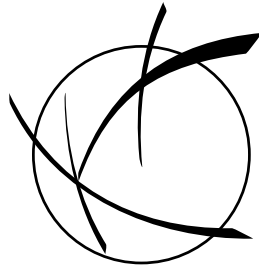


ELKIN R. ISAAC

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THE ELEVENTH ANNUAL ELKIN R. ISAAC STUDENT RESEARCH SYMPOSIUM

ALBION COLLEGE
APRIL 17-18, 2000

Schedule of Events

Monday, April 17, 2000

7:30 p.m. The Elkin R. Isaac Lecture: James E. Misner, '66
'From Fat to Fit: Reflections on Exercise, Nutrition, and Weight Control'
Welcome: President Peter T. Mitchell, '67
Opening Remarks: Elkin R. Isaac, '48, and Thomas G. Schwaderer, '56
Speaker Introduction: Timothy H. Williams
Bobbitt Visual Arts Center Auditorium

Tuesday, April 18, 2000

8:30-10:15 a.m. Symposium Platform Presentations
Refreshments will be served at each location listed below, 8:15 a.m.
See also detailed schedule of presentations on pages 4-5.

- Social Sciences Forum
Norris Center 108
Humanities and Fine Arts Forum
Bobbitt Visual Arts Center Auditorium
Natural Sciences and Mathematics Forum
Norris Center 103

10:40 a.m.-Noon Honors Convocation
Goodrich Chapel

1:15-2:15 p.m. Symposium Poster Presentations
Gerstacker Commons, Kellogg Center

2:15-5:00 p.m. Symposium Platform Presentations
See locations listed for morning session.
Refreshments will be served at each location, 2:00 p.m.

7:00 p.m. Symposium Keynote Address: Stephen Jay Gould
'Geological Immensity and Human Insignificance:
The Proper Scale of Our Ecological Crisis'
Welcome: Peter T. Mitchell
Speaker Introduction: Jeffrey C. Carrier
Goodrich Chapel
Immediately following the address, a reception and book-signing will be held in the
Kellogg Center.

Wednesday, April 19, 2000

9:00 a.m. Rocks of Ages: Science and Religion in the Fullness of Life
Stephen Jay Gould
Norris Center 101



The Elkin R. Isaac Lecture

JAMES E. MISNER, '66



Kinesiologist James E. Misner, '66, has been an educator and researcher in the areas of physical fitness and exercise for nearly 30 years. He is currently professor of kinesiology at the University of Illinois in Champaign. In addition to directing numerous research projects for the University of Illinois, Misner has conducted research for the American Heart Association, the Illinois Association for Health, Physical

Education and Recreation, and the Champaign-Urbana Mass Transit District. Misner has worked as a consultant for some two dozen different government and business organizations, including the Illinois Association of Boards of Police and Fire Commissioners, the Civil Service Commissions of Champaign, Illinois and New York City, the civil service system for Illinois universities, and the University of Illinois Medical School. Misner has also served as an expert witness in four court cases.

Currently, Misner serves as a consulting editor of the *Journal of the National Intramural-Recreational Sports Association* and as editor of the *Illinois Journal of Health, Physical Education, and Recreation*. He has contributed more than 50 articles to these and many other professional journals in the U.S., Europe, and Australia. Misner has also contributed to dozens of research abstracts, reports, and manuals, co-authored a book and instructional software, and has given nearly 75 presentations to professional conferences. Since 1978, he has been recognized 14 times on the Chancellor's List of teachers ranked as excellent by their students.

Misner joined the faculty at the University of Illinois shortly after receiving his doctorate there in 1971. Misner holds a master's degree from the University of Arizona in Tucson. He is married to Marilyn Spitler Misner, '68, and they have two daughters, Kristin Misner, '96, and Anne.

Symposium Keynote Address

STEPHEN JAY GOULD



A brilliant interpreter of science and its complex social consequences, Stephen Jay Gould speaks internationally on a broad range of controversial subject matter, from the scientific arguments for racial equality, to theories on the nature of excellence, to mankind's amazing—but not miraculous—origins, to Darwin's revolutionary breakthrough in thought.

Gould is especially interested in mathematical problems of growth and form applied to the evolution of lineages. He has taught at Harvard University since 1967 and is now professor of geology, Alexander Agassiz Professor of Zoology, and curator for invertebrate paleontology in the university's Museum of Comparative Zoology.

The author of more than 200 consecutive essays for his *Natural History Magazine* column, "This View of Life," Gould is also a contributor to *Discover Magazine*. Gould has served as the president of the Paleontological Society and the Society for the Study of Evolution. He was in the first group awarded the prestigious MacArthur Foundation Prize Fellowship. He has also received the Silver National Medal of the Zoological Society of London and the Edinburgh Medal from the city of Edinburgh. He won the National Magazine Award for Essays and Criticism in 1980 and in 1981 received an American Book Award for *The Panda's Thumb* and the National Book Critic's Circle Award for *The Mismeasure of Man*. *Discover Magazine* named him its Scientist of the Year in 1982.

His other books include: *Full House*, *Ever Since Darwin*, *The Flamingo's Smile*, *Hen's Teeth and Horse's Toes*, *An Urchin in the Storm*, *Wonderful Life*, *Bully for Brontosaurus*, and *Dinosaur in a Haystack*.

Gould holds an A.B. degree from Antioch College and a Ph.D. from Columbia University.



Schedule of Presentations—Tuesday, April 18, 2000

SOCIAL SCIENCES FORUM—Norris Center 108

8:30	Erik Love and Craig Olzak (Berkey)	Identifying Masculinity in Albion Middle School Boys
8:45	Kelly Sear (Franzen)	The Role of Sexual Assault Nurse Examiners in Sexual Assault Treatment and Prosecution
9:00	Olivia Davila (Hayes)	Perceptual Development in Elementary School-Aged Children
9:15	Sarah Rosin (Keyes)	Identifying Risk Factors for Eating Disorders
9:30	Sally Lane (Hayes)	Gender and Handwriting
9:45	Amy Sheele (Franzen)	The Importance of Women's Literacy
10:00	Anne Kretzmann (Saltzman)	Listening to the Rank and File
2:15	Amy Wasiak (Keyes)	The Long-Term Effect of Bereavement on Health
2:30	Caroline Scott (Rubio)	The Development of Representational Mathematics in Early Childhood
2:45	Emily Mull (Otto)	The Effect of Victim Age and Relationship to Assailant on Attribution of Blame in Rape Cases
3:00	Jennifer Barr (Otto)	The Internet as a Research Tool: A Web-Based Conflict Simulation
3:15	Christopher Peterson (Berkey)	Constructing Masculinity
3:30	Tia Konzer (Hayes)	The Effects of Social Desirability, Gender, Relation, and Age on Apologies
3:45	Kristin McCauley (Berkey)	"Hispanic" Identity
4:00	Emily Line (Keyes)	Social Environment of a Juvenile Correctional Facility
4:15	Sarah Grill (Otto)	Perceptions of the Legal Justice System
4:30	Britt Wegener (Berkey)	The Bi-Racial Self
4:45	Michael Mara (Purnell)	The Future of Affirmative Action

HUMANITIES AND FINE ARTS FORUM – Bobbitt Visual Arts Center Auditorium

8:30	Scott Smith (Christiansen)	An Evaluation of the Acid Rain Program
8:45	Marnie Harte (Levine)	Personal Watercraft Regulation: The Pluses and Minuses of Industry-Proposed Legislation
9:00	Kyle Kramer (Dick)	From FDR's New Deal to LBJ's War on Poverty: A Look at Access to Health Care in Twentieth-Century America
9:15	Brian Longheier (MacInnes)	Albion and Corporate America: A Local Industry's Struggle to Survive
9:30	Melissa Peterson (Cocks)	O Let Me Be the Voice: An Analysis of Women's Roles in the Holocaust
9:45	Sharon Finnegan (Cocks)	Jewish Resistance to the Holocaust Defined and Illustrated
2:15	Chandra Thomas (Wyss)	Tracing History: Journey of the Drums, African Dance, and Its Influence on More Contemporary Forms of Dance
2:30	Amy Reimann (Wickre)	Dominick Labino: A Study of Development
2:45	Jennifer Campbell (Chavez)	On the Tracks
3:00	Misty Hensley and Nathan Piwowarski (Diedrick)	Upton Sinclair and the American Surveillance State
3:15	Chad Kurzawski (Chavez)	Sunday Today: A Collection of Poetry and Devotionals
3:30	Andrew Kolozsvary (Collar)	Representations of Missionaries
3:45	Molly Kerstetter (McNab)	Creating an Escape World in Laura Esquivel's <i>Como agua para chocolate</i> and Isabel Allende's <i>La casa de los espiritus</i>
4:00	Carl Gladstone (Chavez)	Gems and Unicycles
4:15	Heather Schmidt (Frick)	Research Genesis: A Comparative Approach to the Fall of Man
4:30	Rebecca Little (Collar)	Re: Imaginings—Vision and Cosmology in Gloria Naylor's Texts
4:45	Phillip Reed (Cook)	The Military, Religious, Political, and Economic Reforms of Diocletian: Proto-Socialism and Feudalism in the "New Roman Empire"



NATURAL SCIENCES AND MATHEMATICS FORUM—Norris Center 103

8:30	Jovan Giaimo (Bieler)	Fluorescence Study of MALDI Matrix Compounds
8:45	Erin Marasco (Saville)	Using PCR-RFLP of Major Histocompatibility Class II Genes for Genetic Analysis of Nurse Shark Populations
9:00	Michelle Lesperance (Kennedy)	Male House Wrens Respond More Strongly to Song Playbacks of Strangers than of Neighbors during the Nestling Period
9:15	Karen Doral (Skean)	Taxonomic Placement of Puerto Rican <i>Leandra</i> (Melastomataceae: Miconieae) Based on Internal Transcribed Spacer (ITS) Nuclear Ribosomal DNA Sequences
9:30	Kaitlyn Kelly (Pearson)	Involvement of a Pheromone in Selection of Oviposition Site in the Blowfly, <i>Phormia regina</i>
9:45	Joslyn Brunelle (Saville)	The Molecular Characterization of DNA Damage Caused by Movement of the hobo Transposable Element in <i>Drosophila melanogaster</i>
10:00	Gretchen Gockerman (Kennedy)	Effects of Seed Preferences and Distance to Cover on Foraging Black-capped Chickadees
2:15	Janna Muccio (Pearson & French)	An Attempt to Isolate the Male Mating Pheromone of <i>Agelenopsis aperta</i>
2:30	Jennifer Hoppe (Klarr)	Is Endothelium-Dependent Vasodilation in Smooth Muscle Dependent on Functional HSP90?
2:45	Benjamin Smith (Skean)	Vascular Flora and Plant Communities in the Vicinity of the Doty Wildflower Trail, Baker Sanctuary, Calhoun County, Michigan
3:00	Sean McCuddy (Wilch)	Petrographic and Geochemical Analysis of Volcanic Rocks from Mount Takahe, West Antarctica: Implications for Higher Paleo-ice Levels and Global Sea-level Change
3:15	Jennifer Lueken (Kennedy)	Feeding by Female and Male House Wrens at Different Stages during the Breeding Season
3:30	Eleanora Maries (Saville)	The Development of a Method for Paternity Testing in the Nurse Shark Using PCR-RFLP and Comparative DNA Sequence Analyses of Major Histocompatibility Class II Alpha Genes
3:45	Jessica Lueken (Kennedy)	Singing Rates of Male House Wrens at Different Stages of the Breeding Season in a Double-brooded Population in Michigan
4:00	Nicholas Whitney (Carrier)	Applications of Ultrasonic Telemetry to the Study of Nurse Shark (<i>Ginglymostoma cirratum</i>) Reproductive Behavior
4:15	Melanie King (Wilson)	Muscarinic M1 Involvement in Working Memory in the Rat
4:30	Michelle Sautter (Kennedy)	Heavy Metal Accumulation in Staghorn Sumac (<i>Rhus hirta [=typhina]</i>) in the Albion Area
4:45	Paul DeRose (Saville)	The Use of Transposable Elements to Investigate Double-Strand Break DNA Repair in <i>Drosophila melanogaster</i>

POSTER PRESENTATIONS—Gerstacker Commons, Kellogg Center, 1:15 -2:15 p.m.

