging can influence physical recovery.

Supported by: FURSCA, Faculty Development Committee

ANDREW FIDLER, '08

Majors: Chemistry, Physics
Hometown: Rochester, Mich.

KATIE RIEPEN, '09

Major: Chemistry
Hometown: Milford, Mich.

Photophysics of Cinnamic Acid Derivatives

Faculty Sponsor: Craig Bieler

Fidler

Riepen

Cinnamic acid and its derivative compounds have been used as matrices for various laser desorption/ionization techniques. In an attempt to understand the utility of these compounds for this technique, traditional spectroscopic measurements were used to study the absorption and emission properties of a series of these compounds. UV/Visible spectroscopy measures the ease with which the molecule absorbs light at specific wavelengths, whereas fluorescence spectroscopy measures the amount of energy that is lost by the molecule via light emission after light absorption. A trend in the absorption cross section and fluorescence efficiency based on functional group identity and position helps unravel the details of energy transfer within these molecules. We will report, for a series of compounds, absorptivity values and fluorescence quantum yields for absorption by these compounds at 337 nm, the most common laser wavelength used in the desorption techniques.

Supported by: Student Research Partners Program

MEGAN FITZPATRICK, '08
Major: Biology
Hometown: Marshall, Mich.

ASHLEY GARDNER, '07
Major: Biology, Neuroscience Concentration
Hometown: Kalamazoo, Mich.

Nest Structure, Incubation, Egg Viability, and Sex Ratio in Tree Swallows in Whitehouse Nature Center

Faculty Sponsors: E. Dale Kennedy, Douglas White

Fitzpatrick

Gardner

Factors that contribute to clutch size (number of eggs laid) and egg hatchability play major roles in the breeding success of birds. One such factor may be temperature in eggs laid prior to the onset of incubation. The egg viability hypothesis suggests that in warmer climates, high ambient (environmental) temperatures may cause eggs to begin developing before incubation begins. Such early development may cause abnormalities and lead to hatching failure. We tested the egg viability hypothesis in tree swallows (*Tachycineta bicolor*) at Whitehouse Nature Center in summer 2005. We used IButtons™ to record temperatures in nests with eggs and nestlings. Swallows add variable numbers of feathers as nest insulation. We examined the relationship between feather quantity, temperature records, and breeding success. We hypothesized that egg order would affect hatching, with early eggs laid in a clutch less likely to hatch than later eggs. Unhatched eggs occurred in 16 of 36 nests, and in all of those 16 nests, ambient temperatures had fluctuated above 24° C (the temperature at which eggs may begin developing). Our results, however, suggested that later-laid eggs were less likely to hatch, as the ultimate or penultimate egg (or both) did not hatch in 10 of 16 (63%) nests. Previous studies have suggested that birds may alter sex ratios in clutches based on differences in rearing conditions. Based on DNA collected from blood of nestlings, sex ratio did not differ significantly from 1 male:1 female ($X^2 = 1.15$, df = 1, P = 0.283).

Supported by: FURSCA, A.M. Chickering Professorship in Biology (Kennedy)

CATHERINE FONTANA, '08
Majors: Biology, English
Hometown: Dearborn, Mich.

CAMERON HARRIS, '08
Majors: Psychology, Biology
Hometown: Portage, Mich.

Simulation of Parasitism in *Armadillidium vulgare*

Faculty Sponsor: Dean McCurdy

Fontana

Harris

The parasite manipulation hypothesis is a generally accepted belief among parasitologists that some parasites are able to change the behavior of their hosts through a variety of methods. Understanding these complex interactions, however, requires separating the behavior caused by the host responding to the infection (host response) and the parasite's true altering of the host (parasite manipulation). The teasing apart of these systems, however, has not been possible or has not been attempted, mostly due to their complexity and often microscopic scale. In an attempt to help understand this distinction, this experiment examines a simulated infection in the common acanthocephalan-isopod parasite system.

In this study, a 1mm glass bead was injected into the body cavity of the terrestrial isopod *Armadillidium vulgare*, commonly known as the pill bug. The location and size of this bead approximates the cystocanth stage of the parasite *Plagiorhyncus cylindricus* which has been shown to alter behavior in its host. Behavioral changes in the simulated infected animals were examined with regards to light/dark, shelter, humidity, and substrate preference as well as feeding, growth, and locomotion. By comparing these changes to well-documented changes seen in past studies of true acanthocephalan infections in isopods, insight into the source of these changes can be gained. Similarly, serotonin injections were used to test the hypothesis that secretion of this neurotransmitter by the parasite is the mechanism by which behavior is modified. The same behavioral tests were run comparing serotonin and no serotonin within the infected and simulated infected isopods.

Supported by: FURSCA

JAIME FORNETTI, '06
(See Ashley E. Alker, '06, Jaime Fornetti, '06)

DANIELLE FOWLER, '06

adolescent_lit@the-millennium

Faculty Sponsor: Ian MacInnes

Major: English
Hometown: Dearborn, Mich.

In exclaiming to Alice, "Tut, tut, child! Everything's got a moral, if only you can find it," Lewis Carroll's Duchess presents a commonly held belief in our culture that children's literature should be simple, straightforward, and didactic. However, some contemporary authors of young adult literature are challenging this stereotype and taking their work in a new direction, based on quite different ideas about what children can and cannot handle.

Children in today's culture, sometimes called the Millennial Generation, are integrating technology into their daily lives in a way that most adults are unable to imagine, or are unwilling to acknowledge. In this thesis, I approach the changing world of young adult literature from a technological standpoint. I utilize two areas of academia, the study of the "postmodern children's book" and the emerging field of New Literacy Studies, to discuss the increasingly prominent role of technology in adolescent literature and its broader signifi-

cance to the genre as a whole. I analyze three individual adolescent novels and a popular young adult series with respect to narrative, character, and technological content. These books are just a small sampling of a larger pool of literature, but they serve as excellent examples of the shift from a stereotypical Victorian attitude toward children and young adult literature to a less restricted, contemporary approach.

ASHLEY GARDNER, '07

(See Megan Fitzpatrick, '08, Ashley Gardner, '07)

SARAH GEBHARDT, '06

Children and Race

Faculty Sponsor: Barbara Keyes

Majors: Psychology, Music
Hometown: Grand Rapids, Mich.

Stereotype adherence in children was studied using two research tools, a forced-choice computer game and the Multi-response Racial Attitude Measure (MRA) (Doyle & Aboud, 1995). Children from a small, racially homogenous (Caucasian) Midwestern elementary school participated in this study. Participants were a sample of kindergarten through fourth grade students (N = 88). The MRA asked the participants 24 questions, such as "Who is polite?" and "Who teases other children?" and then participants responded to a white, biracial, and black silhouette. The computer game consisted of 10 questions such as "Which child dropped the books?," and participants were then presented with a black child, a biracial child, and a white child from which they could select only one child as their answer. Half of the children were tested by a white administrator and half by a black administrator. These results were interpreted in terms of social cognitive developmental theory. Preliminary results indicated that there was a significant interaction between grade and target on the computer game and a significant main effect of target on the MRA. T-tests suggested that a shift in response patterns may occur between second and third grade. The findings suggested that in-group favoritism peaks in second grade and begins to decline thereafter. Moreover, these results revealed that race of examiner did not influence children's responses on either task.

Supported by: FURSCA

DAVID GEER, '08

The Hijra and Kothi Sex Workers of India: A Fight for Civil and Human Rights

Faculty Sponsor: Trisha Franzen

Major: Feminist and Identities Studies
Hometown: Taylor, Mich.

This study focused on the ways in which social constructions affect transgender persons and individuals with gender identities outside of forced, socially constructed gender binaries and/or identities. My readings and research focused on these individuals within the West, India, and Thailand. For the symposium, my presentation is based on an aspect of my research—which was often limited to secondary, Western texts and primary personal narratives—that focused heavily on the fight for civil and human rights by the Hijra and Kothi sex workers of India. This fight also includes organizations not originally formed by a Hijra or Kothi individual. "Hijra" and "Kothi" are labels for broad identities that actually contain a large diversity of "non-normative" or "non-mainstream" gender and sexual identities and roles. Many of the Hijras and Kothis face large amounts of gender and sexual oppression, violence, police brutality, and poverty. These acts of "othering" and silencing are often argued to be worse for those individuals who are also sex workers. This presentation will also acknowledge the way I am positioned in relation to these experiences entrenched in identities; I will not be giving a critique or critical analysis of Hijra or Kothi identities because I am not positioned to do so. Thus, the presentation is obviously biased in the way that it is pro-transgender and pro-genderQueer and based on creating awareness about the oppression Hijras and Kothis face.

Supported by: FURSCA

ALLISON GESSNER, '08

(See Dayna Cleland, '08, Allison Gessner, '08)

JAIME GONSLER, '07

Adhesive Seed Dispersal by Bison of the Konza Prairie

Faculty Sponsor: Sheila Lyons-Sobaski

Major: Biology
Hometown: Clinton Township, Mich.

Seed dispersal is the method by which a plant distributes its offspring away from a parent plant. Dispersal away from a parent increases the chance that the offspring will arrive at "safe sites" that favor offspring survival. The attachment of seeds using devices such as hooks, barbs, or sticky substances to traveling dispersal agents is one of the many methods that plants use to disperse seeds. We investigated adhesive seed dispersal on the bison of the Konza Prairie Research Natural Area in the Flint Hills of Kansas by surveying seed abundance and diversity in bison hair samples taken during an annual round-up. Because the structure of bison hair varies depending on the location on the body (head, shoulder, and rump), we investigated how adhesive and non-adhesive seeds attach to each region. Hair on the head is long, thin, and coarse, while on the shoulder, hair is softer and of medium length. Hair on the rump is very short, dense, and soft. Our results suggest three findings. Adhesive seeds are more abundant on bison than non-adhesive seeds. Hair on the head of bison traps seeds more effectively than hair on the rump and shoulder of the bison. And last, the head has the highest species richness although the shoulder has the highest species diversity relative to species abundance.

Supported by: FURSCA

DAVID GOODYEAR, '07

Within-Subject Comparison of Appetitive Delay and Trace Pavlovian Conditioned Inhibitors in the Rat: Effects of Scopolamine

Faculty Sponsor: W. Jeffrey Wilson

Major: Biology
Hometown: Perry, Mich.

Delay and trace excitatory Pavlovian conditioning has received much attention since the realization that their neural substrates differ, with the cerebellum controlling delay conditioning while trace additionally requires the hippocampus. Delay and trace inhibitory conditioning has received little attention, perhaps because of the conundrum of defining the trace period. In excitatory conditioning, the trace period is defined as the period of time from the offset of the conditioned stimulus (CS) to the onset of the unconditioned stimulus (US), i.e., the time during which the memory trace of the CS must be maintained. In trials involving a conditioned inhibitor (CI), the US is not presented. Is the trace period the time from the offset of a CI until the time when the US would have been presented on an excitatory trial? We chose to define the inhibitory trace period in this manner, and compared acquisition of a trace CI with a delay CI (a CI terminating at the time when the US would have been presented). Both trace and delay CIs were readily acquired. We then found that scopolamine, in doses ranging from 0.125 mg/kg through 0.625 mg/kg, increased responding overall but did not differentially affect conditioned responses in either excitatory or inhibitory trials.

Supported by: FURSCA, Psychology Department

DAVID GOODYEAR, '07

Does the Source of DNA Matter? A Comparison of DNA from Feathers and Blood of Nestling House Wrens and Tree Swallows

Faculty Sponsor: E. Dale Kennedy

Major: Biology
Hometown: Perry, Mich.

