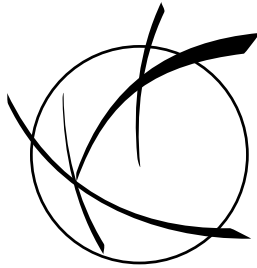


ELKIN R. ISAAC

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THE TENTH ANNUAL ELKIN R. ISAAC STUDENT RESEARCH SYMPOSIUM

ALBION COLLEGE
APRIL 14-15, 1999

Schedule of Events

Wednesday, April 14, 1999

7:30 p.m. The Elkin R. Isaac Lecture: Emilio DeGrazia, '63
Welcome: President Peter T. Mitchell, '67
Opening Remarks: Thomas G. Schwaderer, M.D., '56
Elkin R. Isaac, '48

Speaker Introduction: Hal H. Wyss, Professor of English
Bobbitt Visual Arts Center Auditorium

Thursday, April 15, 1999

9:00-11:00 a.m. Student Research Symposium Platform Presentations
Refreshments served at each location listed below, 8:30 a.m.
See also detailed schedule of presentations on pages 4-5.

Social Sciences Forum
Olin 112

Humanities and Fine Arts Forum
Bobbitt Visual Arts Auditorium

Natural Sciences and Mathematics Forum
Norris 103

11:00 a.m.-Noon Albion College Convocation Lecture Series: Wade Davis
Introduction: Jeffrey C. Carrier, Vice President for Academic Affairs
Norris 101

1:00-1:45 p.m. Student Research Symposium Poster Presentations
Gerstacker Commons, Kellogg Center

1:00-1:45 p.m. Book-signing: Wade Davis
Gerstacker Commons, Kellogg Center

2:00-4:00 p.m. Student Research Symposium Platform Presentations
See locations listed for 9:00 a.m. sessions.

4:15 p.m. Sigma Xi Lecture: Laurie Godfrey
Introduction: Elizabeth M. Brumfiel, Ludington Trustees' Professor (Anthropology)
Bobbitt Visual Arts Center Auditorium



The 1999 Elkin R. Isaac Lecture

EMILIO DEGRAZIA

Emilio DeGrazia, '63, holds master's and doctoral degrees in English from Ohio State University. He has lived in Minnesota since 1969, and is currently professor of English at Winona State University.



DeGrazia says he began his career as an author "in the middle of [one] night in 1973." That night produced a first draft of "The Enemy," one of the stories included in *Enemy Country*, DeGrazia's first published book. *Enemy Country* was selected by Anne Tyler for a Writer's Choice Award and chosen as one of *Library Journal's* "Best Small Press Books of 1984"; another collection of stories, *Seventeen Grams of Soul*, won a Minnesota Book Award. DeGrazia has also published more than 100 works of fiction, poetry, and essays in various anthologies and literary journals. He is the author of two published novels, *Billy Brazil* and *A Canticle for Bread and Stones*, has co-edited the anthology *26 Minnesota Writers*, and is the founder of the literary journal *Great River Review*. A third short story collection, *Born-Again Blues*, is awaiting publication.

Of his craft, DeGrazia says: "I'm driven by fairly old-fashioned ideas about the writing life: That one becomes a writer by discovering that one has something to 'say'—that the result should be at once story, sermon, and song; that one should genuinely want to communicate, present a vision capable of evoking a passionate response; . . . and that good art has only one legitimate *raison d'être*, the clarification of life for the purpose of enhancing it."

Convocation Lecture Series

WADE DAVIS

Wade Davis is an ethnobotanist and photographer whose research has spanned cultures and environments around the globe. Working for the Harvard Botanical Museum, Davis lived with tribal groups in eight Latin American nations while making some 6,000 botanical collections. His work in Haiti, investigating folk preparations implicated in the creation of zombies, inspired him to write two books, *Passage of Darkness* and *The Serpent and the Rainbow*. The latter was an international bestseller which later became a major motion picture. Davis has also produced books and television documentaries on his travels and research in Borneo, Papua New Guinea and Native American tribes in Canada and the United States.



Davis' other books include *Nomads of the Dawn*, *Shadows in the Sun*, and *Penan: Voice for the Borneo Rain Forest*, which is being adapted by Warner Bros. for feature film release. He has published more than 50 scientific articles and has written for such publications as *Newsweek*, *Premiere*, *Outside*, *Omni* and *Harper's*. Davis' documentaries for television include the Discovery Channel's 13-part series, "Earthguide."

In addition to continuing his ethnobotanical research, Davis lectures widely. He has addressed the American Museum of Natural History, the Smithsonian Institution, the National Geographic Society and the Royal Ontario and British Columbia Museums, along with many other national scientific organizations and more than 50 universities.