Beth Albery, Kathryn Bretz, and Kara Ganota (Rubio)	How We Made a Digital Portfolio
Mark Ams and Jennifer Kuebler (Malinak)	A Proposed Synthesis of a New Metallomesogen
Elizabeth Duvall and Kami Marsack (Kennedy)	Movements of Black-capped Chickadees in Whitehouse Nature Center
Matthew Gray (Williams)	A Comparative Study of the Effect of Superhydration on Muscular Strength during Weight Training
Rachel Hector (French)	Chiral Hypervalent Iodine Reagents: Studies at Albion College and Basel, Switzerland
Holly Jacobs (Reimann)	Simulating the Effects of Various Parameters on the Measurement of the Two-Dimensional Modulation Transfer Function Using Wiener Filtering
Andrea Johnson (Brumfiel)	Compositional Analysis of Ceramics from Lake Xaltocan, Mexico: The Influence of Epiclassic Regional Centers on Small Satellite Sites in the Basin of Mexico
Kirsten Jones (Seely)	The Construction of a Computer Interface and a Closed-Loop Water System for a Portable Accelerator Apparatus
David Kenyon (T. Lincoln)	Preliminary Investigation of the Controls on the Temperature of the Kalamazoo River near Albion, Calhoun County, Michigan
Deirdre Lindemann (Lewis)	Effect of Ethanol on the Photodegradation of CCl_4 in Aqueous Solutions by TiO_2
Eleonora Maries (Klarr)	Women's Access to Health Insurance
Elizabeth Mettler (Sedersten)	A Kinematic Analysis and Electromyographic Study of the Infraspinatus in the Float Serve in Volleyball: A Case Study
James Smaby (Bieler)	Computational Study of the Reactive Potential Surface of Carbon Dioxide Dimer



BETH ALBERY, '00
KATHRYN BRETZ, '00
KARA GANOTA, '00

How We Made a Digital Portfolio

Faculty Sponsor: Reuben Rubio

Beth Albery, '00
 Major: English, Elementary Education
 Certification
 Hometown: Waterford, Mich.

Kathryn Bretz, '00
 Major: English, Elementary Education
 Certification
 Hometown: Highland, Mich.

Kara Ganota, '00
 Major: English, Elementary Education
 Certification
 Hometown: Miamisburg, Ohio



Albery



Bretz



Ganota

When searching for a job, all educators carry with them a portfolio. This portfolio is an attempt to summarize what one has taught, what one values as a teacher, and what one's educational philosophy is. We have decided to go one step further in our creation of this idea by developing a digital portfolio. This is a portfolio that contains all of the necessary parts and also uses technology to present the information. The final copy of a digital portfolio is presented as a CD-ROM so that the information given is viewed with a computer.

Before creating our portfolios, we decided how we wanted to display our information. Using the software Claris Homepage we began mapping out our digital portfolios. We used frames to create a useful navigation system. Frames allow for the display of the table of contents throughout the portfolio, so that it appears on every page. With frames the reader can jump from area to area as they view the portfolio. Readers can also be guided through the portfolio page by page. This will ensure that they see the entire portfolio. After the portfolio is structured, it should be designed so that it best represents the author.

With a digital portfolio, we can display our professional knowledge, experiences, and abilities. This portfolio will showcase evidence of our growth and achievement in the classroom. It includes our resume, letters of recommendation, academic papers, and our philosophy of teaching. The portfolio presents lesson plans, units, pictures, and samples of student work that connect the written plans to the actual carrying out of the lessons in the classroom. A digital portfolio makes a bold statement about our technological ability. Technology is becoming increasingly important in education, and it cannot be implemented in the classroom without teachers who know how to use it.

MARK AMS, '02
JENNIFER KUEBLER, '02

A Proposed Synthesis of a New Metallomesogen

Faculty Sponsor: Steven Malinak

Mark Ams, '02
 Major: Chemistry
 Hometown: Almont, Mich.

Jennifer Kuebler, '02
 Major: Chemistry
 Hometown: Ossineke, Mich.

Metallomesogens are a type of liquid crystal that contains one or more metal ions. In the liquid crystalline state, magnetic interactions between these paramagnetic metal centers



Ams



Kuebler

may lead to useful chemical applications. We propose a synthesis for a metallomesogen that can contain as many as five uncoupled paramagnetic centers. Preparation of these complexes is dependent on the multi-step synthesis of functionalized multidentate ligands. An overview and our progress will be presented.

JENNIFER BARR, '00

The Internet as a Research Tool: A Web-Based Conflict Simulation

Faculty Sponsor: Amy Otto

Major: Psychology, Public Service
 Concentration
 Hometown: Pittsford, Mich.



Both employees and employers are interested in what factors affect conflict resolution style. Does the type of conflict influence the resolution choice? Does the conflict style of the organization as a whole influence the employee's style for conflict resolution? Do higher-status, higher-paid employees use different methods to solve conflicts? The purpose of this study is to examine the factors underlying conflict resolution in the workplace. The present study is unique for a variety of reasons. The bulk of early research on conflict resolution focused only on formal mechanisms and was based in the legal system. This project includes both informal and formal mechanisms as well as presenting multiple



decisions concerning the allotted conflict (three choices compared to one) through a Web-based simulation.

Earlier conflict studies used paper-and-pencil scenarios to describe the organization and the conflict situation. With the Internet, photos and sound produce a more lifelike representation, therefore contributing to greater external validity. Approximately 110 subjects (40 college students, 40 manufacturing employees, 30 clerical staff) will be guided through the Web-based simulation focusing either on a relationship conflict or resources conflict (e.g., unequal distribution of computers). Subjects will also be asked to complete a short survey concerning the conflict resolution style of their employer. The results will provide a better understanding of the conflict resolution process and utilize technology in the research arena.

KATHRYN BRETZ, '00

(See Beth Albery, '00, Kathryn Bretz, '00, and Kara Ganota, '00)

JOSLYN BRUNELLE, '00

The Molecular Characterization of DNA Damage Caused by Movement of the hobo Transposable Element in *Drosophila melanogaster*

Faculty Sponsor: Kenneth Saville

Major: Biology
Hometown: Kimball, Mich.



The hobo element is a transposable element which contains short inverted repeat sequences at its termini. Transposable elements, sometimes referred to as jumping genes, can integrate into many different sites of the genome of *Drosophila melanogaster*. The action of a protein called transposase causes the hobo element to be removed or excised from its place in the genome and reintegrated in a new site. The excision of the hobo element

creates breaks in the DNA, which consequently undergo some mechanism of repair. Atkinson et al. (1993) compared the structure of DNA sequences from hobo excision products, finding that the entire hobo element and a small number of nucleotides flanking the hobo element were lost during excision. Additional nucleotides were also added at the deletion breakpoints and appear to be related to the genomic DNA sequences originally flanking the hobo element. It is important to note that the excision of hobo is imprecise, since several unique DNA sequences were found. DNA is known to be repaired by three main mechanisms: homologous recombination, single strand annealing, and nonhomologous end joining (NHEJ). The sequences found at the hobo excision site suggest NHEJ as the likely repair mechanism in this case. In this study, molecular techniques were used to amplify, isolate, and compare hobo excision products in order to further analyze how double-strand DNA breaks are repaired.

JENNIFER CAMPBELL, '00

On the Tracks

Faculty Sponsor: Lisa Chavez

Major: English
Hometown: Merrill, Mich.



"On the Tracks" is a novella about a college student dealing with depression. The reader is taken through a chapter of Jordan's life as she deals with a strained friendship with her roommate, Emily, that grows strong again when Emily is the victim of date rape. Rumors begin to fly, and Jordan is left on campus to deal with the comments and the fear, as well as the fact that the rapist was a good friend of hers. Jordan struggles to remain strong for her friend, and all the while she becomes more and more depressed. Nobody notices what is going on with Jordan until it is almost too late.

I think this is an important story to tell because it deals with two issues which are, or can be, prevalent in the college community. Date rape happens, and no one ever hears about the people who are left behind when the headlines go away. Also, depression all too often goes unnoticed and unrecognized. My purpose is to explore these issues and publicize them, thereby bringing the issues into the open where they should be.

OLIVIA DAVILA, '00

Perceptual Development in Elementary School-Aged Children

Faculty Sponsor: William Hayes

Major: Psychology
Hometown: Midland, Mich.



In this study of perceptual development, 66 elementary school-aged children were examined. Twenty first-graders, 22 third-graders, and 24 sixth-graders were shown two optical illusions

from "Exploring Perception," a CD-ROM containing information and interactive programs written by Colin Ryan in 1997. One illusion demonstrates the motion aftereffect, and the other demonstrates causality and the launching effect. Individually, each child was shown the optical illusions and, afterwards, was asked the extent to which he or she experienced the illusions. It was hypothesized that the older the children were, the more affected by the optical illusions they would be. Results show a significant difference between the responses of the children of each grade and also show that the older the children were, the more affected they were by the illusion.

**PAUL DeROSE, '00****The Use of Transposable Elements to Investigate Double-Strand Break DNA Repair in *Drosophila melanogaster***

Faculty Sponsor: Kenneth Saville

Major: Biology
Hometown: Kimball, Mich.

The P and hobo elements generate double-strand DNA breaks upon excision, but these breaks appear to be repaired by distinct DNA repair mechanisms. DNA breaks generated by the P-element are

repaired by a template-dependent DNA repair mechanism, whereas hobo-generated breaks appear to be repaired by a mechanism similar to that involved in V(D)J recombination in mammalian lymphocytes, which involves covalently closed DNA hairpin intermediates. We describe a genetic system utilizing both the P and hobo transposable elements to identify genes involved in one or both of these DNA repair mechanisms. In initial experiments, P and hobo excision rates will be monitored in a mus309 mutant background. Mus309 has previously been shown to be required for the efficient repair of P-element generated DNA breaks (Beall and Rio, 1995), and thus provides an excellent test of our genetic system. Our hypothesis is that mus309 encodes a general DNA repair protein in *Drosophila*, and as such will be required for the repair of hobo-generated DNA breaks. This hypothesis leads to the prediction that hobo excision rates will be reduced in a mus309 mutant background.

KAREN DORAL, '99**Taxonomic Placement of Puerto Rican *Leandra* (Melastomataceae: Miconieae) Based on Internal Transcribed Spacer (ITS) Nuclear Ribosomal DNA Sequences**

Faculty Sponsor: Dan Skean

Major: Biology
Hometown: Rochester, Mich.

Leandra krugii (Cogn.) Judd & Skean and *L. krugiana* (Cogn.) Judd & Skean are montane shrubs or small trees endemic to Puerto Rico traditionally treated as *Calycogonium krugii* Cogn. and

Ossaea krugiana Cogn. Current generic classification was proposed in 1991 from morphological comparisons with species of *Leandra* Raddi, previously considered a continental genus absent from the West Indies. To test the hypothesis that the 1991 classification would be supported by cladistic analysis of ITS nuclear ribosomal DNA sequences, these were obtained from *L. krugii*, *L. krugiana*, *Sagraea umbrosa* (Sw.) DC., and *Mecranium latifolium* (Cogn.) Skean from Puerto Rico, *Calycogonium hispidulum* Cogn. from Hispaniola, and *L. mexicana* Cogn. and *Miconia militis* Wurdack from Mexico. The ITS1, 5.8S, and ITS2 sequences are 250 bases, 168 bases, and 223 bases long respectively. Analysis was conducted using PAUP v. 4.0b2 with *M. militis* as the out-group. A branch-and-bound search yielded one most parsimonious tree 137 steps long [CI=0.869; RC=0.457; RI=0.526]. The two Puerto Rican *Leandra* species link most closely with *L. mexicana*, which supports the 1991 classification.