Recent advancements in molecular biology have led to an increase in the number of methods available for obtaining DNA from birds. Ornithologists are progressively more interested in avian DNA for studies of sex ratios, paternity, phylogeny, and fingerprinting. The two most commonly used sources of avian DNA are blood and feathers. The use of blood as a source of DNA for these studies has a variety of potential problems regarding collection, handling, and storage. Concerns about exposure to avian blood have increased recently with the introduction of West Nile virus. Feathers, on the other hand, are more easily collected, less intrusive to take than blood, and can be stored indefinitely at room temperature.

I compared concentration and purity of DNA collected from nestling house wrens (*Troglodytes aedon*) and tree swallows (*Tachycineta bicolor*) in order to determine the best source of DNA. The preliminary data from this study show that the blood collected from tree swallows had an average DNA concentration of 34.9 µg/ml and a purity ratio of 1.77 (where 1.8 is completely pure DNA), while the feathers collected had an average DNA concentration of 30.6 µg/ml and a purity ratio of 1.81. In comparison, the blood collected from house wrens had an average DNA concentration of 41.7 µg/ml and a purity ratio of 1.76, while the feathers had an average DNA concentration of 20.18 µg/ml and a purity ratio of 1.62. The average DNA concentrations from blood among all specimens and both species were higher than average DNA concentrations from feathers, and although there was more variance in DNA collected from feathers, especially from house wrens, both feathers and blood provided sufficient DNA for sexing nestlings.

Supported by: FURSCA

BETHANY GOZDZIALSKI, '06

Change in Water Depth from 1971 to 2005 in Albion's Lower Millpond

Faculty Sponsor: Christopher Van de Ven

Major: Geology
Hometown: Clarkston, Mich.

The upper and lower millponds in Albion, Michigan were dredged in the early 1970s. Since the dredging, there has been no additional surveying to see if the millponds are filling up with sediment. In the fall of 2005, the depth of the lower millpond between Superior Street and Riverside Drive adjacent to Victory Park was surveyed using a depth finder. Depth measurements were taken every 20 feet across the lower millpond and each row of measurements was taken approximately 100 feet apart. Using a geographic information system (GIS), the 2005 data were compared to depth measurements collected in 1971 prior to dredging in the early 1970s. Results showed that 57,218 m^3 of silt was removed from the lower millpond. Over 39,622 m^2 (94% of the total area) of the millpond experienced an increase in depth, with 2,234 m^2 (5%) experiencing a decrease in depth, and 1% of the millpond having no change. The amount of sediment in the lower millpond in 2005 was insignificant, indicating that the pond is not filling with sediment.

Supported by: Geological Sciences Department Alumni

MIRANDA GREEN, '06

Beauty Is Only Skin Deep

Faculty Sponsor: Gary Wahl

Major: Art and Art History
Hometown: Chase, Mich.

The objective of my research has been to explore and transform perceptions of the human body through the framing and focus of my camera lens: not altering the body, but revealing what has always been there from my perspective. Through carefully chosen angles, lighting, framing, and focus, photography allows me to reframe the typically ignored areas of the body to reveal them as abstract displays of beauty. Scars, wrinkles, and pores all have a story that is unique to each individual. As these aspects of the body are separated from the individual, they become metaphors of human life. This process of abstraction reduces the human form to the point where it can be seen more as textures and patterns, removing the negative connotations society has placed on such aspects of the body.

One of the biggest transformations I have encountered has come from hearing my models' and participants' views being changed through the abstraction process. Their stories range from mere acceptance of my project to actually altering their view toward their own body. Their transformed perceptions drive the continuation of this work and its expansion to include the consideration of its effects on the subjects. They are now able to see their imperfections in a different light and embrace their own body as being beautiful. By allowing my viewers a new lens through which to see the human body, I hope to be able to start deconstruction of the beauty constraints placed on individuals of the twenty-first century.

HEATHER HANDLON, '06

Standing at the Crossroads of the Environmental Crisis: Rediscovering Thoreau, Muir, and Leopold

Faculty Sponsor: Wesley Dick

Major: History
Hometown: Clinton Township, Mich.

In 2006 there is consensus among scientists that we face an environmental crisis on planet Earth, stemming from human ignorance and arrogance concerning nature. Humankind is standing at a crossroads. Can the crisis be resolved or reversed?

This study explores how enlightenment and modern values defining progress have shaped human attitudes and behavior concerning the environment, contributing to the crisis, and how alternative perspectives have offered paths toward a more harmonious relationship with nature. Henry David Thoreau, John Muir, and Aldo Leopold are prominent among those visionaries who have questioned such progress. They have seen human salvation in wilderness and nature. The purpose of this research is not prescriptive, but it does explore our options.

In America, the answer is usually more progress. But, what is the question? The environmental prophets highlighted in this study asked hard questions about the assumptions of the modern age. One hope for countering the environmental crisis is the rediscovery of their wisdom.

Supported by: FURSCA

CAMERON HARRIS, '08

Affective Reactions to Affluence Acquisition: The Mediating Effects of Perceived Conscientiousness

Faculty Sponsor: Andrew Christopher

Majors: Psychology, Biology
Hometown: Portage, Mich.

To examine the effect of affluence source on affective reactions of observers, 382 Americans read one scenario that depicted either a man or a woman in one of six home settings: less affluent, affluent (source of affluence unspecified), affluent via promotions, entrepreneurial success, inheritance, or gambling success. Participants indicated envy, resentment, and pleasure felt for the scenario character, as well as how deserving the character was of his or her lifestyle. Multivariate analyses of variance and subsequent tests revealed that participants were particularly resentful of affluence acquired via inheritance or gambling success. In addition, participants felt pleasure for individuals who earned promotions, and believed individuals who earned promotions or experienced entrepreneurial success were deserving of their affluent lifestyles. Perceptions of conscientiousness fully mediated how source of affluence affected feelings of resentment, and such perceptions partially mediated how source of affluence affects feelings of pleasure and judgments of deservingness.

CAMERON HARRIS, '08

The Effect of Alcohol on Jet Lag Recovery in the Diurnal Rodent, *Octodon degus*

Faculty Sponsor: Tammy Jechura

Majors: Psychology, Biology
Hometown: Portage, Mich.

Circadian rhythms are an important aspect of mammalian biology, mediating daily fluctuations in body temperature, activity, and other bodily functions. The onset of a typical circadian rhythm is mediated by environmental factors including light:dark cycle, social

interaction, some food cycles, temperature, and other factors. When a radical change in timing of environmental stimuli occurs, circadian rhythms become desynchronized. In humans, travel across time zones causes the phenomenon of "jet lag." Influences on jet lag recovery (known as phase shift reentrainment) have been studied at length and include the use of olfactory cues, exercise, light, and pharmacological treatments.

Alcohol has been shown to have a significant impact on circadian rhythms by affecting body temperature and disrupting normal expression of the per gene. While alcohol's interaction with body temperature has been widely studied, the effect that consumption has on reentrainment remains unclear. In recent studies, an excellent animal model for circadian research has emerged, the *Octodon degus*. Unlike most rodents, the degu is diurnal and shows many circadian rhythm similarities to humans. Circadian rhythm research has shown the degu to be an effective and responsive model for the study of reentrainment. In this study, degus were used to examine alcohol's influence on reentrainment after a six-hour phase advance of the light:dark cycle. Data representing the length of time to reentrain following the phase shift in the presence and absence of alcohol ingestion will be presented. Circadian rhythms will be represented through changes in body temperature and activity rhythms as a result of alcohol consumption.

Supported by: FURSCA

CAMERON HARRIS, '08

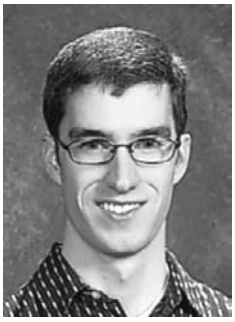
(See Catherine Fontana, '08, Cameron Harris, '08)

DANIEL HARRIS, '06

Global Transcriptional Regulation of Iron-Responsive Genes in *Shewanella oneidensis* MR-1

Faculty Sponsor: Ruth Schmitter

Major: Biology
Hometown: Bloomfield Hills, Mich.



Iron is an essential micronutrient for both prokaryotic and eukaryotic organisms. In addition to structural roles in proteins, the iron redox potential makes iron a useful cofactor for proteins, functioning in respiration, electron transport, photosynthesis, nitrogen fixation, DNA biosynthesis, and other important processes. Accumulation of free Fe(II) will induce iron toxicity by producing highly reactive oxygen species; thus, most bacteria moderate iron acquisition and use through the ferric uptake regulator (Fur), an iron-responsive global transcriptional factor.

In the present study, DNA microarray technology was used to characterize the iron response network in the dissimilatory metal-reducing bacterium *Shewanella oneidensis* MR-1, and in a *fur* deletion mutant derived from MR-1. Cells were harvested at various intervals after addition of an iron chelator (2,2'-dipyridyl), and then after iron repletion with iron sulfate ($FeSO_4$). Total RNA was extracted from each strain at thirteen time intervals, reverse transcribed, fluorescently labeled, and hybridized to DNA microarray slides. Quantified microarray data were analyzed using a novel method based on Random Matrix Theory (RMT), which was employed to construct regulatory gene co-expression networks. The results confirmed previous findings implicating Fur as a pleiotropic transcriptional regulator of genes involved in iron acquisition and storage (SO3032, hugA, ftn), energy metabolism (such as TCA enzymes acnA, adhA, icd), and other functions. Analysis of co-expression networks identified a dozen transcriptional regulators that are co-regulated with genes in anaerobic energy transport. Understanding regulatory pathways and co-expression networks might elucidate specific pathways in metal reduction, leading to the use of *S. oneidensis* as a bioremediation agent of metal-contaminated sites.

Supported by: Student Undergraduate Laboratory Internships (SULI) Program, Office of Science, U.S. Department of Energy. This research was conducted at Oak Ridge National Laboratory under the guidance of Yunfeng Yang and Jizhong Zhou.

ANDREW HASLEY, '07

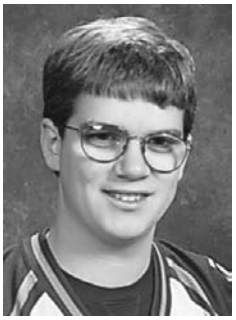
Major: Biology
Hometown: Grand Junction, Colo.

BRANDON HILL, '07

Majors: Biology, French
Hometown: Plymouth, Mich.

Phylogenetic Analysis of Netrin Genes

Faculty Sponsor: Molly Scheel



Hasley

Hill

This study examines developmental genes cloned from *Artemia franciscana* (sea monkey). Genes recently cloned from *Artemia* were analyzed online using BLAST and ClustalW to identify the sequences and compare them with previously identified genes of the netrin and laminin gene families, genes that regulate nervous system development. Gene alignments generated in ClustalW were further analyzed with two software programs, Phylip and PAUP, which allowed for the creation of phylogenetic trees. Based on analyses of these trees, which show relationships between protein sequences, it was determined that one clone's sequence associated with netrin genes. This gene was subsequently named *Artemia franciscana netrin-1 (afrnet-1)*. Another clone's sequence was more similar to laminin genes in phylogenetic trees, and this clone was named *Artemia franciscana laminin-1 (afrlam-1)*. These data are important because the changes in the netrin

gene in different species suggest information about evolution. Furthermore, by comparison with other species, these findings allow a better understanding of the netrin gene's role, structure, and importance.

Supported by: FURSCA, National Institutes of Health, Foundation for Interdisciplinary Study

BRANDON HILL, '07

(See Andrew Hasley, '07, Brandon Hill, '07)

HEATHER HOROBIK, '06

Exploring the Intricacies of Archaeological Site Surface Survey: A Case Study of Körösladány 14

Faculty Sponsor: Laura Villamil

Majors: Anthropology, History
Hometown: Benkelman, Neb.