Davis holds degrees in anthropology and biology, and received a doctorate in ethnobotany from Harvard University.

The 1999 Sigma Xi Lecture

LAURIE GODFREY

Laurie Godfrey has done extensive paleontological fieldwork on the giant extinct lemurs of Madagascar and their associated fauna. Her research focuses on the anatomy and evolution of primates, and currently includes heterochrony—the evolution of ontogeny. She has received research grants from the National Science Foundation, the National Geographic Society and other organizations.



Currently a professor of anthropology at the University of Massachusetts, Amherst, Godfrey has also held the position of Science Scholar at Radcliffe College's Bunting Institute and was a National Science Foundation-sponsored Visiting Professor for Women in Science in the Department of Anatomical Sciences at the State University of New York, Stony Brook, in 1994-95. She was honored with a Distinguished Teacher Award at University of Massachusetts in 1997-98.

A member of Phi Beta Kappa and Sigma Xi, she holds a Ph.D. in biological anthropology from Harvard University. She is the author of two books, *What Darwin Began: Modern Darwinian and Non-Darwinian Perspectives on Evolution* and *Scientists Confront Creationism*, as well as numerous journal articles. Her community work on the public understanding of evolutionary biology earned her an award from the American Humanist Association.



Schedule of Presentations—Thursday, April 15, 1999

SOCIAL SCIENCES FORUM—Olin 112

9:00	Corinne Johnson (Grossman)	Putting <i>The Clash</i> into Context: The Significance of Huntington's Thesis
9:15	Anne-Marie Badenhorst, Sheila Johnson, and Lisa Leitz (Berkey/Keyes)	Girls, Violence, and Voice: The Role of Parents
9:30	Meghan Perkins (Berkey/Keyes)	At-Risk: Functional Categorization or Attitudinal Justification
9:45	Meredith Murphy-Gailey (Mullin)	Just Two More Pages . . . Please!: A Feminist Look at Gender Issues in Music Education
10:00	Rebecca Schack (Martinez)	Gender and Racial Identity Saliency: The Effects of Age, Race, Gender, and School Composition
10:15	Kelly Garland (Grossman)	World War II: The Changing Value of Women's Work and the Servicemen's Readjustment Act of 1944
10:30	Britt Halvorson (Mullin)	The Greening of Christianity: An Ethnographic Look at How Environmental Christians Powerfully Fuse Religion and Ecology
10:45	Elizabeth Brisson (Steinhauer)	Trade vs. Technology: Determining the Cause of the Widening Wage Differential
2:00	Kirk Myers (Togunde)	An Analysis of the Reconstruction and Development Programme's Impact on Housing in South Africa
2:15	Dana Cook (Grossman)	Israeli National Security and Its Impact on a Degenerating Peace Process
2:30	Kirsten Metalonis (Otto)	Elicitation of Maltreated Children's Representations of Their Mothers through the Use of a Story-Recall Task
2:45	Rebecca Swisher (Berkey/Keyes)	Adolescent Alcohol Consumption and Willingness to Participate in Drinking Behaviors
3:00	Todd Krost (Levine)	Congressional Elections and Leadership: As Seen in an Impeachment Semester
3:15	Jennifer Barr and Melissa Peterson (Berkey/Keyes)	Effects of Media, Peer, and Familial Influences on Female Adolescent Perceptions of Beauty
3:30	Kristin Moilanen (Hayes)	I'm Sorry: The Effects of Sex, Relationship, and Nationality on Apologies
3:45	Kelli Zappas (Grossman)	The Changing Nature of War: Cultural Conflict, Rape, and Genocide in the Balkans