**ELIZABETH DUVAL, '03
KAMI MARSACK, '02****Movements of Black-capped Chickadees in Whitehouse Nature Center**

Faculty Sponsor: Dale Kennedy

Elizabeth Duvall, '03
Major: Biology
Hometown: Lenox Township, Mich.Kami Marsack, '02
Major: Undeclared
Hometown: Hinsdale, Ill.

Duvall



Marsack

Black-capped Chickadees (*Poecile atricapillus*) are resident birds that utilize winter bird feeders in Whitehouse Nature Center (WNC). At other sites, winter flocks of chickadees have been found to vary in size from 3-12 members and to vary in cohesiveness, with some areas having coherent flocks of constant membership while other areas have flocks with no apparent coherence. Since fall 1997, more than

80 chickadees have been caught in WNC and given unique combinations of colored leg bands to indicate the feeder nearest where each bird was initially captured and to allow recognition of individual birds. We used observational data collected between fall 1997 and spring 2000 to examine: (1) whether individual birds showed site tenacity to specific feeders; and (2) the levels of coherence among birds at individual feeders spread throughout WNC. Using data collected in 1997-1999, we found that return rates of birds banded at different feeders in the previous year ranged from 25-100%, with 100% return occurring among birds banded at the feeder behind the interpretive center



(the only feeder up year-round). Feeding group size ranged from 4-11 birds, and 66% of birds that were reseen showed site tenacity to the feeder near where they had initially been banded. Average coherence values (estimates of time each bird spent with another bird) for groups at different feeders ranged from 0.3-0.5. Additional data from the 1999-2000 field season will be analyzed and presented.

SHARON FINNEGAN, '00

Jewish Resistance to the Holocaust Defined and Illustrated

Faculty Sponsor: Geoffrey Cocks

Major: History

Hometown: Grand Rapids, Mich.



The first works exploring Jewish reactions to the Holocaust were written from the standpoint that the Jews went to their deaths "like sheep to the slaughter." However, historians began to shift their

views as resistance's definition changed and new documentation was found.

Before its extent and effectiveness can be ascertained, resistance itself must be defined. Definitions range from nothing but armed uprising to everything, including simple survival. For the purpose of my studies, I use a definition between these two extremes. Resistance is not exclusively armed uprising, but it must include more than survival.

When resistance was attempted, it always met overwhelming obstacles. Usually resisters were caught and killed. Jews often lacked basic necessities, let alone weapons. Furthermore, the necessity, method, and timing of resistance were debated within the Jewish communities. Once resistance was obviously necessary, it was often too late. Despite obstacles, many Jews did resist. Jewish resistance included everything from document forgery and smuggled goods to escape and armed revolt. Whatever its extent and method, the Jews' resistance should be recognized and admired.

To understand resistance, it must be examined as both a local and universal phenomena, with an examination of the differences of the conditions and the responses within each Jewish community. I have chosen to examine resistance movements in three locations: the Warsaw ghetto, Treblinka death camp, and Vichy, France. I chose these locations because they illustrate three different situations in which the European Jews found themselves, yet resistance existed in each location.

KARA GANOTA, '00

(See Beth Albery, '00, Kathryn Bretz, '00, and Kara Ganota, '00)

JOVAN GLAIMO, '00

Fluorescence Study of MALDI Matrix Compounds

Faculty Sponsor: Craig Bieler

Major: Chemistry

Hometown: Wyandotte, Mich.



The fluorescent properties of several compounds used as MALDI matrices were studied in order to help understand the energy deposition and redistribution in these systems.

MALDI involves a complex process of sample ejection and ionization in which the mechanism is not fully understood. Fluorescence quantum yields of matrix components, such as sinapinic, caffeic, 2,5-dihydroxybenzoic, and alpha-cyano-4-hydroxycinnamic acids, are compared to published MALDI mass spectral intensity values. As one pathway to energy redistribution, fluorescence can hinder the mechanism of vaporization and/or ionization by allowing absorbed energy to dissipate. Compounds were studied both in solution and as films by monitoring the fluorescence at 337 nm excitation.

CARL GLADSTONE, '01

Gems and Unicyles

Faculty Sponsor: Lisa Chavez

Major: English

Hometown: Warren, Mich.



"Gems and Unicyles" is a singer-songwriter endeavor. Each of the original songs contained on the CD will attempt to join both lyric and melodic uniqueness into an exciting audio experience.

All recording and artwork will be self-produced. The project will be perfected through an extended process of writing, revision, and live performances. Songs like "To the House of May" and "Sparrows" are a picture poem that utilizes concrete imagery to describe sometimes outlandish situations. "Gems and Unicyles," as a title, is an attempt to capture the contrast between successful artistic creation, and the ultimate futility of such creations.

GRETCHEN GOCKERMAN, '00

Effects of Seed Preferences and Distance to Cover on Foraging Black-capped Chickadees

Faculty Sponsor: Dale Kennedy

Majors: Biology, English

Hometown: Grand Rapids, Mich.



Factors that affect feeding preferences of birds include food type and predation risk. Foraging Black-capped Chickadees (*Poecile atricapillus*) were examined at feeders in different locations in the

Whitehouse Nature Center (WNC) at Albion College. Popular literature on attracting birds



to feeders suggests that chickadees prefer black oil sunflower and striped sunflower over other types of seed. I examined seed preferences of chickadees through a series of pairwise comparisons, in which birds were offered choices of black oil sunflower, striped sunflower, safflower, mixed seed, and millet. Birds preferred black oil sunflower, followed by safflower and striped sunflower. They selectively picked sunflower seeds out of the mixed seed, and they left most of the mixed seed and the millet uneaten.

Optimal foraging theory suggests that feeding location may be constrained by risk of predation. When given a choice of feeders out in the open versus close to cover, chickadees in WNC more frequently visited feeders near cover if the two food choices were similar in preference, suggesting that predation risk may have influenced foraging location. However, when given a choice of a highly preferred food in the open and a less preferred food near cover, birds fed more at the open feeder, suggesting that food type may in some cases outweigh predation risk in foraging behavior.

MATTHEW GRAY, '00

A Comparative Study of the Effect of Superhydration on Muscular Strength during Weight Training

Faculty Sponsor: Timothy Williams

Major: Physical Education
Hometown: Adrian, Mich.



Strength training has had a significant increase in popularity among both males and females over the past ten years. Significant strength gains have resulted in improvements in athletic performance.

This, in turn, has caused people to look at many ergogenic aids that act as supplements to enhance even further the effects of weight training. Both legal and illegal supplements have been utilized for this purpose.

This study will examine the effects of a legal supplement to weight training that is frequently overlooked. That is hydration. Because protein synthesis requires significant amounts of water for optimal efficiency, superhydration will be examined for its effects on this process. Weight training will be the medium that will be utilized to stimulate this process. The basic premise of this study is that data suggests that most people are considered to be in a somewhat dehydrated state. What will the effects of superhydration be on muscular strength as a result of weight training? That is the question that we hope to answer.

SARAH GRILL, '00

Perceptions of the Legal Justice System

Faculty Sponsor: Amy Otto

Major: Psychology
Hometown: Lansing, Mich.



Recent prominent court cases have led many to question the confidence the public has in the justice system. Despite this, very little research has been done to investigate the public's actual

opinions. In order to gain more insight into the public's perception of the justice system, a questionnaire was developed and sent to a random sample of 500 in Calhoun County. The questions focused on four specific areas. The first area was the public's willingness to serve on a jury. This section was included to help better understand what factors cause people to be willing or reluctant to serve on a jury. The second area was perceptions of overall fairness in the justice system. The third area was opinions on race in the justice system. This section was developed in order to measure the perceptions of how fairly African Americans are treated compared to Caucasians. The final section was perceptions of the media and the justice system. Obtaining opinions of how the media influences potential jurors and how it influences the

fairness of a jury were goals of this section. It was hypothesized that African Americans would view the justice system more negatively and perceive it as more racially biased. It was also hypothesized that those who watch more television would have more negative views toward overall fairness of the justice system. Finally, it was expected that those with a college education would feel a higher responsibility to serve on a jury.

MARNIE HARTE, '02

Personal Watercraft Regulation: The Pluses and Minuses of Industry-Proposed Legislation

Faculty Sponsor: Myron Levine

Major: Political Science
Hometown: East Lansing, Mich.



Since personal watercraft (PWC) first hit waters, they have been attacked on all fronts. Often compared to three-wheelers and snowmobiles, these "water-bikes," of past and present,

have been and continue to be relentlessly criticized. PWC opponents assert that PWC have unacceptably high accident-injury, noise production, and pollution rates. In order to protect their best interests, the Personal Watercraft Industry Association (PWIA), a group comprised of PWC manufacturers, authored the Model Personal Watercraft Operations Act. This model bill laid out guidelines for proper PWC operation, care, etc., and was created with the intent that it would serve as a basis for state regulatory policies.



Through a systematic process of gathering, reviewing, and evaluating data, I have made several analysis-based recommendations regarding the effectiveness of the PWIA bill. Because the Personal Watercraft Operations Act is a model and not an implemented policy, I have evaluated it utilizing information taken from several states. These states, Michigan, California, and Florida, all have PWC policies that closely resemble the PWIA bill, and have the most available information regarding PWC accident-injury, noise production, and pollution rates.

RACHEL HECTOR, '00

Chiral Hypervalent Iodine Reagents: Studies at Albion College and Basel, Switzerland

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Wyandotte, Mich.



A number of experiments were performed on a series of representative alkenes to determine the reactivity and selectivity of an *ortho*-phenylbenziodoxole compound. The activity

of the compound was compared to that of Koser's reagent, (hydroxytyloxy)-iodobenzene, and the compound's selectivity was determined by analysis with a chiral HPLC. In addition, the synthesis of a new chiral hypervalent iodine compound, which is hoped to have a higher selectivity due to increased steric control of the direction of approach, is described.

MISTY HENSLEY, '02 NATHAN PIWOWARSKI, '02

Upton Sinclair and the American Surveillance State

Faculty Sponsor: James Diedrick

Misty Hensley, '02
Majors: Political Science, Computational Mathematics
Hometown: Clarkston, Mich.

Nathan Piwowarski, '02
Majors: Political Science, History
Hometown: Clarkston, Mich.



Hensley



Piwowarski

Misty Hensley and Nathan Piwowarski spent the summer of 1999 researching with James Diedrick (English) for his book-in-progress, *Upton Sinclair: The Radical Years*. Their research covered the basic institutional history of the Federal Bureau of Investigation (FBI) and the American surveillance state, and specifically, how this agency treated one particular leftist, the perennially headline-

making author and political candidate, Upton Sinclair. Hensley examined the FBI's surveillance of American authors, and Piwowarski primarily studied the FBI's 300-page file on Sinclair, which contains surveillance reports, phone tap transcriptions, news clippings, excerpts from books, and correspondence between Sinclair and the bureau's agents. Hensley and Piwowarski's findings shed light on the origins and dangers of the American surveillance state.

JENNIFER HOPPE, '00

Is Endothelium-Dependent Vasodilation in Smooth Muscle Dependent on Functional HSP90?

Faculty Sponsor: Susan Klarr

Major: Biology
Hometown: Midland, Mich.