Archaeological surface survey is a useful tool for understanding the past. However, the accuracy of surface artifacts to reflect the site below the surface has been questioned. If the surface materials mirror the subsurface site, then the patterning of surface artifacts would give archaeologists helpful insights about the site. Using survey data obtained from the Hungarian Copper Age site of Körösladány 14 (K-14) during 2005, I evaluate the uses, limitations, and results of archaeological site surface survey. By combining the survey data with spatial information, I created a geographic information system (GIS) database to map the density and distribution of surface artifacts and to predict the subsurface site. The predictions were then compared to results from both magnetometry and 2005 excavations. In discussing the advantages and disadvantages of using surface survey for the K-14 site as well as the limitations of archaeological survey in general, I conclude that the surface data does not reflect perfectly the site below ground. Site survey raises many questions that can only be answered through other means (e.g., excavation). Therefore, survey should not be used in isolation but rather as a starting point when considering whether and how to explore a site.

Supported by: National Science Foundation Research Experiences for Undergraduates. This research was conducted under the guidance of William Parkinson, Richard Yerkes, and Attila Gyucha in Vészto, Hungary as part of the Körös Regional Archaeological Project.

AMY HUPP, '06

Do Abiotic Factors Affect Diel Movements of Adult Nurse Sharks, *Ginglymostoma cirratum*, in the Dry Tortugas (Florida) Reproductive Refuge?

Faculty Sponsor: Jeffrey Carrier

Major: Biology
Hometown: Clinton Township, Mich.

Nurse sharks begin mating in mid-June each year in the Dry Tortugas (Florida) island chain. In addition to the physiological changes that prepare them for mating, other factors are believed to influence the onset of reproductive behaviors. Some of the most influential abiotic factors are believed to include water temperature and moon phase along with tidal fluctuations. Additionally, the amount of dissolved oxygen and the associated changes in barometric pressure may provide clues as to why the tagged community of nurse sharks returns seasonally to mate during this specific time interval.

Data were collected over two, two-week periods during the month of June in 2004 and 2005. Data were collected manually at various locations throughout the site, and through the use of underwater temperature monitors and a solar-powered weather station. Tides and currents were determined using computer software algorithms. The extent to which these abiotic factors influence the daily shark activity seen in the Dry Tortugas is presented in this work.

Supported by: FURSCA-Hyde Fellowship, Biology Department Upjohn Fund for Student Research, Sea Grant, W.W. Diehl Trustees' Professorship (Carrier)

ERIC JOHNSON, '06

"Annus Mirabilis"

Faculty Sponsor: Julie Stotz-Ghosh

Majors: Economics and Management, English (Creative Writing)
Hometown: Chicago, Ill.

TO THE READER

Of the smoke and fog of a London afternoon, you'll see this scene arrange itself—as it seemed to do—a story prepared for all the things to be said or left unsaid; do not start reading unless you are prepared to finish.

The scene comes and goes like the tide of the
Thames flows,
exposing rocky follies and murk-dirty
thoughts—
bringing closer what is left to come;
and dulling to distance all we are.

… My street was long and winding; it curved around and was split in two by an iron-fenced park with a bubbling fountain and plush greenery. The tall trees and thick shrubs and colorful flowerbeds were silhouetted by the rows of homogenous flat buildings that extended six to seven stories upwards. The street was long and tight, with sturdy architecture and cars packed into spaces. The air was thick from the accumulation of fog and smoke, which wafted in from Earl's Court and Cromwell: fog from the rain and smoke from the rattling car pipes hovered around the tops of these tall buildings, making them disappear in the distance like an endless row of whitewashed soldiers, lined up to infinity—guiding my first steps into London.
London, 2005

Supported by: FURSCA

AMY KRIEG, '08

Aligning Executive and Shareholder Interests

Faculty Sponsor: Michael Frandsen

Major: Economics and Management
Hometown: Brighton, Mich.

Recent popular press attention has focused concern on excessive executive compensation and how executives share in their companies' market performance. There has also been growing attention on the mechanisms of corporate governance and the roles of the board of directors. This study looks at one mechanism that corporate boards use to compel executives to share in the appreciation or depreciation of the companies' stock. Executive stock ownership guidelines have been identified as a mechanism of influential governance, a way to align the interests of managers and shareholders. Data were collected from the 2003 Fortune 500 companies' proxy statements from the Securities and Exchange Commission's EDGAR database, and then each company's approach to executive stock ownership was categorized as follows: (1) if executives were required to own stock, (2) if they were encouraged to own stock, (3) if they were neither required nor encouraged. The first two groups were then divided into two categories each based on whether or not the proxy statements specified the amount or type of required or encouraged stock ownership. An ANOVA analysis and a paired comparison analysis were then done to see whether required or encouraged stock ownership improved the performance of a company, as measured by return on equity.

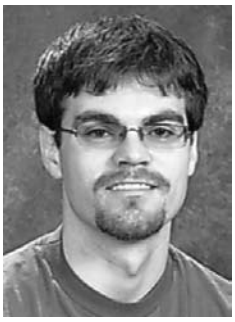
Supported by: FURSCA

ERIC KRIEGER, '06

Who Graduates under the No Child Left Behind Act?

Faculty Sponsor: Myron Levine

Major: Political Science
Hometown: Benton Harbor, Mich.



The No Child Left Behind Act (NCLB) represents a radical shift to establish national standards for educational policy. Graduation rate accountability is now a major component in measuring school performance. Under NCLB, schools are required to demonstrate that they are making Adequate Yearly Progress (AYP) toward improving the education they offer each year. Graduation rates and standardized testing scores are the areas to which the legislation gives the highest priority in determining whether schools are making AYP. New research suggests that without reform of the current methods of implementing graduation rate accountability, our efforts to hold schools accountable are falling far short.

NCLB faces shortcomings that have prevented graduation rates from becoming a major factor in determining whether schools are making AYP. The most serious of these shortcomings allows schools to push out academically low-performing students in their districts to raise standardized test scores. My research focuses on the challenges that a system of national graduation rate accountability, specifically the one prescribed by NCLB, faces and where we find ourselves today. Is the approach that the legislation takes the wrong one or are there provisions for graduation rate accountability that are not being implemented? Recommendations focus on improving implementation, standards, methods, and oversight to strengthen the role of graduation rate accountability under NCLB. The goal is a system of holding schools accountable, under which we are neither leaving students behind nor choosing whom we allow to create "success."

KRISTEN KRUM, '08

Prevalence of *Aeromonas hydrophila* Bacteria on Frogs and Toads at Michigan's Pierce Cedar Creek Institute

Faculty Sponsor: Dean McCurdy

Major: Biology
Hometown: Sturgis, Mich.

The disease 'red-leg' has been found to cause mass mortality in natural and captive populations of frogs and is frequently associated with the presence of the bacterium *Aeromonas hydrophila.* Bacteria such as *Aeromonas* are thought to take advantage of amphibians with weakened immune systems, possibly when animals are under stress. I measured infection rates of *Aeromonas* on frogs and toads at the Pierce Cedar Creek Institute, Hastings, Michigan between April and July, 2005. Bacteria were identified by swabbing the abdomen and legs of frogs and inoculating samples onto plates with Ryan's medium (48 hours at 37° C). Colonies were then identified to assess prevalence of *A. hydrophila* bacteria. I captured 185 different frogs of seven different species. Prevalence of *A. hydrophila* on frogs was 86.0%, which is much higher than what other researchers have observed on frogs in the Great Lakes region. There was no indication that sex of frogs or season was related to colonization by bacteria. Future research is required to assess whether prevalence and intensity of bacterial infections are related to stress in amphibians.

Supported by: FURSCA, Pierce Cedar Creek Institute, Foundation for Interdisciplinary Study, Faculty Development Committee

ANDREW LAKE, '07

BRUW: Bandwidth Reservation for User Work

Faculty Sponsor: David Reimann

Majors: Computer Science, Economics and Management
Hometown: Marshall, Mich.

Have you ever complained because your network is too slow when you need it the most? BRUW, a project started through the non-profit research organization Internet2, attempts to solve this problem with the idea of *bandwidth reservation*. By reserving bandwidth, a user is guaranteed to have a "pipe" large enough to send his or her data quickly across a network. This is especially important for those in the scientific research community who need to send large amounts of data quickly and cannot afford to be delayed by network congestion from other users. This talk will discuss how BRUW takes values entered by a user on a Web site and translates them into a dedicated "pipe" setup by routers that is guaranteed to provide the amount of bandwidth requested. In terms of technical detail, the talk will focus on BRUW's security considerations, use of Web services, and conditions necessary to reserve bandwidth across multiple domains. In addition to the technical details, the presentation will also briefly discuss future collaboration efforts with similar projects and the challenges/issues surrounding bandwidth reservation.

Supported by: Internet2

DIANA LANCASTER, '06

Intersex Mating Behavior in the Amphipod *Corophium volutator*

Faculty Sponsor: Dean McCurdy

Majors: Biology, German
Hometown: Ann Arbor, Mich.

The intertidal amphipod *Corophium volutator* lives in the mudflats in the Bay of Fundy, Canada. In populations of this amphipod, there are far more females than males, which can have significant ecological impacts on these animals and their parasites and predators. Within amphipod populations, as many as 10% of individuals are intersexes, which have both male and female characteristics. Previous research has shown that intersex amphipods can function as males when housed with females, but little is known about their ability to compete with males or fertilize females when in competition. Using small aquaria, I paired receptive female amphipods with either two males or a male and an intersex and observed interactions among females and potential mates. Few females became ovigerous (mated) during my study, although I observed that there was a great deal of contact among amphipods, including aggressive contact and mating interactions.

Supported by: FURSCA-Hyde Fellowship

ASHLEY LARIMER, '08

The Aria, "Steal Me, Sweet Thief," from Menotti's Opera *The Old Maid and the Thief*

Faculty Sponsors: Maureen Balke, Joy Lee, James Ball

Major: Vocal Performance
Hometown: Traverse City, Mich.

The purpose of this project was to research and perform an aria from *The Old Maid and the Thief*. The opera, composed by Menotti in 1939, premiered specifically for radio. It is a humorous tale of an old woman and her housekeeper, Laetitia, who take a thief into their home. The success of the opera's broadcast helped establish Menotti's career in the United States.

The aria I chose to sing is "Steal Me, Sweet Thief." My first task in performing this music was to research the character I would be portraying. Interpretation is important when performing because the singer must depict the emotion of the character as though they are acting through song. Another important part of performing is diction. I studied the language of the song and trained myself to pronounce each word according to the character and the dialect used. With diction comes drama because the language used describes feeling. As a singer I have to utilize both text and emotion, not only to tell a story through music, but also to visually portray what is happening within the piece.

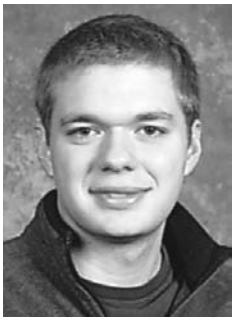
My next step was to rehearse and memorize, and I spent many hours with my teacher and vocal coach perfecting the piece. The final stage of the project is to showcase and perform the music. I have already competed against several students for a chance to perform with an orchestra, and I sang the piece at the National Association of Teachers of Singing competition in March.

MATTHEW LOZEN, '06

The Problems of Qualification: A Look at No Child Left Behind

Faculty Sponsor: Myron Levine

Major: History
Hometown: Port Huron, Mich.