HUMANITIES AND FINE ARTS FORUM—Bobbitt Auditorium

9:00	Lee Hull (Lockyer)	You Must Remember This: Telling the Stories of World War II
9:15	Brenda Green (Frick)	The Church in Kenya: Its Past and Prospects
9:30	John Govier (D. Clark)	The Effect of the Dix-Hill Cartel on the Civil War
9:45	Amy Reimann (Chytilo)	Tile Restoration of the Green Lobby Floor of the Kingswood School for Girls, Cranbrook
10:00	Jessica Pyman (Chavez)	Elegy for My Mothers
10:15	Melissa Peterson (Cocks)	The Female Experience and the Holocaust
10:30	Ryan Shirey (Diedrick)	Recovering James Hogg: Epistemology in <i>The Private Memoirs and Confessions of a Justified Sinner</i>
10:45	Aimee Mephram (Loukides)	"Women Found and Lost": Six Fiction Pieces
2:00	Claire Walton (Oosting)	The Design Process of Arthur Miller's <i>A View from the Bridge</i>
2:15	Christal Lint (Wickre)	The Politics of Funding the Arts: The Case of the 'NEA Four'
2:30	Olida Letourneau (Wickre)	Bentwood Furniture: A Comparison between Rustic American and European Design and Production
2:45	Amy Kenaga (Martinez)	The Influence of Grammatical Gender on Male/Female Noun Judgments in Spanish
3:00	Andrea Lindley (Wickre)	<i>Transcending Silence: The Tubs Project</i>
3:15	Ericka Webb (Collar)	Reading Language in the Fiction of Angela Carter
3:30	Jessica Sumner (Baumgartner)	The Women of Ravensbrück: A History of the Women's Concentration Camp
3:45	Bradley Scheck (Johnson)	Albion College's New Strength and Conditioning Program: Does It Improve Title IX Compliance?



NATURAL SCIENCES AND MATHEMATICS FORUM—Norris 103

9:00	Ryan Wagner (Schmitter)	The Effects of Supplemental UV-B Radiation on Chlorophyll Concentration, Protein Concentration, and Taxon-Specific Assemblages within a Periphyton Community
9:15	Paul DeRose (Lewis)	Synthesis and Analysis of Organic Films Composed of Poly(allylamine) and Poly(acrylic acid)
9:30	Jennifer Bujdos (R. Clark)	A Three-Dimensional GIS Model of the Southwest Albion Quadrangle
9:45	Rebecca Salus (Armstrong)	The Effects of Exercise on Leucine Metabolism in HIV+ Individuals: A Nutritional Study
10:00	Elizabeth Carson (Lewis)	An Optical Investigation of Reactive Glow Discharge Plasmas
10:15	Matthew Huber (Reimann)	Internet Presence and Acceptance in the Albion Small Retail Business Community
10:30	Brandon Selinsky (Hostetler)	The Effects of Game Stress on the Immune Systems of Soccer Players
2:00	Allison Wood (Hostetler)	The Relationship between Immunoglobulin A Levels and Extremely High and Low Levels of Test Anxiety
2:15	Marianne Franco (Klarr)	Intermediate Filament Disruption Affects Force Generation and Transmission in Vascular Smooth Muscle
2:30	Jennifer Simmons (Pearson)	Ultrasonic Repeller Effects on Flight and Reproduction of <i>Plodia interpunctella</i> (Lepidoptera: Pyralidae)
2:45	Jeffrey Goza (Saville)	Excision of a <i>Hobo</i> Transposable Element from the <i>Vg-al</i> Allele of <i>Drosophila melanogaster</i> Using Two Different Transposase Sources
3:00	Jennifer Smith (Kennedy)	The Effects of Leaf Removal, Cluster Height, and Wind Damage on Fruit Clusters of Two Bird-Dispersed Plants, <i>Rhus hirta</i> and <i>Rhus glabra</i>
3:15	Arthur Bragg (Bieler)	Construction and Characterization of a Laser-Induced Fluorescence (LIF) Spectrometer with a Pulsed, Supersonically Expanded Free-jet Molecular Beam Sample Source
3:30	Julie Vecchio (Kennedy)	The Contribution of Microphytobenthos to Estuarine Chlorophyll Concentrations

POSTER PRESENTATIONS—Gerstacker Commons, Kellogg Center, 1:00-1:45 p.m.

Gabrielle Bielak, Ray McMann, and Elise Schultz (Bieler)	The Mechanism and Characterization of the Photooxidative Polymerization of Pyrrole
Michael Blankinship (Harris)	The Alumina Supported Potassium Permanganate Oxidation of Oximes in the Presence of Alkenes
Christina Brandel (Johnson)	Do MIAA Athletic Participation and Academic Performance Correlate to Lifetime Success?
Michael DeYoe (Hostetler)	Procrastination Survey of College Professors
Teresa Eliason (Lewis)	GC-MS Analysis of the Photoreduction of Carbon Tetrachloride in Aqueous Solutions by Titanium Dioxide
Jovan Giaimo (Bieler)	Boxcars, Amplifiers, and Labview®: Adventures in Instrumentation Interfacing
Meredith Greene (Malinak)	The Proposed Synthesis of a New Metallomesogen
Rachel Hector (French)	Synthesis and Resolution of 2-Iodobenzhydrol
Holly Jacobs (Reimann)	Using Weiner Filtering to Measure the Modulation Transfer Function
Tamara Jaeger (T. Lincoln)	Analysis and Reformulation of Albany Slip Clay
Andrea Lindley (Saville)	Paternity Analysis in the Nurse Shark
Janna Muccio (French)	Isolation and Identification of the Male Mating Pheromone of <i>Agelenopsis aperta</i> , the Funnel- Web Spider
J. Otis Nelson (Harris)	Supplemental Alkene Reactions for Sophomore Organic Lecture
Caroline Scott (Rubio)	How Do Children Develop the Concept of Representational Mathematics?
Joseph Smith, '99 (Reimann)	Computer-Aided Instruction of Linear Least Squares Fitting
Nader Warra (Armstrong)	Environmental Toxin Inhibits Human Immune System Activity: Effects of Mercuric Chloride on Human Neutrophils

Faculty sponsors are listed in parentheses.