The role of heat shock protein 90 (HSP90) in nitric oxide synthase (NOS) trafficking in endothelium-dependent vasodilation in blood vessels from hypertensive rats was characterized

using geldanamycin (GA) (10mg/ml), an HSP90 inhibitor, and examining relaxation to acetylcholine (ACh) (10^{-9} M to 10^{-3} M). It was hypothesized that the hypertensive state was a result of lowered levels of HSP90 and not of lowered nitric oxide levels. Rat aortas from DOCA-salt hypertensive and sham normotensive Sprague-Dawley rats were isolated and hung in muscle baths for the measurement of isometric force. After constriction with an EC_{50} of phenylephrine, the vessels were incubated with GA, and then concentration response curves to ACh were performed. Relaxation responses to ACh after incubation with GA were not significantly attenuated as compared to control vessels ($40.3\% \pm 9$ relaxation in GA-treated vessels and $57.6\% \pm 13$ in non-treated vessels), which would have been expected if HSP90 was integral to NOS trafficking. It was observed, however, that the vessels relaxed upon addition of GA, on the order of 20%. Geldanamycin is known to have some raf inhibitory activity, so it is possible that this relaxation was caused by a small GTP-ase such as raf. Further studies are required to determine the exact mechanism of this relaxation response.



HOLLY JACOBS, '01

Simulating the Effects of Various Parameters on the Measurement of the Two-Dimensional Modulation Transfer Function Using Wiener Filtering

Faculty Sponsor: David Reimann

Majors: Computer Science, Economics and Management
Hometown: Fort Wayne, Ind.



A new method for the measurement of modulation transfer function (MTF) using Wiener filtering is presented. The method, unlike conventional methods using slit or edge devices,

allows the direct determination of the MTF in all directions at one step. An image containing a precise circular region is acquired, and its Fourier transform is calculated. In the absence of any blurring, the Fourier transform yields a simple Bessel function. Because of the symmetry in the convolution theorem, the roles of the blurring function and object can be interchanged, allowing the blurring function to be recovered using a Wiener filter. This process was simulated in order to understand the effects of attenuation, signal-to-noise ratio, and circle size. Images were simulated containing a circular region and degraded by spatial domain blurring with a Gaussian convolution kernel and by additive Poisson noise. The determined MTF matches the expected MTF except for a slight high frequency overestimate due to noise aliasing, which can be compensated. This method allows one to easily measure the two-dimensional MTF, particularly in systems which have an asymmetrical point spread function such as computed radiography. A comparison is currently under way between this method and conventional MTF measures based on experimental data from a computed radiography system. The method can be used

as a tool for quality assurance and for comparing the resolution characteristics of various digital radiography systems.

ANDREA JOHNSON, '00

Compositional Analysis of Ceramics from Lake Xaltocan, Mexico: The Influence of Epiclassic Regional Centers on Small Satellite Sites in the Basin of Mexico

Faculty Sponsor: Elizabeth Brumfiel

Majors: Anthropology, Biology
Hometown: Okemos, Mich.



In 1997, Elizabeth Brumfiel and her crew conducted a surface survey and excavated two test pits at Michpilco, a Classic (100-700 C.E.) and Epiclassic (700-900 C.E.) period site north of Xaltocan, Mexico.

The small size of the site, the lack of evidence of large-scale ceramic production and permanent living structures, and the limited diversity of vessel forms may indicate that Michpilco was a seasonally occupied hunting ground. While decorated wares link this site with the ceramic markets of Epiclassic period urban centers, Teotihuacan and Cuauhtitlan, the site's overall limited diversity of ceramics raises several questions as to how Michpilco fit into contemporaneous inter-regional organizations. Was Michpilco a satellite community, tightly linked to the political hierarchies and/or market economies of larger provincial and urban centers of the time, or does the site represent a relatively independent population?

It is the goal of this project to determine the economic autonomy of Michpilco and, in turn, examine the organization of Epiclassic hinterland populations. With the cooperation of the Instituto Nacional de Antropología e Historia and the Ford Nuclear Reactor at the University of Michigan, I am currently performing instrumental neutron activation analysis (INAA) on selected ceramic samples from the site. INAA

provides data on trace elemental composition of ceramic pastes and is used to examine ceramic origins through the identification of probable clay sources.

If a single, dominant paste cluster occurs in the case of Michpilco this would imply that its inhabitants participated in the exchange market of a major center such as Teotihuacan or Cuauhtitlan. On the other hand, multiple paste clusters of equal size would imply exchange activity in a number of different markets, a pattern more indicative of an autonomous group, where individuals are able to make their own economic decisions.

KIRSTEN JONES, '03

The Construction of a Computer Interface and a Closed-Loop Water System for a Portable Accelerator Apparatus

Faculty Sponsor: David Seely

Major: Physics
Hometown: Grand Rapids, Mich.



I designed and constructed a computer interface and aided in the construction of a closed-loop water-cooling system for a portable accelerator apparatus, which will be used to study interac-

tions between laser light and negative ions. More specifically, this apparatus is intended for the study of the liberation of electrons by laser light, a process called photodetachment, and the study of electron emission from solids due to collisions with fast ions, a process called secondary electron emission. The computer interface to the entire apparatus was written using LabVIEW® data acquisition software configured to communicate with devices using the general purpose interface bus (GPIB) hardware communications protocol. At present, the data acquisition program controls and reads several instruments, including a bipolar power



supply, several digital multimeters, several digital timers, and a digital picoammeter. The program has been designed to accommodate additional instruments in the future.

I also constructed a closed-loop water-cooling system designed to cool multiple components of the apparatus by water convection; attention was paid to making the cooling system modular, so that components can be isolated and removed. In the future, the data acquisition software will monitor the pressure and flow rate of the water system.

KAITLYN KELLY, '00

Involvement of a Pheromone in Selection of Oviposition Site in the Blowfly, *Phormia regina*

Faculty Sponsor: Gwen Pearson

Majors: Chemistry, Spanish
Hometown: Escanaba, Mich.



It has been assumed that carrion flies oviposited in groups for a variety of benefits, both thermal and defensive, and that pheromones mediate this aggregation.

However, it is also possible that the aggregation of larvae in carrion is simply due to the patchy distribution of that resource. A choice test was used to measure the preference of female blowflies to liver samples with and without conspecific eggs. Sixty-two percent of the flies tested chose the egg-laden liver, which was significantly different than a plain binomial distribution expected under the null hypothesis of no preference ($N=245$; $P=0.0001$). Because the flies were tested in paired samples, the Wilcoxin Signed Ranks test was also used as a more rigorous test of significance ($Z=-2.402$; $N=13$; $P=0.016$). We conclude that there is evidence that female flies prefer sites of previous oviposition for egg-laying, and are now working on isolating the semiochemicals that mediate this response.

DAVID KENYON, '00

Preliminary Investigation of the Controls on the Temperature of the Kalamazoo River near Albion, Calhoun County, Michigan

Faculty Sponsor: Timothy Lincoln

Major: Biology, Environmental Sciences Concentration
Hometown: Adrian, Mich.



Water temperature in a river is both an important environmental variable and an indicator of the amount of groundwater discharging into the stream. Water temperatures are

mediated largely by surface processes and by temperature and discharge differences between surface and ground waters. In this study, temperature variations of water and sediment in the Kalamazoo River were investigated, both in time at fixed locations, and in space along the river. A cyclical pattern was seen between daily temperatures of air and water. The water temperature consistently lagged behind the air temperature in both summer and winter temperature studies. Subtle temperature variations were also found at different locations along the river. The causes of these variations may be underwater springs that discharge into the river. Zones of high groundwater discharge are expected to be related to surrounding topography of the land; this hypothesis has not yet been tested. A detailed study of sediment temperature in one area of suspected discharge showed a distinct area with sediment temperatures up to 8°C lower than that of the river water, suggesting a localized source of cold groundwater discharge. These initial studies show that temperature studies can be used to locate zones of exceptional groundwater discharge.

MOLLY KERSTETTER, '00

Creating an Escape World in Laura Esquivel's *Como agua para chocolate* and Isabel Allende's *La casa de los espíritus*

Faculty Sponsor: Pamela McNab

Majors: Biology, Spanish
Hometown: Kent, Ohio



Como agua para chocolate, by Laura Esquivel, and *La casa de los espíritus*, by Isabel Allende, are two novels that explore the ways in which women characters respond to the roles tradition imposes

on them. This paper will focus on specific women characters from each novel, examining the similarities and differences in the ways that each character strives to maintain her spirit in the face of a life structured by external norms.

In *Como agua para chocolate*, family tradition demands that Tita, the youngest daughter, take care of her disagreeable mother until her death. Consequently, Tita is denied the expression of her own individuality and any chance of a relationship with her true love, Pedro. In *La casa de los espíritus*, Clara is born into a family structure where marrying and having children are a woman's duty, although her spirit rejects the mundane lifestyle of the woman as wife and mother. In spite of their similar situations, Tita and Clara are two distinct characters: Tita wishes she could marry and have children while Clara dreams of a world separate from the one which her husband and children inhabit. Nevertheless, both characters create their own space apart from the physical world in which they exist in order to survive within the confines imposed upon them by their families and society in general.

This paper will discuss those mechanisms by which the two characters create their own escapes from the oppression, violence, and the rigid power structures that mandate the paths their lives must follow. Esquivel and Allende create spiritual outlets



for Tita and Clara in two ways. First, both women rely on the supernatural to transport them beyond their lives. Also, each woman develops a strong bond with another woman, most commonly a grandmother figure. Since neither Tita nor Clara has many options available to them, each character, with the support of a woman mentor, creates her own world in which she can express herself freely. Tita fulfills her dreams of loving Pedro through cooking and by caring for her sister's children. On the other hand, Clara surpasses the reality of her violent husband through episodes of clairvoyance which make her oblivious to both her children's life and her own. The magical realism in *Como agua para chocolate* and the clairvoyance in *La casa de los espíritus*, along with the ghostly presence of the woman mentor in both novels, provide the mechanisms by which Tita and Clara reclaim a sense of their own individuality, free from societal restrictions.

MELANIE KING, '00

Muscarinic M1 Involvement in Working Memory in the Rat

Faculty Sponsor: Jeffrey Wilson

Major: Psychology
Hometown: Waterford, Mich.



Acetylcholine is a major neurotransmitter present throughout the human body. It activates two classes of acetylcholine receptors: the nicotinic and muscarinic receptors. Muscarinic

receptors are widely distributed throughout the central and peripheral nervous systems. The muscarinic receptors exist in at least five genetically distinct forms, where the m1 receptor is enriched in the brain. Agents that target the m1 receptor have the potential of being breakthrough treatments for Alzheimer's disease. It has been shown previously that low doses of scopolamine, a non-selective muscarinic antagonist, disrupt working memory in the rat. Working memory may be defined as the

active system for temporarily storing and manipulating information needed in the execution of complex cognitive tasks. In this experiment, the effects of pirenzepine, an m1 antagonist, have been examined. Nine female Sprague-Dawley rats, using a within subjects design, were injected intraperitoneally with three doses of scopolamine (0, 0.2, and 0.6 mg/kg), methyl-scopolamine (0, 0.2, and 0.6 mg/kg), and pirenzepine (0, 3.3, and 10.0 mg/kg). Pirenzepine has been shown to be less potent than scopolamine. If pirenzepine shows the same effect as scopolamine, then the m1 receptor may be implicated in working memory. If pirenzepine shows no effect, then it may be that the m1 receptor has no involvement in working memory.

ANDREW KOLOZSVARY, '00

Representations of Missionaries

Faculty Sponsor: Mary Collar

Major: English
Hometown: Macomb, Mich.