On January 8, 2002, Congress passed the No Child Left Behind Act of 2001. This act was an attempt by the Congress and the Bush administration to install a national education program that would greatly improve the quality of schools across the nation. This legislation has at its foundation the undeniable principle that accountability is essential to ensuring that children can meet a high standard of learning. The act includes the mandate that students should be taught by highly qualified teachers. The implementation of this legislation has had many questioning whether this is possible given the current state and resources of the state Departments of Education. Many have argued that the policy was not thought through carefully enough or that too much of it has been left undecided. In an attempt to leave control to the state governments, the standards for what a teacher must do to become highly qualified were left intentionally vague. This created much confusion as it was questioned whether or not teachers who had been teaching for decades would be considered highly qualified or not. In the years since the legislation was signed into law, however, the definition of highly qualified has become much clearer. School districts have worked to include several options for teachers to become highly qualified. My research follows this policy as it has been implemented in school districts and the problems that it has encountered.

ERIN LUSK, '07

The Social Construction of Gender in Middle Childhood

Faculty Sponsor: Leonard Berkey

Major: Sociology
Hometown: Oscoda, Mich.

Gender is not something that is inherent in biology or nature; it is something that is learned and performed through the socialization process. The purpose of this study is to examine the social construction of gender in childhood, i.e., how children interpret and perform gender in our society. Gender is something that people are constantly performing, whether they are aware of it or not. Looking at how children construct gender is important because it allows us to see how gender is reinterpreted by children and then reproduced in our society. Essentially what this study is looking at is how children "do gender." Children in the fifth grade were observed during recess, and field notes were written based upon these observations. Other research has focused on the separation and segregation by gender on the playground. Instances of definite separation were found in this study; however, the ways in which boys and girls play together can shed light on the social construction of gender. This study found that most of the time gender was not an issue for children, and kids were just kids. However, sometimes there were confrontations in which gender became a salient issue. It was during those punctuated and highly memorable events that gender boundaries and gender differences were reinforced. This is how gender is reproduced in our society.

ERIN LUSK, '07

Policy Analysis of the Effectiveness and Implementation of the School Choice Provision of No Child Left Behind

Faculty Sponsor: Myron Levine

Major: Sociology
Hometown: Oscoda, Mich.

The purpose of this study is to examine the effectiveness and challenges of implementing the school choice provision of the No Child Left Behind Act. Different studies on school choice under NCLB done by scholars and organizations have been compared, and data from various organizations researching NCLB have been examined and analyzed. To gain some insider insight, two school administrators have been interviewed about the issue. One of the main problems found with school choice under NCLB is that it is underutilized. Causes for this underutilization could include: parental management of school choice, capacity issues, options available under NCLB, and timeframes of informing parents. One of the issues with NCLB is that it is different in every state because the law allows flexibility. This means that each state and each district has its own complications dealing with school choice under NCLB. Implementation of school choice is inconsistent. Parental management and parental notifications are key issues for implementing school choice. When parents are equipped with vague or little information, it can cause problems in implementing school choice. Some conclusions drawn from this analysis are that consistency across the U.S., or at least within the states, would make school choice more successful. Also advocacy for parents and students eligible for school choice would be extremely helpful in all areas but especially in large cities where managing school choice is more difficult.

RACHAEL LYON, '06

"Double Exposed": A Collection of Poems and Prose Inspired by Integration in Little Rock

Faculty Sponsor: Helena Mesa

Majors: English, German
Hometown: Nashville, Tenn.

After the recent deaths of Rosa Parks and Coretta Scott King, it has become increasingly evident that we are reaching the end of an era in American history. The modern civil rights movement, which began more than half a century ago, claims some of America's most outstanding heroes, including the Little Rock Nine, the black students who fought for their right to an equal education at Central High School in 1957.

This creative thesis builds a historical context for the reader. But more than that, in writing a collection of prose and poems, I have tried to convey what cannot be communicated in an objective historical account of the crisis at Central High. Already, accounts exist of the heroism and optimism of the nine students. Stories of their success thrill and amaze readers everywhere. But such accounts often place heroes within a context that separates them from the present. We fall into the habitual belief that there are those who accomplish amazing feats, and others who respect and admire them. So in these poems and prose pieces, I portray humanity as well as heroism, the private lives they led at home and the public lives they faced as their names were printed in national newspapers. I am interested in the time they spent between the end of one school day and the beginning of another, the interactions with their parents and family, and the *source* of the courage that was captured in newsreels. These pieces push the personal to the forefront in an attempt to discover what constructs a hero.

Supported by: FURSCA, David Johnson, '70, English Department, Ethnic Studies, Intercultural Affairs

COURTNEY MANGUS, '06

Detection of Global and Gene-Specific Uracil Levels in Down Syndrome and Non-Down Syndrome Myelogenous Leukemic Cell Lines

Faculty Sponsor: Kenneth Saville

Majors: Biology, Spanish
Hometown: Orchard Lake, Mich.

Children with Down Syndrome (DS) are predisposed to developing myeloid leukemias, particularly the subtype known as acute megakaryoblastic leukemia (AMkL). Of the DS patients who develop AMkL, nearly 100% display acquired mutations in exon 2 of the GATA1 gene, which encodes an essential transcription factor crucial in the formation of certain blood cells.

Another phenomenon associated with DS is the overexpression of the gene encoding the enzyme cystathionine β-Synthase (CBS). It is hypothesized that CBS overexpression ultimately results in a functional folate deficiency, which leads to altered nucleotide biosynthesis. As folate deficiency causes uracil misincorporation into DNA, our objective was to determine whether DS likewise results in uracil accumulation in DNA.

We hypothesized that hyper-mutagenesis of exon 2 in GATA1 could result from increased levels of uracil in DS patients with AMkL. Conversely, because non-DS cells show normal expression of CBS, and presumably display normal folate levels, these cells should display normal levels of uracil. To test this hypothesis, we examined both global and gene-specific uracil levels in myelogenous leukemic cell lines from Non-DS and DS patients. Preliminary data suggest greater global uracil accumulation in DS cell lines as compared to non-DS cell lines. However, it does not appear that GATA1 mutations result from increased levels of uracil in exon 2 of GATA1, as there appears to be no difference between non-DS and DS cell lines with respect to uracil levels in exon 2 specifically.

Supported by: Wayne State University, Karmanos Cancer Institute. This research was conducted under the guidance of Diane Cabelof and Larry Matherly.

STEPHANIE MANN, '06

Southern Medical Distinctiveness: Realities and Rhetoric in Retrospect

Faculty Sponsor: Marcy Sacks

Major: History
Hometown: Grand Rapids, Mich.

From the 1820s to 1861, tensions mounted between the northern and the southern United States, culminating in the Civil War. Various issues of contention occurred during this period, including the Missouri Compromise, the Tariff of Abominations, the Nullification Crisis, the Mexican War and Wilmot Proviso, the Compromise of 1850, the Kansas-Nebraska Act, and the election of Abraham Lincoln, all of which illuminated for northerners and southerners that they were inherently two different societies. With the end of the Atlantic slave trade in 1808, the South became progressively more defensive about slavery, while the North became gradually more critical. The South crafted a number of arguments to foster the notion that the American South was distinct from the North as part of its defense in the increasingly acrimonious debate over slavery, freedom, and westward expansion. During the course of these debates between the North and the South, medical professionals participated equally, even constructing arguments for distinctiveness surrounding southern medicine.

There were two main arguments the South made to support the claim of medical distinctiveness. First, southerners argued that the South was affected by a number of specific diseases distinct to the South. Second, southerners maintained that their intimate contact with large slave populations gave them a level of expertise on better slave health and health care. Little previous work has been conducted to examine this argument.

The notion of southern medical distinctiveness itself was not incorrect; it was, however, factually inaccurate. The antebellum South was medically distinct, but not in the way the ideologues claimed.

ATLEE MCFELLIN, '06

Feelings, Emotions, and the Historical Materialism of Karl Marx

Faculty Sponsor: William Rose

Major: Political Science
Hometown: Battle Creek, Mich.

Karl Marx, arguably, created the most comprehensive theoretical understanding of revolution. His philosophy of historical materialism culminated in describing the 'self-emancipation of the working class,' the overthrow of capitalism, and the creation of a socialist state pursuing world communism. He may have indefatigably worked toward this revolution, both theoretically and practically, but his theoretical work lacked an understanding of the emotional element in human beings and the role it plays in creating revolutionary social change, concomitantly limiting his ability to practically create that change.

Going back to the works of Karl Marx, as well as others who have written in the tradition of Marxism, the political theory and history of E. P. Thompson, and the social anthropology of Agnes Heller is essential to creating a system by which emotions can be understood in the formation of human consciousness, consciousness striving to create social change. Emotions play a key role in how human beings come to understand the world around them, providing the impetus from which they will rise up to change society. Looking at the traditional dichotomy of emotions versus rationality in a critical light to see the epistemological role of emotions has many implications for political action today, but it is necessary to provide the philosophical foundation for action through the works of Karl Marx, looking at the nature of consciousness with the assistance of others who have worked in the spirit and theoretical framework of Marxism.

Supported by: FURSCA

NATALIE MCKINNEY, '06

Time Resolved Dissociation Dynamics of Ne_2Br_2 and Ne_3Br_2 Clusters

Faculty Sponsor: Craig Bieler

Major: Chemistry
Hometown: North Adams, Mich.

Two-color pump-probe laser techniques were employed to follow the dissociation pathways of the van der Waals molecules Ne_2Br_2 and Ne_3Br_2. These clusters are first excited into the **B** electronic state with one laser, and a second laser probes dissociation intermediates and products with picosecond resolution. Modeling of the lifetimes associated with the appearance and disappearance of all species indicates that the dissociation occurs via a sequential pathway with little evidence of intermolecular vibrational redistribution.

Supported by: FURSCA-Kresge Fellowship, University of California, Irvine

SHELLY MCLEOD, '07

The Art and Craft of Composition: A Creative Project Designed to Compose a Piece for Woodwinds and Percussion

Faculty Sponsor: Andrew Bishop

Major: Music Education
Hometown: St. Ignace, Mich.

Last summer I composed a piece of music for a woodwind and percussion ensemble. My college career goal was to compose a piece for a small ensemble with the intent of publication. I began writing the piece by playing the piano and developing numerous possible themes, counterpoint medleys, and general expressions that I wanted to portray. Next, I formed the piece into four movements. Now that I had the basic outline, I created a chord structure showing the rise and fall of the piece. After 10 weeks of composition, I succeeded in the recreation of a personal fishing experience, in the form of music for woodwinds and percussion. The Albion College Symphonic Band read the piece in October and will be performing it in their spring 2007 season. After the performance, I will have a recording that I can send along with the score to publishers.

Supported by: FURSCA

MATTHEW MILLIGAN, '06

Early North Indian Buddhism: Architecture and Epigraphy in the Extant Record

Faculty Sponsor: Selva Raj

Major: Religious Studies
Hometown: Ortonville, Mich.

My research is an investigation of Early Historic (300 B.C.E.-300 C.E.) Buddhism. My primary focus centers on the extant archaeological record of the Buddhist monastic complexes located in north India. This study explores the construction of Buddhist ritual space and its use by members of the ordained and lay Buddhist communities. Because of their potential value, donative inscriptions and architectural space receive special attention. I utilize current archaeological and Buddhological scholarship and theories to reassess popular practice. Overall, I argue that the various early Buddhist communities were engaged in activity directed toward mundane benefits as opposed to intangible, elusive spiritual goals.

ELIZABETH MURRENUS, '06

Environmental Estrogens

Faculty Sponsor: David Green

Majors: Chemistry, Biology
Hometown: Farmington Hills, Mich.

In recent years, our knowledge of environmental contaminants, including estrogen, has increased. Environmental estrogens have always been present in many foods that we eat, but in recent years synthetic estrogens have been produced in pesticides, plastics, and pharmaceuticals. In fish and other wildlife, developmental problems have been attributed to environmental estrogens. In humans, xenoestrogens are thought to contribute to an increase in breast cancer, testicular cancer, and fibroids, and a decrease in sperm counts. Because of the health risks associated with environmental estrogens, research has been done to quantify estrogen levels in the environment. This presentation highlights laboratory research that explored detection techniques to determine estrogen levels at various Albion sites using gas chromatography-mass spectrometry.