This thesis is a literary analysis predicated on two assertions: (1) post-colonial representations of missionaries confront questions of imperialism within a unique literary space; (2) representations of missionaries from the subject-position of American writers reveal certain preoccupations, concerns, and even obsessions. These suppositions are brought to bear on two recent works of American literature, *The Color Purple* by Alice Walker and *The Poisonwood Bible* by Barbara Kingsolver. What is discovered is a unifying concern with the imperializing the imagination itself has undergone, an abomination that Walker and Kingsolver attempt to dismantle through an insistence on change, movement, and a self-conscious awareness of the imagination as a substantial social and literary space.

TIA KONZER, '00

The Effects of Social Desirability, Gender, Relation, and Age on Apologies

Faculty Sponsor: William Hayes

Major: Biology
Hometown: Davison, Mich.



Apologies were examined in relation to age and gender of victims, relationship of victim to participant, gender and age of participant, and gender and social desirability rating of partici-

pants. Four different versions of a questionnaire based on Moilanen's (1998) studies were developed, varying in the gender and age of the victim. Also included was the Marlowe-Crowne Social Desirability Scale. One hundred Albion College students and one hundred Albion, Michigan, community members were surveyed, with approximately 25% receiving each form and roughly equal amounts of men and women. A mixed factorial ANOVA was performed and revealed significant results. There was no difference in the degree to which men and women apologized. Social desirability and age of participant had no effect. Men and women apologized most frequently to their friends, followed by strangers, and finally family members. Significant effects were found between the individual situations. No effect was found for the age of the victim. It can be concluded that social desirability has no effect on the results of the questionnaire used; however, there is a large effect on the degree of apology based on situational factors. Gender and type of relationship also play an important role in whether an apology is offered.



KYLE KRAMER, '00

From FDR's New Deal to LBJ's War on Poverty: A Look at Access to Health Care in Twentieth-Century America

Faculty Sponsor: Wesley Dick

Major: American Social History
Hometown: Grand Rapids, Mich.



Discrimination on the basis of race and class in relation to access to health care is both disturbing and widespread. From the Tuskegee experiment to federally-endorsed hospital segrega-

tion, America has a long history of second-rate health care for the nonwhite and poor. Franklin Roosevelt's New Deal and Lyndon Johnson's War on Poverty mark two progressive eras of liberal reform in twentieth-century America. Both eras ushered in social welfare legislation and sweeping social and political changes that included expanded access to health care. Main factors and key players in the struggle for health care include black migration to the North, the white medical community, black physicians, and New Deal and War on Poverty legislation. Both periods of reform had profound effects on access to health care for the nonwhite and poor.

ANNE KRETZMANN, '00

Listening to the Rank and File

Faculty Sponsor: Greg Saltzman

Major: Public Policy
Hometown: River Forest, Ill.



Despite a record-setting economic expansion in the U.S., the poverty rate remains above what it was thirty years ago, and real wages for unskilled workers are often lower than they were in 1973. The

1981 Reagan cuts in federal social programs and the legislation that Clinton signed in 1996 ending welfare as an entitlement exacerbated the problems of the poor.

These economic trends and policy changes arose in part because of the political weakness of the poor. This study describes and analyzes efforts to strengthen the clout of the poor by mobilizing and organizing them.

I present case studies of two current efforts to organize the poor: the Kensington Welfare Rights Union and the Poultry Justice Campaign. While both efforts are affiliated with the labor movement, neither is limited to the traditional role of business unionism. Both Kensington and the Poultry Justice Campaign use modified community organizing techniques that stress the economic human rights of the broader working class and adopt a model of associational or affiliate unionism, rather than focusing exclusively on collective bargaining contracts for current union members. They attempt to strengthen the voice of the rank-and-file worker, rather than that of the union hierarchy.

This thesis also compares these two organizing efforts to historical precedents, such as the IWW, the CIO, the Black Panthers, and the United Farmworkers' organizing campaign of the 1960s and 1970s. The comparison shows the strengths of the rank and file as well as the limits that inclusive mass organizing efforts have.

JENNIFER KUEBLER, '02

(See Mark Ams, '02, and Jennifer Kuebler, '02)

CHAD KURZAWSKI, '00

Sunday Today: A Collection of Poetry and Devotionals

Faculty Sponsor: Lisa Chavez

Majors: English, Speech Communication
Hometown: Taylor, Mich.



In many ways, "Sunday Today" brings literary motion to my personal and ongoing faith journey. Commenting on spirituality and imagination, this collection of poetry and

devotionals dwells on topics such as organized religion, family, prayer, childhood, and the presence of God. Overall, this thesis is a celebration of language, creativity, and literature. The following is a sampling of the short, imagistic poetry found in "Sunday Today."

Daughter Eating Lunch in December

Our poet laureate sips from a bowl of alphabet soup,
creates with swirls and stirs.

Kirk Franklin – Gospel Singer

My smile swings with Jesus as he sways
and bumps with Gospel hips.

marching band

sprinkle-sprandel trombone
in the sprinkle-sprangle rain:
pittery-patterry tempo

**SALLY LANE, '00****Gender and Handwriting**

Faculty Sponsor: William Hayes

Major: Psychology

Hometown: Rochester Hills, Mich.



Even in the twenty-first century—the age of electronic communication—handwriting remains an important part of people's everyday lives. While in the past it was theorized that

things such as personality characteristics or age could be distinguished from a person's handwriting, research has shown that the only trait discernable is the writer's gender. In an attempt to better understand why and under what conditions gender can be identified, a series of experiments was performed. In these studies, subjects were asked to give handwriting samples under a variety of conditions including writing under time constraints, as a person of the opposite sex would, and also as they would normally write. Other subjects were then asked to judge this handwriting according to whether they believed it was a male's or female's handwriting, and also how strongly they felt about their judgment. The data is expected to show that even under these different conditions, gender will still be noticeable. It may then be ascertained that the presence of gender in handwriting is due to both socialization as well as sex differences in motor control.

MICHELLE LESPERANCE, '00**Male House Wrens Respond More Strongly to Song Playbacks of Strangers than of Neighbors during the Nestling Period**

Faculty Sponsor: Dale Kennedy

Majors: Biology, Religious Studies

Hometown: Clinton Township, Mich.



Neighbor/stranger song discrimination has been explored in a variety of song-birds. In 1998 I recorded songs of male House Wrens (*Troglodytes aedon*) at Whitehouse Nature Center and

other sites in Albion, Michigan, and carried out playback experiments to examine whether male wrens differed in responses to songs of neighbors and of strangers. Each experiment was conducted during the nestling period and included songs of a neighbor wren (located in an adjacent territory) and of a stranger (from at least 500m away). Responses to playbacks were scored based on singing behavior and proximity to the song source and a model House Wren, with scores ranging from 0 (no response) to 4 (male attacked the model). House Wrens showed significantly higher responses to songs of strangers than of neighbors during both first and second broods (first brood mean = 2.0 for strangers and 1.1 for neighbors; second brood mean = 2.25 for strangers and 1.375 for neighbors; Wilcoxon matched pairs signed-rank test, $P=0.0113$ for first broods, $P=0.016$ for second broods), as would be expected if strangers pose a greater threat of nest destruction or mate usurpation to a resident male. In 1999, I analyzed songs acoustically and using spectrograms produced by Canary 1.2 Bioacoustics Workstation. Unmated males sang at significantly higher rates than mated males (mean for unmated males=8.9 songs per minute, mean for mated males=3.9 songs per minute; ANOVA, $P<0.0001$), presumably to attract mates, and may provoke stronger playback responses than mated strangers.

DEIRDRE LINDEMANN, '00**Effect of Ethanol on the Photodegradation of CCl_4 in Aqueous Solutions by TiO_2**

Faculty Sponsor: Lisa Lewis

Major: Chemistry

Hometown: St. Joseph, Mich.



The photodecomposition of carbon tetrachloride in aqueous solutions by titanium dioxide was studied using gas chromatography-mass spectrometry with headspace equipment. Previous

work suggested that the addition of an electron donor such as ethanol to aqueous solutions enhanced the reduction rate of CCl_4 . However, we find that with the addition of ethanol at concentrations of 16.7%, 33.3%, and 50.0%, CCl_4 is decomposed but not as effectively as at lower ethanol concentrations of 0%, .033%, 1.00%, and 10.0%. The formation of a byproduct, dioxethane, was observed at the higher concentrations of ethanol, suggesting that there may be a competing reaction that hinders the efficiency of the degradation of the CCl_4 . The kinetics of the degradation of CCl_4 for reactions containing no ethanol or low concentrations of ethanol followed a first-order rate law; however, with the addition of higher concentrations of ethanol, the kinetics of the reaction deviated from first-order behavior.

Co-workers on this project: Theresa Eliason, Elizabeth Carson, Jamie Petrus.



EMILY LINE, '00

Social Environment of a Juvenile Correctional Facility

Faculty Sponsor: Barbara Keyes

Majors: Psychology, Visual Arts
Hometown: Marshall, Mich.



Due to constant changes within juvenile correctional facilities, climate studies are much needed to ensure a high quality of care. A climate study within a juvenile correctional facility

evaluates a myriad of factors: involvement, support, expressiveness, autonomy, practical orientation, personal problem orientation, order and organization, clarity, and staff control. In the current study, all youth residing in a 42-bed juvenile correctional facility completed the Correctional Institutions Environment Scale (C.I.E.S.) on three separate occasions. In addition, the C.I.E.S. responses of current residents were compared to the responses of youth residing in the same facility in 1993. Significant differences were found in the C.I.E.S. scores of these two cohort groups.

REBECCA LITTLE, '00

Re: Imaginings Vision and Cosmology in Gloria Naylor's Texts

Faculty Sponsor: Mary Collar

Major: English
Hometown: Flossmoor, Ill.



Through the progression of the novels *Linden Hills*, *Bailey's Café*, and *Mama Day*, Gloria Naylor re-imagines Christian cosmology and key texts in the Western canon. While her work is a part of the

revisionist feminist project, Naylor recognizes that a genuine re-imagining must actually go beyond revision—beyond only those possibilities opened up within the boundaries still established by the original texts. So Naylor employs dreams and visionary/imaginary spaces to grant her characters both voice and respite from a white patriarchal world. Because these dreamy and visionary spaces are uncharted, they allow Naylor the room to investigate and challenge certain dichotomies: conscious vs. unconscious, spoken vs. unspoken, real vs. fantastic, and secular vs. religious. Naylor wants to explode the definitions deposited by tradition and the canon in order to create other meanings for the written word. As the novels themselves reveal, this agenda has a special significance for black Americans, who have often had nothing but memory and the oral tradition through which to preserve their heritage. But while Naylor is trying to reach and touch the world of the unspoken, she also wants to respect that world by not entirely inscribing and limiting it. Paradoxically, the survival of the spirit and the spiritual depend on their not being written, and Naylor's novels value the spiritual as freedom's unenslaved heart and hope.

BRIAN LONGHEIER, '00

Albion and Corporate America: A Local Industry's Struggle to Survive

Faculty Sponsor: Ian MacInnes

Majors: English, Economics and Management
Hometown: Canton, Ohio



The company now known as Harvard Industries has a rich history in the Albion community. Founded in 1888 as the Albion Malleable Iron Co., its original purpose was to produce parts for farm

implements produced by Gale Manufacturing in Albion. With the advent of the automobile, the company eventually converted its operations primarily to the manufacturing of automobile parts, and the company has been shaped by the automotive industry ever since. In 1967, the company merged with Hayes Industries of Jackson to become one of the primary automotive parts suppliers for the Big Three auto makers in Detroit. This local company would be fully consumed by corporate America in 1987 when it was acquired in a hostile takeover by Harvard Industries—a company known within the industry for poor business decisions. Coupled with the inattention of Harvard's corporate leaders, downturns in the automotive industry caused by the oil crisis of the 1970s and increased foreign competition have threatened the survival of this local industry. Recent years have seen declining morale, caused by declining wages and benefits and staff cuts. Despite such obstacles, though, this company has survived, consistently serving the Albion community as its largest employer and offering a living for many local citizens.



ERIK LOVE, '00
CRAIG OLZAK, '00

Identifying Masculinity in Albion Middle School Boys

Faculty Sponsor: Leonard Berkey

Erik Love, '00
Major: Sociology
Hometown: Southfield, Mich.

Craig Olzak, '00
Major: Political Science
Hometown: Troy, Mich.



Love



Olzak

This project is an outgrowth of a research seminar entitled *The Intersection of Race, Class, and Gender*. In this project, Albion College students took on the dual role of mentor and ethnographic researcher with an Albion Middle School student. Each college student/mentor was paired with an Albion Middle School student "mentee" who was loosely defined by the middle school

as "at-risk." While interacting with their mentees, the college students gathered ethnographic field notes, which they then shared with the entire research team. This collaborative effort resulted in a large pool of ethnographic data that was mined for information about some aspect of the mentees' lives.

This research project focused on the gender construction of middle school boys, which has become a very "hot topic" in contemporary sociology and psychology, particularly in the wake of the perceived increase in school violence. Using R.W. Connell's theory of multiple and interactive masculinities, we have identified a number of distinct masculinities found in Albion Middle School boys. For example, some boys

express a "basketball" masculinity, while others a "music" masculinity. These multiple masculinities are neither separate nor static—they are interactive in a hierarchical fashion. We've studied how these masculinities work with and against one another, and the results of these interactions. In addition, we hope to present a better understanding of these individuals and to offer suggestions to improve the overall lives of Albion Middle School boys.

JENNIFER LUEKEN, '00

Feeding by Female and Male House Wrens at Different Stages during the Breeding Season

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Albion, Mich.



Feeding of nestlings by male House Wrens may differ with breeding pattern. Mated males that attempt or succeed in attracting additional females may feed nestlings less than behavior-

ally monogamous males. In a single-brooded population of House Wrens in Wyoming, investigators found that at nests with very young nestlings (1-3 days old), males fed more than females by passing food into females brooding young nestlings. In 1999, I examined relative rates of feeding by male and female House Wrens in a double-brooded population in southcentral Michigan. Adult wrens were colorbanded to allow for individual identification. I videotaped nest boxes with nestlings for thirty minutes each on nestling days 2-3, 8-9, and 14-16 (for early nests) or 13-15 (for late nests; day 1 is day of hatch). When all videotaped sessions of first broods were included in statistical analysis, females fed nestlings at higher rates than males for all nestling periods. When taped sessions of first broods with no feeding activity were excluded from analysis, males fed at similar rates to females during days 2-3, after which male feeding rates dropped

steadily as female rates more than doubled. Generally, females fed more than males for both first and second broods. Males showed higher feeding rates for second broods than for first broods, which supports the hypothesis that males feed less when attempting to attract additional females.

JESSICA LUEKEN, '00

Singing Rates of Male House Wrens at Different Stages of the Breeding Season in a Double-brooded Population in Michigan

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Albion, Mich.



House Wrens are secondary cavity nesters that breed in Michigan from early May through late August. Changes in singing rates by male House Wrens during the breeding season

have been well-documented in a single-brooded population, but less information is available on singing rates in double-brooded populations, especially for late nests. In 1999, I recorded singing of banded males during the breeding season to examine whether rates of singing differed between: (1) individual males when unmated versus when paired with females; (2) males that were attempting to attract a second female and those mated with a single female during the early part of the breeding season; and (3) individual males at early and late nests in the season. Males sang more when unmated, but there were no significant differences between singing rates of males attempting to attract a second female or between singing rates at early and late nests.



MICHAEL MARA, '00

The Future of Affirmative Action

Faculty Sponsor: Kathy Purnell

Major: Political Science
Hometown: Naperville, Ill.



My thesis examines the state of public opinion on affirmative action and outlines a plan for the future of the program. The goal of my research was threefold: (1) to identify public opinion through an

informal survey that I conducted in Chicago and to look at national survey data to compare public ideas with those of affirmative action scholars and Supreme Court decisions; (2) to identify reasonable objections to current affirmative action programs and examine options for reform; and (3) to create my own plan for the reform of affirmative action. My research encompassed an examination of various written sources including scholars and Supreme Court decisions, as well as national survey data. I also conducted 117 face-to-face interviews for an informal survey.

Through the course of my thesis I have drawn several major conclusions. First, the definition of affirmative action is elusive. People have different definitions for affirmative action, and people of all different races, genders, and any other identifiable traits, have different opinions on the subject. It is not possible to predict how someone will feel about affirmative action simply by looking at his or her traits or socially constructed identity. Second, Supreme Court jurisprudence has not fostered our collective understanding of affirmative action. Court decisions (whether at the federal or state level) have at times been contradictory and confusing on this subject. Therefore, it is not possible to look to the courts in order to better understand affirmative action. Third, there are several reasonable and justifiable objections to current affirmative action programs that need to be considered when thinking about reform. Examples of these objections include that affirmative action is

an exclusionary program and that affirmative action undermines the qualifications of all minorities. Fourth, class-based affirmative action, while it may sound promising, is not a reasonable solution for reform.

Finally, and most importantly, I have developed a plan for the future of affirmative action. My plan involves the elimination of identity categories and makes affirmative action a program that can benefit any person, regardless of their race or gender, provided they have suffered from discrimination. Furthermore, I systematically address each of the objections that have been raised earlier in my thesis and show how my plan either eliminates or mitigates these problems. My presentation at this symposium will focus on elaborating the details of my plan for the reform of affirmative action.

ERIN MARASCO, '00

Using PCR-RFLP of Major Histocompatibility Class II Genes for Genetic Analysis of Nurse Shark Populations

Faculty Sponsor: Kenneth Saville

Major: Biology
Hometown: Albion, Mich.



There have been few population genetic studies on sharks in general, and none on the nurse shark. Studies that have been done have relied on three types of molecular polymorphisms:

allozymes, mitochondrial DNA, or microsatellites. We are attempting to study population genetics of the nurse shark using a fourth approach, PCR-RFLP (polymerase chain reaction followed by restriction fragment length polymorphism analysis), a procedure we have also used for paternity tests in this species. This method detects distinct allelic differences at a major histocompatibility class II (MHC II) locus, allowing alleles to be first grouped into two types, A and B, and then subsequently identified as unique alleles. Here we are using

a similar technique to determine MHC II allele frequencies within a nurse shark population. To do this, tissue samples were taken from nurse sharks captured by Jeffrey Carrier (Albion College) in the Florida Keys. PCR was used to amplify the relevant MHC II locus, yielding successful PCR products from 18 of 29 samples. Initial restriction digests have shown that nine samples have both A and B alleles, and nine samples have only type A alleles. Further RFLP analysis will allow us to identify specific genotypes for each shark, and thus to calculate allele frequencies, thereby enabling us to gain a better understanding of the genetic structure of this nurse shark population.

ELEONORA MARIES, '00

The Development of a Method for Paternity Testing in the Nurse Shark Using PCR-RFLP and Comparative DNA Sequence Analyses of Major Histocompatibility Class II Alpha Genes

Faculty Sponsor: Kenneth Saville

Major: Biology
Hometown: Bucharest, Romania



We have developed a DNA-based paternity test with which to further our understanding of the mating behavior and reproductive biology of the nurse shark. It is hoped that this

paternity test will allow us to determine if matings of female nurse sharks with multiple males can lead to multiple paternity in a single brood of offspring. We have focused our analysis on the major histocompatibility class II A (MHC II A) locus. Others have shown that this locus is duplicated, and that each of the duplicated loci is highly polymorphic (Kashara et al., 1992, Eur. J. Immunol. 23:2160-2165). We have used a PCR-RFLP strategy to determine the MHC class II A genotypes of DNA amplified from frozen shark tissue of one small family consisting of



one mother and seven offspring. We were able to assign genotypes to each member of the first family. The analysis of both families showed clear evidence of multiple paternity.

ELEONORA MARIES, '00

Women's Access to Health Insurance

Faculty Sponsor: Susan Klarr

Major: Biology
Hometown: Bucharest, Romania

This project is attempting to sketch a picture of women's health care in the United States as I saw it in the city of Chicago. The project is composed of background research information on women's access to health insurance in the United States, of seven life stories of women whom I have interviewed, of a description of the free clinic of the Chicago Health Outreach which serves mainly homeless and disenfranchised individuals, and of materials documenting the rally for universal health care which took place in Chicago's Federal Plaza on Nov. 9, 1999.

The state of health care in the U.S. is a burning topic at the moment, present in the news almost on a daily basis. The background information is a health policy paper that was written for Health and Medicine Policy Research Group, a nonprofit organization in the city of Chicago. The study includes current data and graphs. This work was presented by Margie Schaps, executive director of health and medicine, at the APHA conference on Nov. 8, 1999 in Chicago as an attempt to make more people aware of the high rate of uninsurance in this country, of the difficulties that women encounter in obtaining needed health care, and of the problems that exist in the U.S. health care system. The rally for universal health care was organized by numerous activist groups from the city in order to fight for a single payer, national health system, seen by the authors of the health policy paper as the only solution to all these concerns.

KAMI MARSACK, '02

(See Elizabeth Duvall, '03, and Kami Marsack, '02)

KRISTIN McCAULEY, '00

"Hispanic" Identity

Faculty Sponsor: Leonard Berkey

Major: Sociology
Hometown: Burnsville, Minn.



As of the 1990 U.S. Census, the "Hispanic" population of Albion was 5.1% of the whole. The place of this small minority, who in this community overwhelmingly refer to themselves

as Mexican Americans, is frequently overlooked in racial and ethnic discussions of the city. My project is intended as an initial understanding of how individuals learn to create and perform a Hispanic identity.

As my Honors Thesis, this project has been developed in a seminar class entitled The Intersection of Race, Class, and Gender. The course paired Albion College students with Albion Middle School students in a mentoring relationship. Through interaction with the "mentees," ethnographic field notes were taken and posted to be accessible for all class members. From this body of notes I was able to examine the racial comments that have been made and the specific comments about and from the Mexican American students. From these comments and various interviews, I was able to identify ways family, peer, and school are areas that influence racial performance.

Although middle school is a difficult time for many students, the crisis is especially severe for girls with a Hispanic background. Several sources cite that these girls leave school at a greater rate than any other group, male or female. Although my research is contributing to the larger body of social psychological literature, it is my hope

that, through new insights, schools and programs would be more responsive to the needs presented in this work.

SEAN McCUDDY, '00

Petrographic and Geochemical Analysis of Volcanic Rocks from Mount Takahe, West Antarctica: Implications for Higher Paleo-ice Levels and Global Sea-level Change

Faculty Sponsor: Thomas Wilch

Major: Geology
Hometown: Elkhart, Ind.



Because the West Antarctic ice sheet (WAIS) is grounded mostly below sea level, it is considered to be inherently unstable. If the WAIS were to melt completely, sea level would rise 6m and flood coastal

cities around the world. Scientists are interested in understanding the relationship between the size of the ice sheet and global climate change. Field studies at Mount Takahe volcano in West Antarctica, combined with laboratory analysis of collected rock samples, indicate that ice levels were 413 m higher during the last ice age. Radiometric age-dating of samples by the ⁴⁰Ar/³⁹Ar method demonstrates that the ice sheet highstand occurred 21,900-1,800 years ago. Thin sections from rock samples collected at Mount Takahe are being characterized in order to distinguish rocks that were erupted beneath the ice sheet from those erupted above the level of the ice sheet. Differences in porosity, vesicularity, and clast angularity will be quantified and measured statistically. Preliminary data indicate that the textures and clast morphologies observed in thin section will be useful in differentiating subaerial and subglacial depositional environments. In addition, whole-rock geochemistry, based on XRF analysis, will be used to correlate different lava flows and eruption events on the volcano. The combined field and laboratory results will provide detailed proxy records of former ice



levels that can be used to evaluate the relationships among the ice sheet, sea level, and global climate change.