JENNIFER NAJJAR, '06

Effects of Employee Age and Sex on Perceptions of Personality and Professional Competency

Faculty Sponsor: Andrew Christopher

Major: Psychology
Hometown: Novi, Mich.

This experiment examined the effects of employee age and sex on perceptions of personality and professional competence. Evolutionary theory predicts more negative perceptions of women as they age, but more positive perceptions of men as they age. Participants were shown a video of a young (i.e., early 20s) or middle-aged (i.e., late 40s) man or woman in a simulated performance review interview. The participants were then asked to read a performance evaluation of the employee and answer a short questionnaire that included perceptions of the employee's personality and questions about professional competence, such as ability to make decisions in a timely manner, organize a meeting, and delegate a task to subordinates.

Regarding personality perceptions, a young woman was considered more emotionally stable than a young man, but there were no differences in perceptions of emotional stability between a middle-aged woman and a middle-aged man. Regarding openness to experience, a young woman was considered to be less open than a young man; however, a middle-aged woman was considered to be more open than a middle-aged man. Regarding perceptions of professional competence, a young woman was considered to be more competent than a young man; however, a middle-aged woman was considered to be less competent than a middle-aged man. Our pattern of results suggests that aging generally has a deleterious effect on professional perceptions of women, but a beneficial effect on professional perceptions of men.

Supported by: FURSCA

AMY NARAMORE, '07

Body Image and Self-Esteem among Elementary School Girls

Faculty Sponsor: Leonard Berkey

Majors: Biology, Sociology
Hometown: Beloit, Ohio

My research on body image and self-esteem among fifth grade girls has been conducted through the Jessie's Gift Research Seminar which began last September. While helping local fifth grade kids with their social and reading skills, we have also undertaken our own individual research projects having to do with the social construction of childhood in Albion. My project focuses on body image and self-esteem among fifth grade girls. Studies have shown that girls who grow up in chaotic and/or low income families are much more likely to develop self-esteem issues and eating disorders than girls who do not. There has also been a steady increase in rates of eating disorders among African American girls.

I have examined other studies of trends from across the country, and have evaluated the applicability of these studies to girls in our fifth grade class. Since September I have been working with two girls and have drawn many of my field notes from observations and conversations with them. All observations and comments are drawn from general conversations and not from direct questioning on the issue. Other observations include watching girls while they walk through the halls, listening to their conversations, as well as comments and field notes made by others in my seminar class relating to the issue. Information was also gathered from teachers and school nutritionists.

SAMANTHA NEWMAN, '08

Value of Children, Child Labor, and Fertility Preferences in Urban Nigeria

Faculty Sponsor: 'Dimeji Togunde

Major: Speech Communication
Hometown: Wooster, Ohio

This study examines the value of children as perceived by parents and explores the link between child labor and fertility preferences in urban Nigeria. The data come from a 2002 survey of 1,535 parents and their children (aged 8 to 14 years) who are engaged in paid labor or services. Drawing on these data, the objectives are: to document the value of children as reported by parents in an urban setting of Nigeria and how perceived value varies by gender of the child, to draw out the link between the current economic contribution of children and additional children wanted by parents, and finally, to examine the correlates of additional children wanted, including child labor.

Findings indicate that sons are valued for their future patriarchal status and for their kinship role in continuing the family name. Daughters are more likely than sons to be relied upon for financial support at old age. The results also suggest that the labor contribution of children has become a central part of the fertility equation in urban areas. Parents wanted more children because of the financial support of current children, and they expected additional children to contribute to the household income. This study has implications for regulating child labor and other socioeconomic determinants of fertility in Nigeria.

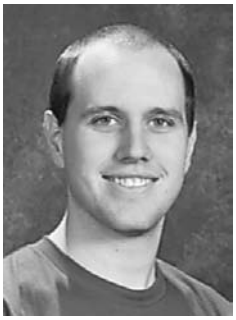
Supported by: FURSCA

ROSS O'HARA, '06

The Parsimony of Electoral Decision-Making: Need for Cognition and Need for Closure as Predictors of Political Interest

Faculty Sponsor: Mark Walter

Majors: Psychology, English
Hometown: Canton, Mich.



Most studies of electoral decision-making fail to recognize the internal factors each voter brings to the voting process. This study examined the role of Need for Cognition and Need for Closure as predictors of political interest.

The experiment was completed online by 93 college alumni and 158 college students. Part one of the experiment consisted of scales measuring Need for Cognition and Need for Closure, as well as demographic information. Part two was completed three weeks after completing the questionnaires. Participants were presented with three fictional candidates for United States president containing either partisan labels (Republican, Democrat, Independent) or meaningless labels (A, B, C). Participants had unlimited time to explore the candidates' views on fifteen political issues before being asked to vote.

Political interest was defined as the total number of political issues read by the participant. Results indicated that Need for Cognition had a positive relationship (r = .21) and Need for Closure a negative relationship (r = -.20) with political interest. Need for Cognition significantly predicted political interest, with participants low in Need for Cognition having less political interest than those high in Need for Cognition, regardless of their Need for Closure.

These results indicate that an individual's personality has a bearing on how they process political information and make electoral decisions. Significant differences arose between the alumni and student samples, indicating that the prominence of each personality facet may be related to age.

Supported by: FURSCA

DANIEL PAINTER, '06

Reproductive Behavior of Intersexes in the Intertidal Amphipod *Corophium volutator*

Faculty Sponsor: Dean McCurdy

Major: Biology
Hometown: Hillsdale, Mich.

Corophium volutator is an intertidal amphipod found in the mudflats of Nova Scotia, Canada. These amphipods are a key species in this environment in that they serve as a food source for both fish and shorebirds and their burrows stabilize and oxygenate mudflats. This species is also unusual because of female-biased sex ratios, which may lead to male-limitation in some cases and are thought to be caused, in part, by parasites that feminize males. Intersexes, which have morphological and anatomical features of males and females, also occur and appear to function as males. However, male function has only been demonstrated under laboratory conditions, so it is not known whether they function as males in natural populations. I investigated intersex function in the field by observing crawling and burrowing activity of intersexes versus males and females. As expected, I observed that intersexes were almost as likely to mate-search and pair with females as males, suggesting that they function as males in nature. In the lab, I investigated mate-searching further by videotaping crawling of males and intersexes to compare fine-tuned aspects of mate-searching behavior.

Supported by: FURSCA-Robson Fellowship

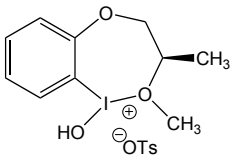
SHAUNA PARADINE, '08

Synthesis of a Chiral Hypervalent Iodine Reagent Starting from (S)-Propylene Oxide

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Schoolcraft, Mich.

Hypervalent iodine reagents are of considerable interest in the field of organic chemistry. These reagents have unique properties in organic reactions, and they can facilitate a number of transformations, many of which are significant in the development of pharmaceutical drugs and drug candidates. One particular facet of interest with these reagents is their potential to replace the heavy-metal catalysts that are currently used in industrial settings for similar reactions. By doing this, environmental hazards would be greatly reduced and waste removal would be simplified. This research has been an exploration into the synthesis of a new class of chiral hypervalent iodine reagents. This method uses (S)-propylene oxide and 2-iodophenol as starting materials, both of which are commercially available reagents. The abbreviated synthesis, only three steps, includes an epoxide-opening reaction, methylation, and oxidation protocol. Reported here will be the progress toward this synthesis.



Supported by: FURSCA, American Chemical Society Petroleum Research Fund

STEVEN PERUSKI, '06

Social Support of Female Legislators in the State of Michigan

Faculty Sponsor: Dyron Dabney

Major: History
Hometown: Flushing, Mich.

It is a well known fact that women are underrepresented throughout American legislative politics. The State of Michigan certainly is no exception with respect to the legislative representation of women. This study investigates the underrepresentation of women in legislatures. The central question this study seeks to answer is why women don't run for elected political office. The goal of this study is to determine the importance of social support, particularly spousal support, on women's considerations of elected public office.

The findings of the study are generated through a research methodology of one-hour face-to-face interviews with 11 women legislators currently serving in elected public office. Participants of the study are drawn from women from both major political parties, the Republican Party and the Democratic Party, and both houses of the Michigan legislature. The study evaluates one-third of present-day Michigan state legislators—it is not an exhaustive treatment of women state legislators for the state of Michigan—and thus, it is difficult to generalize from the findings.

Common legislators' response patterns uncovered in this study include the difficulty many women have in fund raising, the effects of term limits on the numeric representation of women in the Michigan legislature, and the significance of external encouragement to run.

Supported by: FURSCA, Michigan Colleges Foundation (Earhart Grant)

MARIA PINTAR, '06

A Naturalistic Study of Post-Conflict Interactions among Preschool Boys and Girls

Faculty Sponsor: Jamie Walter

Majors: Psychology, French
Hometown: Holland, Mich.

Preschool children's behaviors during conflict have been shown to be related to their social competence, but less is known about post-conflict behavior. The present study was designed to explore how quickly and by what means preschool children reconcile after a conflict. In addition, these patterns were expected to relate to social competence and gender.

Fifty-eight preschool children aged 2-6 years old were recruited from two preschools in small Midwestern towns. Participants were from predominantly white, middle- and working-class families. Using an event sampling method, instances of conflict and post-conflict resolution during free play were recorded. Parents completed a measure of social competence for their child.

Results revealed that in many conflict instances children never reconciled, the teacher intervened, or reconciliations occurred shortly after the conflict ended. As expected, children who were more socially competent reconciled more quickly than children who were less socially competent. Social competence was correlated with use of verbal power, but not with apologizing. Results revealed several interesting patterns related to gender. Conflict was significantly more likely to occur in same-sex than mixed-sex groups. In addition, boys reconciled more quickly than girls.

Taken together, these findings suggest that socially competent children may have the skills to handle peer conflict on their own, but preschoolers may be too young to consistently use apology as a strategy in conflict resolution. Finally, boys' and girls' post-conflict interaction differed in several ways, suggesting that preschool children's conflict interactions are gender-regulated.

Supported by: FURSCA

TROY PIWOWARSKI, '06

Effects of Mortality Salience and Literal Immortality on Prejudicial Beliefs

Faculty Sponsor: Mark Walter

Majors: Psychology, Art
Hometown: Cadillac, Mich.

Terror Management Theory (TMT) posits a closely-knit relationship between awareness of one's own death (mortality salience; MS) and numerous seemingly unrelated beliefs and behaviors. Stellmacher and Petzel (2005) revealed that mortality salience threatens authoritarians, activating their inherent prejudice.

The present research offered two hypotheses: (1) MS will increase homonegativity (negative regard for homosexuals) in authoritarians and (2) subsequent presentation of evidence that an afterlife exists will decrease homonegativity in authoritarians.

Albion College and community participants (N = 187) completed a questionnaire packet that contained three personality inventories. The MS manipulation (writing a paragraph about one's own death) induced death awareness while a control manipulation (writing a paragraph about watching television) did not. The afterlife manipulation presented either evidence supporting an afterlife or evidence dispelling the existence of an afterlife. Participants then completed a homonegativity inventory.

Strong correlations between authoritarianism and homonegativity (r = .66, p < .001) supported hypothesis 1. Regression analyses revealed that (1) MS, afterlife, and authoritarianism were significantly interactive in predicting homonegativity (β = -.91, $t(183)$ = -29.28, p < .001) in authoritarians, and (2) presentation of support for the afterlife in the absence of MS significantly increased homonegativity (β = .014, $t(183)$ = 2.06, p < .05) in authoritarians.

Data supported both hypotheses, despite an inversion of the expected effect for afterlife. This increase in prejudice is most likely due to the lack of burden that MS would present, coupled with a guarantee of literal afterlife, which might allow the individual to more easily derogate dissimilar others.

Supported by: FURSCA

TROY PIWOWARSKI, '06

Facing the Authoritarian: Artistic Depiction of a Troublesome Personality Orientation

Faculty Sponsor: Douglas Goering

Majors: Psychology, Art
Hometown: Cadillac, Mich.

Right-Wing Authoritarianism (RWA) is a personality orientation generally characterized by blind submission to authority figures, often with an especially aggressive fervor. RWA has been the focus of psychological research since the mid-1940s, during the advent of Fascism and Nazism in Europe. Since the inception of the term, a great deal has been discovered about the authoritarian, and it has become much clearer how widespread and menacing this personality trait is in contemporary society.

This series, entitled *Facing the Authoritarian*, is an attempt to examine not only the elements that make up the authoritarian personality, but the specifics that make it a reality in our society. A substantial effort has been made to maintain the objective underpinnings of the research, despite the political charge that the series carries. Accurate demographic and social group representation is maintained so that the statement carries validity as well as emotion.

Each of the seven smaller portraits features the authoritarian, blindfolded with a different material symbolic of a particular dogma or following. They are supplemented by two larger 3x3-foot paintings that are high magnifications of two of those symbols, as well as a 6x4-foot enlargement of a biblical text from Isaiah. While the portraits afford the viewer an external perspective of the authoritarian, the larger paintings serve to reverse that relationship, forcing a reexamination of each icon from within the blindfold.

Supported by: FURSCA

JAYNE PTOLEMY, '06

"In Decency of . . . Oconomy": Race and Respectability in Early National Philadelphian Benevolence

Faculty Sponsor: Marcy Sacks

Major: History
Hometown: Dryden, Mich.

Focusing on Philadelphia in the period between Pennsylvania's Gradual Abolition Act in 1780 and the rise of hardening racial distinctions in the 1830s, my historical research explores the limitations and implications of benevolent activities. Specifically, this project addresses how white participants in benevolent institutions conflated rising concerns over social instability, evident through increasingly visible white impoverishment, with anxieties over the emerging free black population. I explore how such philanthropic action, in referring to the free black residents of Philadelphia through terms of respectable behavior and analogies to the lower sorts, placed significant restrictions on potential white assistance. Benevolent acts, I contend, were especially significant in the perpetuation of previous racial hierarchies as well as the formulation of distinct racial and economic boundaries in the new republic. This project also considers how this language of similarity between free blacks and poor whites reflected itself within those groups and was concurrently created and manipulated by them. This thesis analyzes how the ideological connection between free blacks and poorer whites, while providing a language of similarity among marginal groups, ultimately facilitated the separation of black and white populations that relied upon notions of respectability.

Supported by: FURSCA, Shear/Mellon, Michigan Colleges Foundation (Earhart Grant)

RACHEL RANSOM, '08

Monitoring Blood Parameters for a Captive Population of Nurse Sharks *(Ginglymostoma cirratum)*

Faculty Sponsor: Jeffrey Carrier

Major: Biology
Hometown: Midland, Mich.

Blood is extremely useful as both a diagnostic and research tool that can yield pertinent, real-time information about an animal's health and overall physiological condition. The Albion College shark research lab considers routine blood collection and observation as an important way to monitor the health of captive nurse sharks over time when compared to the literature and to other captive facilities such as SeaWorld Adventure Parks (Orlando, Florida).

The methodology for monitoring electrolytes and blood minerals includes the drawing of blood by caudal venipuncture. Blood is then processed by standard hematological techniques and used for automated blood chemistries and to make blood smears for blood cell counts. The smears are fixed in methanol and stained with Wright-Giemsa stain and observed under a microscope. It is the count of each type of leukocyte that gives a measurement for animal health including lymphocytes, granulocytes (heterophils, eosinophils, and basophils), and monocytes. While these numbers vary by species, they tend to lie around 50-75% lymphocytes, 10-30% heterophils, 0-10% eosinophils, 0-1% basophils, and 0-3% monocytes for elasmobranchs.

Blood samples have also been sent to Regional Biomedical Laboratories for comparisons and quality assurance. The laboratory provides blood cell differential counts as well as quantitative blood chemistries for the amount of certain blood components such as cholesterol, proteins, calcium, and other trace elements. Our results suggest that overall blood chemistries for the 12 animals held in captivity are within normal limits for captive animals of this species and that there is no difference through time for individuals that have been repetitively sampled.

Supported by: Defense Advanced Research Projects Agency, W. W. Diehl Trustees' Professorship (Carrier)

KARLY REDBURN, '06

Adolescent Conflict between Siblings and Peers: Affective Quality and Conflict Resolution

Faculty Sponsor: Jamie Walter

Major: Psychology
Hometown: Mason, Mich.

Previous research on conflict during adolescence typically focuses on conflict with parents or peers. These relationships differ in the kinship bond and amount of choice in membership such that parent relationships are categorized as closed and peer relationships are considered open. Closed (or parent-child) relationships tend to have more conflict and less constructive conflict resolution than egalitarian peer relationships. Sibling relationships, although closed, lack the hierarchy of a parent relationship and are comparable to peer relationships when looking at support and disclosure. Therefore, it is unclear if sibling conflict patterns will mirror those with parents or peers.

The present study examined affect and styles of conflict resolution in adolescents' sibling and peer relationships. Thirty participants, between the ages of 18-19, were recruited from a small liberal arts school in mid-Michigan. Participants completed a series of questionnaires assessing conflict within both peer and sibling relationships, support within the relationships, and conflict resolution styles generally used. Participants also wrote a description of a conflict with a peer and one with a sibling. These open-ended descriptions were then coded for affect and conflict resolution.

It is expected that adolescents will have greater amounts of conflict, use less constructive forms of conflict resolution, and show greater amounts of negative affect with siblings than with peers. This supports the theory that closed relationships can handle greater amounts of conflict without dissolving. It is expected adolescents will use more compromise in conflicting situations with peers than with siblings in order to preserve this open relationship.

Supported by: FURSCA

SARAH RICHARDSON, '08

Household Size and Composition as Correlates of Child Labor in Urban Nigeria

Faculty Sponsor: 'Dimeji Togunde

Major: Sociology
Hometown: Saginaw, Mich.

My research draws on interviews with 1,535 parents and their children to examine the relationship between child labor and various household variables in urban Nigeria, where child labor studies have been very limited. This research provides a comprehensive understanding of the household factors and residential dynamics through which child labor evolves. My findings demonstrate the usefulness of the household production theory in explaining the socio-economic ramification and household context of child labor. These findings also indicate that, although child labor is mostly caused by poverty and the need to prepare children with skills and training useful for future occupations, the size of the household, number of children in the household, number of children contributing to the household income, child's age, and age at which the child started working are all significantly and positively correlated with children's hours of work. However, gender compositions of the children or of the household head and age of the household head have little or no relationship with children's hours of work. Additionally, parental socio-economic status and family structure variables are associated with fewer hours of children's work. Findings have implications for policies aimed at regulating child labor in Nigeria.

Supported by: FURSCA

KATIE RIEPEN, '09

(See Andrew Fidler, '08, Katie Riepen, '09)

AMY RISKE, '06

Creation of the New: Music Composition as a Means of Self-Expression

Faculty Sponsor: Andrew Bishop

Major: Music Composition
Hometown: Hanover, Mich.

My research focuses on the process of composing and how music can affect a person's emotions. *Mortalis Oriens* is a modern work for symphonic band that was composed during the summer of 2005. As a composer, I am frequently questioned about the process of composition. Thus, I will explain the procedures and development of the piece from its beginning chord progressions to the final score. Audio examples from rehearsals and performances will be included in the presentation.

Furthermore, psychological experimentation investigates the links between the theoretical analysis of the music and its effect on human emotion. Participants in the study were asked to reflect indirectly on their emotions while hearing *Mortalis Oriens* played in the background versus completing the study in silence. The results of this study help to clarify the link between a composer's desire to elicit specific emotions from his or her audience and the theoretical attributes that can be used to do so.

Supported by: FURSCA

LINDSAY RUBIN, '07

Major: Psychology, Neuroscience Concentration
Hometown: Orchard Lake, Mich.

JENNIFER SMITH, '07

Major: Psychology
Hometown: Ann Arbor, Mich.

Sensory System Functions in Nurse Sharks *(Ginglymostoma cirratum)*: Acquisition and Interpretation of Electrophysiology in Olfactory and Acoustic Nerve Pathways

Faculty Sponsor: Jeffrey Carrier

Rubin

Smith

The functioning of the sensory system in sharks while in their marine environment is largely unexplored. The present study involves investigating the relationship between sensory physiology of olfactory and acoustical systems in nurse sharks (*Ginglymostoma cirratum*) and how sensory input translates to behavioral responses. In order to study single nerve cell electrical activities, microscale silicon- and polymer-substrate neural probes were designed in collaboration with the University of Michigan Biomedical Engineering Department. These prototypical electrodes are implanted into the olfactory tract and acoustical system to measure neural signals and characterize basic functions as they relate to behavior. Further study will provide a unique opportunity to relate sensory and motor responses to the animals' behaviors in both the laboratory and ocean environment.

Supported by: Defense Advanced Research Projects Agency, W. W. Diehl Trustees' Professorship (Carrier)

PATRICK RYAN, '06

Law, Literature, and the U.S. Constitution: A Defense of Textual Autonomy

Faculty Sponsor: Emmanuel Yewah

Major: Public Policy
Hometown: Augusta, Ga.

My research, interdisciplinary in its approach, seeks to reexamine the important and somewhat "misunderstood" relationship between law and literature. It draws from critical theories derived from both disciplines to provide an insightful and innovative reading of the United States Constitution. It also discusses the methodology taken by the Supreme Court in its interpretation or interpretations of the Constitution and asks whether adherence to one single meaning of the text is driven by ideology rather than legality. Additionally, the study contends that these legal and literary theories and their applications are attempts by their practitioners not only to illuminate their disciplines but, equally importantly, to preserve or, indeed, defend disciplinary autonomy.

LILIANE SALIBA, '07

Locus of Control, Materialism, and Well-Being

Faculty Sponsor: Andrew Christopher

Major: Psychology
Hometown: Solon, Ohio

This study examined the interrelationships between feelings of control, materialistic tendencies, and psychological well-being. I designed a survey that measured *feelings of control* (e.g., "Whether or not I get into a car accident depends mostly on how good a driver I am" and "When I make

plans, I am almost certain to make them work"), *materialism* (e.g., "I enjoy spending money on things that aren't practical" and "The things I own say a lot about how well I'm doing in life"), and *affective well-being* (e.g., how "proud," "jittery," or "excited" one tends to feel). A total of 440 participants from across the United States completed the survey online.

Our results indicated the less control people felt, the worse their affective well-being tended to be. Also, the less control people felt, the more materialistic they tended to be, and the more materialistic people were, the worse their affective well-being. Most importantly, materialism mediated the relationship between feelings of control and affective well-being. Stated differently, when people feel as though they lack control in their lives, they may value and strive to acquire material possessions to avoid the lower levels of affective well-being associated with lacking control. This strategy may be psychologically adaptive in the short-term; however, the fact that high levels of materialism were associated with lower levels of affective well-being suggests that turning to possessions when faced with a lack of control is ultimately maladaptive. When lacking control, people should seek means other than material possessions to maintain their well-being.