ELIZABETH METTLER, '03

A Kinematic Analysis and Electromyographic Study of the Infraspinatus in the Float Serve in Volleyball: A Case Study

Faculty Sponsor: Darrell Sedersten

Major: Undeclared
Hometown: Sturgis, Mich.



Many higher-level volleyball players have infraspinatus atrophy (sometimes with associated pain) as a result of suprascapular nerve impingement caused by the overhead swing mechanics involved

in volleyball. The swing mechanics used in the execution of the float serve have been identified as the possible mechanism for this impingement. The goal of the case study was to identify a relationship between muscular activity of the infraspinatus muscle and the overhead mechanics of the float serve in volleyball. A float serve consists of an overhead serve that does not have a follow-through phase. The rotator cuff muscles are used to break the forward rotation of the humerus. Using the angular relationship between the humerus and scapular spine, the scapular spine and the vertebral column, and the vertebral column and the horizontal plane, and the EMG results, different arm angles in the float serve mechanism produce varying EMG results. This phenomenon causes decreased activity in the infraspinatus. The results of this study indicate that varying positions of the humeral/scapular angles may reduce the impingement of the supra-scapular nerve.

JANNA MUCCIO, '00

An Attempt to Isolate the Male Mating Pheromone of *Agelenopsis aperta*

Faculty Sponsors: Gwen Pearson, Andrew French

Major: Biology
Hometown: Big Rapids, Mich.



The subject of my research was a funnel web spider, species *Agelenopsis aperta*. This spider lives in the arid portions of the southwestern United States, and builds a characteristic "funnel web"

on the ground. The courting rituals of the spider are elaborate, with male displays of abdomen wagging and pushups on the web. During mating, the female spider is rendered unconscious in the presence of the male, with no physical contact between the two spiders. This suggests the presence of a chemical emitted by the male to allow mating to occur.

In an attempt to isolate this possible pheromone, a mating chamber with a specialized filter to capture the pheromone was constructed. Homogenates of both male and female spiders were also analyzed using a gas chromatograph and mass spectrometer. Based on the results of these experiments, several chemical compounds were tested in the presence of the spiders to test if they were rendered unconscious. The compounds identified were 2-ethyl-1-hexanol, 2-methylbuteraldehyde, and isovaleraldehyde.

The isolation of this pheromone would be useful in a further understanding of biological and behavioral relationships between these spiders. Many pheromone isolations have been successful in insects, but few spiders have been the subjects of said experiments. The existence and isolation of a male mating pheromone in *Agelenopsis aperta* could lead to the isolation of compounds with similar roles in other species of spiders.

EMILY MULL, '00

The Effect of Victim Age and Relationship to Assailant on Attribution of Blame in Rape Cases

Faculty Sponsor: Amy Otto

Majors: Psychology, Visual Arts
Hometown: Ann Arbor, Mich.



The purpose of this study is to investigate the impact of the victim's age and her relationship to the attacker on levels and attribution of blame in rape cases. The type of rape being considered

was male against female, and the results should not be expected to apply to other situations of rape. Participants in this study are 100 adults ranging in age from 18 to 60, from southern Michigan. The design of the study is two (age of victim) by two (relationship to attacker) factorial. Subjects were randomly assigned to read one of four artificial newspaper article descriptions of a victim of a sexual assault. They then listened to a tape of a simulated call to an Emergency Medical Services (EMS) worker by the victim. After listening to the tape, attribution of blame was measured with a questionnaire. Included in the questionnaire is Burt's Rape Myth Acceptance Scale that examined participant's subscription to various stereotypes about rape. It is hypothesized that subjects will blame younger victims more than older victims and blame victims who had a previous relationship with their attacker. Recognizing the effect of victim age on attribution of blame will raise awareness about age-biases in rape cases.

CRAIG OLZAK, '00

(See Erik Love, '00, and Craig Olzak, '00)



CHRISTOPHER PETERSON, '00

Constructing Masculinity

Faculty Sponsor: Leonard Berkey

Major: Sociology
Hometown: East Lansing, Mich.



What are the socio-developmental ramifications of growing up white, poor, and male in the city of Albion, Michigan? This is the central question in the paper "Constructing Masculinities."

The paper revolves around the life of a child whom I am mentoring named John and the experiences he has had that have led him to be the person he is today and who he will be in the future. I endeavor to discover what effects peers, family, and education may have in developing his sense of self as well as his view of the world. Ultimately, I will tie together these themes of race, class, gender, and identity to describe how John's masculinity has been constructed as a result of his life in Albion.

MELISSA PETERSON, '00

O Let Me Be the Voice: An Analysis of Women's Roles in the Holocaust

Faculty Sponsor: Geoffrey Cocks

Majors: Anthropology and Sociology,
Women's Studies
Hometown: Lowell, Mich.



The purpose of my research is to compile data on the experiences of women in Germany during the Holocaust. Some women were perpetrators; they served as camp guards, and some

were members of the Nazi party. Others, known as bystanders, stood silently by and watched as Hitler's victims were sent off to their deaths or would listen to their husbands' reports on the killing and do nothing. The final group of women consists of those who were sent off to their deaths at the hands of others; some survived but all were victims. No single source currently published contains information on women in all of these categories, making my work the most comprehensive to date. Additionally, I examined the idea that these categories sometimes overlap. I found that it was possible for a woman to be both a victim and a perpetrator, to be a bystander and a victim.

NATHAN PIWOWARSKI, '02

(See Misty Hensley, '02, and Nathan Piwowski, '02)

PHILLIP REED, '01

The Military, Religious, Political, and Economic Reforms of Diocletian: Proto-Socialism and Feudalism in the "New Roman Empire"

Faculty Sponsor: James Cook

Major: Political Science
Hometown: Mattawan, Mich.



Understanding certain political activities of an ancient Roman emperor can help one predict some probable outcomes of similar programs in American politics today. One of the most

successful of the later Roman emperors, Diocletian (284 A.D.-305 A.D.), put in place sweeping reforms that restructured the government, lessened the intense suffering of the populace, and, at least for a while, arrested the internal disintegration of the great Roman Empire. Diocletian's political reforms restored order to a largely uncontrolled military leadership and disciplined corrupt and unruly civil magistrates. His initiatives also shored up the empire's increasingly shaky economic foundations. Diocletian used tactics, in fact, that Karl Marx would have deemed socialist to create a new state and a new, orderly governing hierarchy. Though often implemented in brutal and repressive ways, the emperor's policies performed a meritorious public service in a time of struggle. Diocletian's reforms have influenced political structuring directly and indirectly through the subsequent years. His reconfiguration of the Roman Empire helped to institutionalize the feudal system that persisted in Europe almost until the end of the Middle Ages, and it put into practice a kind of proto-socialism that we recognize as analogous to political experiments of the twentieth century.

The system that Diocletian established assumed total state authority supported by a centralized bureaucratic state with final power resting in the hands of the emperor.



This unifocal power structure provided Diocletian with the ability to establish a socialized system whose sole theoretical focus was serving the common good. Everyone, again in theory, became a functioning instrument of the state. A kind of socialism was the desired goal with all citizens equal in the eyes of the law, and all working together for the success of the state. Diocletian's reforms anticipated many current political theories in the Western world, and his initiatives demonstrated both advantages and disadvantages for the citizens and institutions of a socialized totalitarian state.

AMY REIMANN, '00

Dominick Labino: A Study of Development

Faculty Sponsor: Bille Wickre

Major: Art History
Hometown: Albion, Mich.



Dominick Labino, chemist, inventor, and glassblower from Grand Rapids, Ohio, was instrumental in founding the Studio Glass Movement. In 1962, two workshops were held at the Toledo Museum of

Art that introduced new equipment and materials to artists wanting to blow glass in a small-studio setting. Brought in to assist with technical matters, Labino designed a new furnace and brought glass marbles suitable for melting at lower temperatures. Without Labino's technical assistance these workshops would have failed, and glass production of all types would have continued mainly in factory settings. Because of Labino's innovations in these pioneering glass workshops, artists now have the ability to work safely and with glass formulas that are suitable for smaller furnaces.

Shortly after these workshops Labino retired from his position as vice-president of research and development at Johns-Manville Corp., and worked in his self-designed and built glass studio. With this studio he began

to develop glass formulas and equipment for glass melting and blowing, as well as his own individual style that is recognized in many museum collections nationwide. This presentation will look specifically at some of Labino's works existing in the Albion College fine art collection, and will discuss their importance in Labino's early development of color, style, and form. In addition, all of Albion College's Labino pieces will be on display in the Bobbitt Visual Arts Building lobby during the 2000 Elkin Isaac Research Symposium.

SARAH ROSIN, '00

Identifying Risk Factors for Eating Disorders

Faculty Sponsor: Barbara Keyes

Major: Psychology
Hometown: Frankenmuth, Mich.



The purpose of Study I was to identify risk factors contributing to the development of eating disorders. Seventy women ($m = 33.3$ years) in recovery completed a questionnaire exploring factors in

their childhood and adolescence that predisposed them to develop an eating disorder. Several environmental risk factors and personality characteristics were identified. The purpose of Study II was to investigate the developmental implications of factors placing individuals at risk for eating disorders. Interviews and questionnaires concerning environmental and sociocultural factors were administered to 149 males and females (children in grades 2, 4, 6, 8 from a middle-class school district; college students from a Midwestern liberal arts college). Participants also completed the Body-Esteem Scale (BES; Mendelson & White, 1982), and their Body Mass Indexes (BMI's) were calculated. Significant gender and developmental differences were found in BES scores, and factors which predicted BES scores were identified. Participants' BMI's did not predict their BES scores.

MICHELLE SAUTTER, '00

Heavy Metal Accumulation in Staghorn Sumac (*Rhus hirta* [= *typhina*]) in the Albion Area

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Olivet, Mich.



Heavy metal pollution is of great concern in industrial areas. Reports from the Environmental Protection Agency indicate that industries in Albion release airborne particulate

matter that contains heavy metals, but show no evidence that industries exceed allowed release levels. Organisms in ecological systems may accumulate heavy metals, and biological amplification of these compounds could lead to levels that are toxic. Previous research has shown that *Rhus hirta* (staghorn sumac) can accumulate heavy metals in leaves. However, it is not known whether similar accumulation occurs in the fruit of this plant. *Rhus hirta* produces pubescent (hairy) fruits that persist through winter and are high in vitamins. Birds seek these fruits during the early spring months when other food is scarce. If the fruits contain heavy metals, birds that feed on them may accumulate these compounds in their bodies. Analysis of soil samples from my six study sites throughout Albion has shown slightly elevated levels of chromium, copper, nickel, lead, zinc, magnesium oxide, and manganese. Samples of leaves and fruits from the same sites were taken both in early spring (fruit of the previous season) and late fall (fruit of current season). It is expected that analysis of leaves will show an increase in levels of heavy metals from spring to fall, with the largest accumulations anticipated in samples from sites nearest industrial areas. The fruits may show fairly consistent accumulation levels, as both spring and fall samples contain mature fruit.



HEATHER SCHMIDT, '01

Research Genesis: A Comparative Approach to the Fall of Man

Faculty Sponsor: Frank Frick

Majors: Biology, Religious Studies
Hometown: Davisburg, Mich.