Supported by: FURSCA, Faculty Development Committee

LAUREN SAYIG, '08

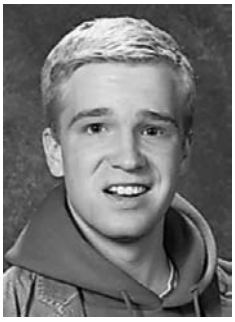
(See Meagan Bosket, '09, Lauren Sayig, '08)

JASON SEBACHER, '08

The Keys to the Cabinets: Understanding Dalinian Philosophy

Faculty Sponsor: Bille Wickre

Major: English Literature
Hometown: Sturgis, Mich.



"In Catalan, Dali means Desire."
–Salvador Dali

During the summer of 2005, I studied the life and paintings of the Catalan artist Salvador Dali and developed a theory that all of Dali's paintings, when considered as more of a storyboard of his life than of disjoined pictures, are a discourse on the nature of desire, which Dali claims is his namesake. I found that there are four distinct desires that occur in every single one of his over 1,000 paintings at different levels and in varying ways: narcissistic desires, sadomasochistic desires, fetishistic desires, and remunerative desires. My presentation is abridged from a two-hour lecture that was given at the beginning of the year, in which I explain how Dali's desires were displaced into the periods of his art. I plan to highlight only his most famous of the five periods, the Surreal, in which his desires are most explicitly communicated.

Supported by: FURSCA

WENDY SIMANTON, '07

(See Stephanie Clark, '06, Wendy Simanton, '07)

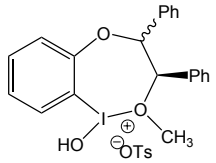
SARAH SIMMONS, '07

Progress toward a New Class of Chiral Hypervalent Iodine Reagents

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Scotts, Mich.

We report here our progress toward the synthesis of a hypervalent iodine reagent. Difficulty with the final oxidation of the iodine using traditional oxidants led us to investigate the electrochemistry of oxygenated iodobenzenes. A summary of our progress in this area is also presented.



Supported by: FURSCA, American Chemical Society Petroleum Research Fund

JENNIFER SMITH, '07

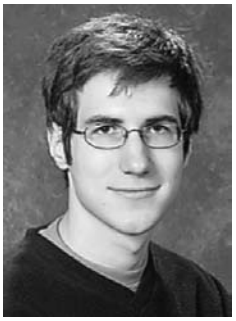
(See Lindsay Rubin, '07, Jennifer Smith, '07)

JOSEPH SMITH, '06

Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of 1-ethyl-3-methylimidazolium tetrafluoroborate [EMIM] [BF_4]

Faculty Sponsor: Clifford Harris

Major: Chemistry
Hometown: Commerce Township, Mich.



Ionic liquids (ILs) are a potential new class of solvents deemed to be environmentally friendly due to their low volatility and ability to be recycled. One IL was examined, 1-ethyl-

3-methylimidazolium tetrafluoroborate ([EMIM][BF_4]), in order to determine its suitability as a solvent for oxidation reactions using potassium permanganate. Oxidation reactions are a class of reactions that adds electrons to a molecule, usually by adding an oxygen. Solubility of various traditional organic solvents in [EMIM][BF_4] was determined by massing a saturated solution of the IL in a solvent and then removing the solvent and massing again. Reactivity of potassium permanganate with [EMIM][BF_4] was determined by mixing the IL with permanganate and then analyzed using nuclear magnetic resonance (NMR) to determine if the IL was altered. Early results indicate that [EMIM][BF_4] is degraded by permanganate oxidation. Since it is degraded by the oxidant, [EMIM][BF_4] is probably not suitable for permanganate oxidation reactions. This reaction may be useful for the clean-up of hazardous waste should the IL be inadvertently released into the environment.

Supported by: EcoSynthetics

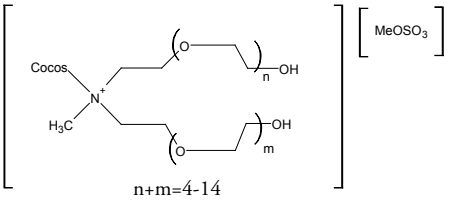
ANNA STROUD, '06

Ionic Liquids and Potassium Permanganate: Characterization and Initial Study of Ammoeng 100

Faculty Sponsor: Clifford Harris

Majors: Biology, Studio Art
Hometown: Ann Arbor, Mich.

Some chemical and physical properties of Ammoeng 100 (1) have been measured. These included HNMR, CNMR, and IR spectroscopic characterization as well as determination of solubility in water and a variety of organic solvents. The interaction of the neat ionic liquid and potassium permanganate solid was also studied to determine this ionic liquid's suitability for use as a permanganate oxidation solvent.



Structure 1. Ammoeng 100

Supported by: EcoSynthetics

RACHEL SZYMANSKI, '07

The Career Experiences of Professional Musicians

Faculty Sponsor: Scott Melzer

Majors: Sociology, Music
Hometown: Dexter, Mich.

Music is a pervasive part of American culture. Arguably, the people most responsible for ensuring that this part of our culture continues to persist and develop are professional musicians. Currently, I am conducting a sociological research project to determine which groups of people consider themselves to be professional musicians and what their lives are actually like. This project is exploratory in nature because few sociologists have examined musicians over the past 30 years. From sociological research on musicians and other artists as well as data from the National Endowment for the Arts, I have found that pursuing a career in music can be difficult due to factors such as the extensive training and practice necessary and the fact that an income from performing may be insufficient.

For my project I am conducting qualitative semi-structured interviews with a variety of professional instrumental musicians about their educational and career experiences. This research is still in progress. However, preliminary findings show that although musicians' professional development is difficult and their incomes are often low, all musicians interviewed seem to feel that the satisfaction they get from making music is worth the struggle. Final conclusions will be reached in the culmination of the project, my senior thesis, which will be completed in spring 2007. I hope to share my thesis at a sociological conference, so a better understanding of this unique career might inspire other research about social aspects of the performing arts.

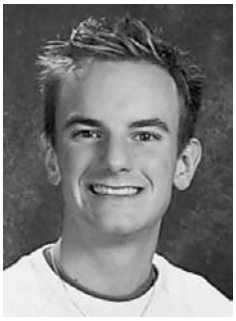
Supported by: FURSCA

JOE TAYLOR, '06

Barriers, Stigma, Support, Hope: Transitional Housing Residents' Experiences with HIV/AIDS and Homelessness

Faculty Sponsor: Scott Melzer

Major: Sociology
Hometown: Walled Lake, Mich.



Individuals affected by both HIV/AIDS and homelessness are often overlooked and understudied segments of the population. This exploratory study uses grounded theory to examine the experience of individuals impacted by HIV/AIDS and homelessness in transitional housing in a large Midwestern city. Theory used to examine the barriers and stigma of the population will include both macro and micro level approaches such as conflict theory and symbolic interactionism theory.

Data collected from field notes during a summer internship and semi-structured interviews reveal that these individuals face barriers and frustrations in the form of employment, housing, and family reaction to the disease. The data also reveal that individuals are able to manage HIV/AIDS with the assistance of programs such as ADAP (AIDS Drug Assistance Program) and that religion does not directly impact how these participants deal with the disease. Management of HIV/AIDS is no longer a main concern and the shift in focus has moved from finding a place where individuals could die in peace to assisting people to reenter society in a meaningful manner. Further research on the

topic could address how to best ensure that a person is able to live adequately outside of transitional housing and if structural barriers such as social class disadvantages can be overcome.

Supported by: FURSCA

NICOLE TRACHSEL, '06

Art and Autonomy in Scotland

Faculty Sponsor: Bille Wickre

Major: Art and Art History
Hometown: Albion, Mich.

"Without tradition, art is a flock of sheep without a shepherd. Without innovation, it is a corpse."
– Sir Winston Churchill

Art is often used as a vehicle for political reformation, as a social outlet, or even for economic growth. Art is therefore interchangeable with these issues. Our way of seeing art, understanding art, and appreciating art has changed as we have learned to 'use' art as a medium for progression.

My research explores these concepts using the history of Scottish art and Scotland's modern 'cultural explosion'. Through studying Scottish art, I have outlined how and why our perceptions and the function of art have changed and how Scotland has thoroughly adapted this formula for *using* art as a vehicle for cultural identity. Scotland's journey to find cultural identity through the use of art (such art that creates nationalism and economic growth) can be seen in the country's modern political movement for unity.

This formula for achievement in the arts is a constant circle of give and take. It is important to see how modern Scotland has set up a political agenda and *used* its art to create successful recognition and power throughout the (art) world.

Supported by: FURSCA

JORDAN TROISI, '06

Predicting Money Motives: The Interactive Effects of the Protestant Work Ethic and the Need for Cognition

Faculty Sponsor: Andrew Christopher

Majors: Psychology, English
Hometown: Holt, Mich.

Money is a relatively ubiquitous feature of daily life for many people. Srivastava, Locke, and Bartol (2001) developed a scale to measure money motives (i.e., reasons why people want to earn money). However, no research has yet examined individual differences in these motivations. This study examined the interactive effects of the Protestant work ethic (PWE) and the need for cognition (NFC) on three money motivations.

Participants completed Srivastava et al.'s (2001) Money Motives scale. The scale has three factors: a negative money motive factor (e.g., "To prove I am not a failure"), a positive money motive factor (e.g., "To be able to support a family"), and a freedom of action motive factor (e.g., "To direct my own life with no interference from anyone else"). Participants also completed Mirels and Garrett's (1971) measure of the PWE (e.g., "I often feel I would be more successful if I sacrificed certain pleasures") and Cacioppo et al.'s (1984) measure of the NFC (e.g., "I really enjoy a task that involves coming up with new solutions to problems").

Results indicated that PWE was positively related to all three money motivations. However, high PWEs who were low NFCs seemed particularly motivated for negative reasons to acquire money, which Srivastava et al. (2001) found was related to poor psychological functioning.

Our research suggests that although PWE endorsement is associated with a greater motivation for money, such motivations tend to depend on one's NFC.

Supported by: FURSCA-Metalonis Fellowship, Faculty Development Committee

TAMAR VESCOSO, '06

Grave Robbing to Donor Bequest: The Changing Perception of Cadaver Use in Medicine from the Nineteenth Century to the Present Day

Faculty Sponsor: Amy Terstriep

Majors: Chemistry, Biology
Hometown: Garden City, Mich.

In today's society, ill or injured people who need new organs have the potential of receiving them. A few hundred years ago this was not a realistic option. Our perceptions of the human body and medicine have changed from the beginning of the nineteenth century when the study of anatomy became an important subject in medical teaching. This presentation will explore the controversies surrounding the use of cadavers in learning and research in the Victorian era, as well as how the past has shaped medicine and surgery today. Grave robbing, the selling of bodies to anatomists, and regulating schools of medicine will be discussed. In addition, the varying uses of cadavers today (from organ donation to plastination) will be discussed to show how vastly altered Western medicine is as a result of shifting views on the use of cadavers in medicine.

Supported by: FURSCA

CHRISTINA WADE, '06

The Construction of the Ideal Gentlemen or the Making of Future Imperialist Leaders

Faculty Sponsor: Christopher Hagerman

Major: History
Hometown: Mary Esther, Fla.

British imperialism during the latter half of the nineteenth century has been thoroughly studied. In 1857, the British empire was threatened by a mutiny in colonial India and needed to culturally compensate for that. Britain's great empire was threatened for the first time, which resulted in the empire attempting to create a sort of man who could maintain colonial inferiority. Many historians agree that there is a distinct difference in how the concept of empire was viewed between the first and second halves of the nineteenth century. Some historians even go as far as to link imperialism to British public schools. Public schools educated the privileged upper class. These boys, because of their social and financial position in life, became regarded as future leaders of Britain. Public schools paid particularly close attention to training the character of the boys who attended in hope of creating an ideal gentleman. Using primary sources, it is possible to discern that both the public schools and the empire set down the criteria for ideal British manhood as being useful, Christian, athletically aggressive, brave, and hard-working. The cult of masculinity or creation of an ideal gentleman, originating in British public schools, contributed to imperialism by producing a specific breed of able, patriotic, and entitled men for the greater good of managing and controlling Britain's extensive empire.