Look at me. I did it. I took that step. I walked up to that tree, glimmering with morning dew. I gazed at the ripe, fresh orb. I took a bite. The juice dribbled over my skin; the world grew brighter and a

breeze tousled my hair. I wondered where the wind went when it blew away. Perhaps it stopped at the edge of the Garden. Was there an edge to the garden? An end to it? What was beyond the Garden? Funny, I never questioned that before. . .

If it is true that religion exists to answer questions of meaning, it can be asserted that one of the essential inquiries rests in man's cry of "Who am I?" For cultures of biblical derivation, no text serves as a better mirror, illuminating man's sense of himself and his relationship to the world, than Genesis 3. In fact, it is in the womb of this scriptural passage, that Islamic/Judeo/Christian cultures find the birth of humanity, mortality, and the nature of man. With the reach for the fruit of Knowledge, there is a third creation (beyond that of universe and body), a catalyst that has as its products sexuality, pride, temptation, will, good, and evil. In this single act, Man finds himself at odds with God. It is in these folds that one can find the thread of social struggle between Fruit and Faith, and the attempt of an extended culture to characterize Reason as it can be applied to the human-divinity dichotomy.

CAROLINE SCOTT, '00

The Development of Representational Mathematics in Early Childhood

Faculty Sponsor: Reuben Rubio

Major: Mathematics, Elementary Education Certification
Hometown: Midland, Mich.



In this study, I examined how young children develop a variety of mathematical ideas. The study focused on children ranging from four to nine years of age. All participants were enrolled in local

preschool, first-, and third-grade classes, and children were selected for this study on a strictly voluntary basis. Each child was given a battery of tests designed to test a variety of mathematical and cognitive skills. Tested skills focused on a number of key areas: counting abilities and strategies, logical classification, cardinality, spatial reasoning, mental arithmetic, estimation, and conservation. The results of this study illustrate how children at various cognitive stages apply dramatically different strategies and cognitive abilities to mathematical problem-solving.

KELLY SEAR, '01

The Role of Sexual Assault Nurse Examiners in Sexual Assault Treatment and Prosecution

Faculty Sponsor: Patricia Franzen

Majors: Anthropology and Sociology, Women's Studies
Hometown: Mount Clemens, Mich.



Sexual assault occurs every minute of every day. Since the 1970s, when rape crisis centers first opened, people have been trying to find a positive way to help survivors of assault. My

research has shown that the Sexual Assault Nurse Examiner (SANE) program is the next logical step in combating sexual assault. This program, which takes the survivors out of the emergency room, helps by putting them into the care of forensically-trained nurses. This removal many times makes the survivor feel more at ease and also helps to collect more evidence for prosecuting the criminals. This is a positive program for all parties who are involved when a crime takes place. The problem, however, is that this is not a nationwide program; there are only seven programs in Michigan. This is mainly because funding has to come from grants and private donations.

My methods have included interviewing people associated with SANE and also researching by way of books and the Internet. Information on this subject is not that easy to come by, and that is one reason why this thesis was written. Making information about SANE more accessible will help to show how important this program is to the future of the fight against sexual assault.



AMY SHEELE, '00

The Importance of Women's Literacy

Faculty Sponsor: Patricia Franzen

Major: Speech Communication
Hometown: St. Clair, Mich.



Women's literacy rates lag behind men's worldwide. Scholars and policymakers realize that women's illiteracy hinders not only a woman's status and opportunities, but it also affects her

family and community. Illiteracy is often a cycle that is passed down from generation to generation. Family literacy is being promoted worldwide in an effort to reduce illiteracy rates. I will examine the benefits of family literacy programs and the elements that make for a successful program. I will assess the extent to which women's literacy acts as a catalyst for the development of countries and the alleviation of many problems, such as sickness, disease, poverty, malnutrition, and infant mortality. I will assess this by using three countries as case studies: the United States, Cuba, and India. I have chosen these three countries because of their different economies and approaches to literacy.

JAMES SMABY, '00

Computational Study of the Reactive Potential Surface of Carbon Dioxide Dimer

Faculty Sponsor: Craig Bieler

Majors: Chemistry, Mathematics
Hometown: Marquette, Mich.



The potential energy surface for the reaction of two carbon dioxide molecules was explored using the Gaussian 98W quantum mechanical package. Several minima were observed at the

MP2 level and for a variety of basis sets. These included the slipped parallel van der Waals dimer, 1,2-dioxetane-3,4-dione (1), and 1,3-dioxetane-2,4-dione. The path between the dimer and 1 was explored using these computational methods to help understand the energetics and mechanism of the reaction. The observance of 1 is important because it has never been isolated, even though it has been implicated as an intermediate of the chemiluminescent reaction in 'light sticks'. It is hoped that, with this information, 1 can be created in a low energy, inert environment such as that provided by large helium clusters.

BENJAMIN SMITH, '00

Vascular Flora and Plant Communities in the Vicinity of the Doty Wildflower Trail, Baker Sanctuary, Calhoun County, Michigan

Faculty Sponsor: Dan Skean

Major: Biology
Hometown: Junction City, Wisc.



Bernard W. Baker Sanctuary is a 391-hectare nature preserve in portions of Sec 10, 11, 14, 15, and 16, T1S, and R5 and 6W, which was established in 1941 as the first sanctuary of the

Michigan Audubon Society. The Iva E. Doty Wildflower Trail was established in Sec 11 of the sanctuary with an endowment given by Miss Doty shortly before her death in 1964. A floristic study was conducted in a ca. 850 x 400 m (34 ha) area surrounding the trail from May 1998-October 1999. A vegetation map of the trail area was produced using ArcView v. 3.0 from aerial photography, satellite imagery, and GPS data. Major natural community types present are Southern Wet Meadow, Mesic Southern Forest, Southern Swamp, and Southern Shrub-Carr. A total of ca. 260 species in 62 families was collected and vouchered by herbarium specimens deposited at ALBC. *Cypripedium candidum* Willd., *Filipendula rubra* (Hill) Robinson, and *Hydrastis canadensis* L., are state-listed threatened species present in the area.



SCOTT SMITH, '00

An Evaluation of the Acid Rain Program

Faculty Sponsor: Daniel Christiansen

Major: Economics and Management
Hometown: Romulus, Mich.



The Clean Air Act Amendments of 1990 created a tradable allowance program, called the Acid Rain Program, to reduce sulfur dioxide emissions from fossil fuel-burning power plants in the

United States. My research focused on the economic aspects of the Acid Rain Program, particularly the benefits to using a market-based program (in which markets rather than governments determine the emissions of firms) of tradable emissions allowances instead of the traditional command-and-control programs that establish blanket standards for all firms. Market-based programs are designed to achieve the same results as command-and-control programs but at lower costs. The research also reviewed the formulation of the program, evaluating it in terms of reducing both sulfur dioxide emissions and acid deposition while creating a viable allowance market. The results show that the program has successfully reduced both emissions and deposition while creating a relatively efficient private market. Finally, I examined the price structure of the allowances over time by looking at past research and updating it with more current information. I found that the market continues to operate as one would generally predict despite the increased uncertainty of the recent past and the lead-up to Phase II of the program in 2000.

CHANDRA THOMAS, '01

Tracing History: Journey of the Drums, African Dance, and Its Influence on More Contemporary Forms of Dance

Faculty Sponsor: Melissa Wyss

Major: Psychology
Hometown: Pontiac, Mich.



For African cultures dance is a part of life. It serves a daily purpose. Each movement tells a story, or has a meaning. African dance has energy, polyrhythms, improvisations, and is a demonstration

of culture and history. Likewise, dance in the United States is a display of history and culture, from the Charleston to breakdancing and to the tootsie roll. We can tell how old we were and where we were by just thinking back to the dances that have moved through our lives.

In the summer of 1998, Melissa Wyss and I were awarded a grant to work with Robin Wilson, dance professor at the University of Michigan, to do research on and understand African dance's influence on contemporary forms of dance, such as jazz and tap. This research was a basis for a section in a newly developed class, the Art of Dance. In this class, the style of movement and certain dances from the 1960s, tap, jazz, and hip-hop, were traced back to African culture and dance traditions.

To further demonstrate how many popular dance forms in the U.S. have evolved from African dance, a dance (to be performed in the Spring Dance Concert) is being choreographed to illustrate a story or time line of dances from the 1800s to present. Also, the story of the drums and their importance in African dance and African culture will be presented throughout the piece. This dance will concentrate on demonstrating how African American dance forms have their roots in African dance. This project is just a beginning of an in-depth and worthwhile story told in movement.

AMY WASIAK, '00

The Long-Term Effect of Bereavement on Health

Faculty Sponsor: Barbara Keyes

Major: Psychology
Hometown: Fenton, Mich.



Stress has been shown to be devastating to both the mental and physical aspects of a person's life. One long-term source of stress that will eventually affect every human is bereavement. Death

of a loved one can alter a person's life dramatically. While most of the previous research has dealt with the death of spouses or children, very little has been done to examine the effects of the loss of parents, siblings, or a close friend. The previous research has, however, demonstrated a distinction between actions of bereavement and the relationship of the deceased to the survivor. Due to previous research, it has been hypothesized that those dealing with the loss of a spouse or a child would demonstrate more physical and mental symptoms than those dealing with the death of a parent would. It was also hypothesized that participants dealing with the death of multiple people would demonstrate more physical and mental symptoms. One hundred and fifty-three participants from a bereavement group based in Kalamazoo were surveyed. Participants filled out three questionnaires: the Brief Symptom Inventory, a physical symptom checklist, and a demographic questionnaire. The results are still pending, but at this time, it appears that the results follow the general outline of the hypotheses.



BRITT WEGENER, '00

The Biracial Self

Faculty Sponsor: Leonard Berkey

Major: Sociology
Hometown: Battle Creek, Mich.



The search for self-identity is difficult for all adolescent young adults; however, research suggests that this search has been far more complex and trying for African-Americans—more so than nearly any

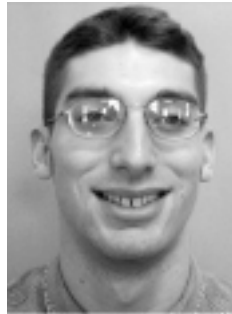
group in American society. With this in mind, it is mind-boggling to imagine the struggle endured by children with one parent who is African-American and the other who is white. Many of these children (the product of interracial marriage) choose to racially identify themselves as black, others take on a white identity, and still others choose to consider themselves biracial. Many factors are taken into consideration when a biracial individual chooses to identify with one specific ethnic group or, in this case, two groups simultaneously. These factors will, of course, be examined and re-examined through my research method of face-to-face interviews and throughout the course of this paper and literature review, and will be the main focus in my research as they are pertinent in determining and coming to terms with racial- and self-identity as well as the understanding of the notion of the biracial self.

NICHOLAS WHITNEY, '00

Applications of Ultrasonic Telemetry to the Study of Nurse Shark (*Ginglymostoma cirratum*) Reproductive Behavior

Faculty Sponsor: Jeffrey Carrier

Major: Biology
Hometown: Jackson, Mich.



Ultrasonic telemetry is being increasingly used to study movement patterns and other phenomena in free-living aquatic animals. Data regarding short- and long-range movements of

elasmobranchs are critical for proper management initiatives because of the high susceptibility of sharks to commercial fisheries. Another impediment to management is the dearth of knowledge regarding shark reproduction and reproductive behaviors. The present study employed ultrasonic telemetry to track the short-range movements of nurse sharks (*Ginglymostoma cirratum*) in the Florida Keys. Nurse sharks are a coastal species that show an extremely high level of site fidelity and whose mating has been systematically examined in the current study area. The goals of the telemetry studies were to determine the movement range of animals during the mating season and to confirm the hypothesis that the study population is reproductively isolated. Tracking methods and strategies are discussed.



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 became athletic director at University of the Pacific and 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 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.

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