Supported by: FURSCA

SARAH WINGO, '07

Popular Culture as Propaganda: Finding Madonna in Shakespeare

Faculty Sponsor: Margaret Young

Major: Theatre
Hometown: Ferndale, Mich.

Scholars of propaganda have tended to focus on either straightforward political propaganda or artifacts of popular culture that are easily recognizable examples from the past to define propaganda for the now, while audience effects scholars have tended to focus on the socializing power of popular media. Thus, *Triumph of the Will* is examined as an example of Nazi propaganda while Madonna videos as examples of the socializing power of popular media.

This tendency to separate "propaganda" from the socialization power of the media extends backwards in time. For example, when studying the propagandistic power of Shakespeare, scholars have all too often focused on the historical plays (such as *Richard III*) or the dramas (such as *Macbeth* and *Hamlet*) rather than examining the propagandistic power and messages that one can find in Shakespeare's comedies. However, like music videos, comedies also have the power to wash over their audience and leave the satisfied viewers unaware that they have been receiving messages that have ideological and political import.

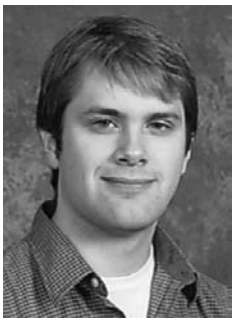
Supported by: FURSCA

DANIEL WRESCHNIG, '06

The Effect of Warming on Deciduous Forest Growth in the Eastern United States, with Data from Oak Ridge, Tennessee

Faculty Sponsor: Dan Skean

Majors: Biology, English
Hometown: Manistee, Mich.



Climatic warming is predicted to affect forest migration, succession, and growth, according to many computer models. The success of a modeling approach in understanding the effects of climatic warming has been hampered, however, by an incomplete understanding of the role acclimation—the adjustment of individuals to changes in local environment—will play in the responses of trees subjected to future warming.

To better understand the interaction among warming, acclimation, and growth, individuals from three species native to different temperature regimes (*Quercus rubra*, *Betula alleghaniensis*, and *Liquidambar styraciflua*) were grown together in open-topped warming chambers maintained at ambient, +2, and +4° C. Seedling height and diameter were measured intermittently during the growing season for four years, and average relative growth rates (RGRs) for each interval were calculated based on D^2H (diameter * diameter * height) for each species by treatment. RGRs were tested via multiple regressions against condition variables, including growing degree days, average rainfall, average temperature, vapor pressure deficit, and photosynthetically active radiation (PAR). One-way analysis of variance (ANOVA) and multiple regression analyses showed little significant difference between treatments and no correlation between temperature and RGR, indicating acclimation. Further study

of warming and acclimation in trees will be necessary, as there is much species-specific information to be collected.

Supported by: Student Undergraduate Laboratory Internships (SULI) Program, Office of Science (Biological and Environmental Research, Program for Ecosystem Research), U.S. Department of Energy. This research was conducted at Oak Ridge National Laboratory under the guidance of Carla Gunderson.

LINDSAY ZEIGIN-NETTER, '08

Appalachia: The True Cost of Coal

Faculty Sponsor: Wesley Dick

Major: Sociology
Hometown: Novi, Mich.

A region of great natural beauty, Central Appalachia is also rich in natural resources. In the mountains of Kentucky and West Virginia, fortunes have been made mining coal. Coal has indeed been king for more than a century. Yet, the region has also been the poster child for poverty and environmental degradation. How can one explain this paradox of wealth and poverty? How can one solve the riddle of natural beauty and environmental destruction? Although coal is king, what is the true cost of coal?

Historically, underground coal mining has claimed thousands of victims in mine explosions. The 2005 Sago mine disaster in West Virginia was a dramatic reminder of this tragic history. While mining deaths have decreased in recent years, a key factor in this trend has been the replacement of underground mining by surface mining. In Central Appalachia, this mining technique, known as mountaintop removal, is causing irreversible devastation to the environment.

The American addiction to fossil fuels, including coal, makes it likely that the demand for Appalachian coal will continue. If Americans knew the true costs of coal, would they conserve energy?

I first became interested in this topic after spending summer 2005 working for a non-profit organization in West Virginia. I further researched Appalachia coal mining in an Environmental History course and the Environmental Institute's Appalachian field trip seminar. Through all of this, one learns to appreciate the rich cultural gifts and the warmth of the Appalachian people. This study is focused on "the true costs of coal," but it ultimately provides a window on the American soul.

ERIC ZIEM, '06

Attitudes toward Capital Punishment

Faculty Sponsor: Mark Walter

Major: Psychology
Hometown: Milford, Mich.

This study examines the relationships among race, gender, personality, and attitudes toward capital punishment. Participants included introductory psychology students from a small Midwestern liberal arts college and a sample of the general population who had volunteered to participate in an online research database. Participants completed a social dominance orientation scale (SDO), a right-wing authoritarianism scale (RWA), a social desirability scale, and an attitudes toward capital punishment scale that measured five different aspects of the death penalty. Previous research has suggested that males tend to favor capital punishment more than females (Whitehead & Blankenship, 2000), while whites tend to favor capital punishment more than African Americans (Soss, Langbein, & Metelko, 2003). This study examines these differences by accessing the different groups' ideas toward capital punishment as a function of the participant's social dominance orientation and right-wing authoritarianism. It is predicted that when SDO and, to a lesser extent, RWA are accounted for the correlation between gender and attitudes toward the death penalty as well as the correlation between race and death penalty attitudes will become non-significant. Results will be discussed with respect to SDO and RWA and how each differentially explains different aspects of death penalty attitudes.

Supported by: Faculty Development Committee

JONATHAN ZOMBECK, '06

The Interaction of Ginseng and Nicotine on Anxiety

Faculty Sponsor: W. Jeffrey Wilson

Major: Psychology
Hometown: Midland, Mich.

The study of drug interactions is vital to fully understanding the actions of pharmaceuticals and their potential problems. The current study examines the interaction of the anxiogenic effects of nicotine with the anxiolytic effects of ginseng. Both nicotine and ginseng bind to the nicotinic acetylcholine receptor; however, nicotine is an agonist while ginseng is an antagonist. Anxiety was measured in 40 rats using an elevated plus maze and open field test. It is hypothesized that this study will support the findings of previous studies and that the anxiolytic properties of ginseng will be more salient than the anxiogenic properties of nicotine.

Supported by: FURSCA

THE ELKIN R. ISAAC ENDOWMENT

The Elkin R. Isaac Endowed Lectureship was created in 1991 by Albion College alumni in honor of their former teacher, coach, and mentor, Elkin R. "Ike" Isaac, '48. Isaac taught at Albion from 1952 to 1975 and coached basketball, track, and cross country. He led his teams to one Michigan Intercollegiate Athletic Association basketball title, six consecutive league championships in track, and three cross country championships. He also served as the College's athletic director and created Albion's "Earn, Learn, and Play" program and the "Albion Adventure Program." In 1975, Isaac joined the faculty at University of the Pacific and became athletic director in 1979. He retired there in 1984. He now lives in Kalamazoo, Mich., with his wife, Edith.

Reflecting Elkin Isaac's lifelong interests in higher education and research, proceeds from the endowment are used to bring a noted scholar or public figure to campus each year to offer the Isaac Lecture and to visit with classes. In 1997, the Isaac Lectureship was expanded and is now associated with Albion College's annual Student Research Symposium, featuring presentations by students recommended by their faculty sponsors for outstanding independent study and research. The symposium now bears Isaac's name.

THE ISAAC ENDOWMENT COMMITTEE

Cedric W. Dempsey, '54
Ben E. Hancock, Jr.
T. John Leppi, '59
Thomas G. Schwaderer, '56
Leonard F. "Fritz" Shurmur, '54 (deceased)
John R. Taylor, '55

THE JOSEPH S. CALVARUSO KEYNOTE ADDRESS ENDOWMENT

Joseph S. Calvaruso, '78, and his wife, Donna, established an endowment fund in 2005 to support the annual Elkin R. Isaac Symposium keynote address. The keynote address now bears Calvaruso's name.

An Albion native, he entered the banking profession shortly after graduating from Albion College in 1978, and he currently serves as senior vice president and director of risk management for Mercantile Bank in Grand Rapids. He has also held numerous leadership roles in professional organizations, including the Risk Management Association.

Active in the Republican Party on the state and national levels, Calvaruso is a member of the Gerald R. Ford Institute for Public Policy and Service Visiting Committee at the College.

In keeping with Calvaruso's personal goal to "try different things in life," the keynote endowment ensures the symposium will continue to provide an exceptional variety of presenters from the arts, sciences, social sciences, and humanities.

PAST ISAAC SYMPOSIUM SPEAKERS

Elkin R. Isaac Alumni Lecture

Emilio DeGrazia, '63 (1999)
James Misner, '66 (2000)
John Vournakis, '61 (2001)
Joseph Serra, '56 (2002)
Denise Cortis Park, '73 (2003)
John Porter, '53 (2004)
Elkin Isaac, '48 (2005)

Joseph S. Calvaruso Keynote Address

Wade Davis (1999)
Stephen Jay Gould (2000)
Doris Kearns Goodwin (2001)
Kurt Vonnegut (2002)
Salman Rushdie (2003)
Gloria Steinem (2004)
Edward O. Wilson (2005)

THE 2006 ISAAC STUDENT RESEARCH SYMPOSIUM COMMITTEE

Morris Arvoy (Communications Office)
Craig Bieler (Chemistry)
Sarah Briggs (Communications Office)
Jeffrey Carrier (Biology)
Gene Cline (Philosophy/Brown Honors Institute)
Jennifer Cook (FURSCA)
Ben Hancock (Institutional Advancement)
Lauren Karcz, '08
Lisa Lewis (Chemistry/Brown Honors Institute)
Beth Lincoln (Academic Affairs, Geology)
Anne McCauley (Art and Art History)
Rachel Ransom, '08
Larry Steinhauer (Economics and Management)
Michael Van Houten (Stockwell-Mudd Libraries)
Royal Ward (Academic Affairs)

FOUNDATION FOR UNDERGRADUATE RESEARCH, SCHOLARSHIP, AND CREATIVE ACTIVITY (FURSCA)

The Foundation for Undergraduate Research, Scholarship, and Creative Activity (FURSCA) was established to promote and support student research, original scholarship, and creative efforts in all disciplines. Through a number of programs, taking place at all points in a student's career at Albion, FURSCA can help students pursue independent study in their areas of interest. Students work closely with a faculty mentor to develop and carry out research or other creative projects. Participation in such projects provides valuable experience beyond the scope of classroom work, and enhances a student's preparedness for future employment or graduate studies. Some examples of FURSCA programs are listed below.

Student Research Partners Program—Geared toward first-year students, this program pairs a student with a faculty mentor to work on a project related to the faculty member's research or creative area. Students gain hands-on experience with scholarship in a specific field, and may elect to continue during their sophomore year. Participation is selective, based on high academic achievement, and stipends are awarded.

Research Grants—Students may apply for funds to support research or other creative projects. Students must work closely with a faculty adviser; however, projects are not limited to any particular discipline. Grants may be awarded to pay for supplies, printing costs, subject payments, software, or other costs associated with completion of the project.

Travel Grants—Students may be awarded travel funds to help cover expenses associated with travel to attend professional meetings at which they will present the results of their research or creative projects.

Summer Research Fellowship Program—A select number of students may remain on campus during the summer, earning a stipend, to work on research or creative projects. In addition to working closely with a faculty adviser, students participate in weekly seminars with other students in the program.