ANNE-MARIE BADENHORST, '99
SHEILA JOHNSON, '01
LISA LEITZ, '99

Girls, Violence, and Voice: The Role of Parents

Faculty Sponsors: Leonard Berkey and Barbara Keyes

Anne-Marie Badenhorst
 Major: Psychology
 Hometown: Winnetka, Ill.

Sheila Johnson
 Major: Sociology
 Hometown: Kalamazoo, Mich.

Lisa Leitz
 Majors: Sociology, Women's Studies
 Hometown: Mason, Mich.

This presentation will cover work related to the Building Assets in Middle School Girls project between the Sociology and Psychology Departments. Our work involves two groups of Albion Middle School students, some who have been disciplined for fighting and some who have not. Our study also included their parents. A series of interviews was conducted with the parents, and three standardized questionnaires were distributed to the same parents and their daughters. Interviews focused on the amount of time that the parents spend with their child and what activities take place during this time, as well as attitudes toward fighting and parental expectations for their daughter. Questionnaires provided scores for adaptability and cohesion in families in addition to family satisfaction and parent/adolescent communication. Interviews conveyed similarities between parents in expectations and attitudes toward fighting, but differences in the amount of time that the parents were able to spend with their daughter and outlooks regarding school. An analysis of the standardized scores yielded a significant difference between the two groups.

JENNIFER BARR, '00
MELISSA PETERSON, '00

Effects of Media, Peer, and Familial Influences on Female Adolescent Perceptions of Beauty

Faculty Sponsor: Leonard Berkey

Jennifer Barr
 Major: Psychology
 Hometown: Pittsford, Mich.

Melissa Peterson
 Majors: Sociology, Women's Studies
 Hometown: Lowell, Mich.

This project is designed to more closely examine what influences the outward appearance of adolescent females. The researchers hypothesize that familial influences would play a minimal role, while societal, primarily peer, influences would play the largest role. The primary research method used was rap sessions composed of female students, aged 12 to 15, from the Albion Public Schools. These sessions were facilitated by three female researchers—two Caucasian and one African-American. Each session included girls of different races and ages. All sessions were video recorded. In addition, field notes were compiled by other members of the research team. This project is in conjunction with the Building Assets in Middle School Girls program.

GABRIELLE BIELAK, '99
RAY McMANN, '99
ELISE SCHULTZ, '02

The Mechanism and Characterization of the Photooxidative Polymerization of Pyrrole

Faculty Sponsor: Craig Bieler

Gabrielle Bielak
 Major: Chemistry
 Hometown: Clarkson, Mich.

Ray McMann
 Major: Chemistry
 Hometown: Clawson, Mich.

Elise Schultz
 Major: Chemistry
 Hometown: Saginaw, Mich.

The conductive polymer polypyrrole can be synthesized by a variety of methods. One such method utilizes UV light to induce the polymerization of pyrrole by photooxidation. The efficiency of polymer production depends on a variety of factors. The wavelength of light that is effective in yielding product depends on the type of solvent used. Transient absorption measurements have been performed to show that the solvent molecule initially absorbs the light, then induces the oxidation of the pyrrole monomer. Additionally, the concentration of the pyrrole is important to the efficient production of the polymer. It has been observed that a variety of reaction products besides the polypyrrole are produced when concentrations above 0.5M pyrrole are used. The polypyrrole product has been characterized by elemental analysis, infrared spectroscopy, and conductivity measurements. The property of conductivity must be induced by 'doping' the polymer with I₂, and the magnitude of the conductivity depends on the length of time that the molecule is doped. The results of a systematic study of the variance of the conductivity on the doping time and stability of doping will be reported.



MICHAEL BLANKINSHIP, '99

The Alumina Supported Potassium Permanganate Oxidation of Oximes in the Presence of Alkenes

Faculty Sponsor: Clifford Harris

Majors: Chemistry, Biology
Hometown: Newberry, Mich.

Potassium permanganate has been known as a powerful aqueous oxidizing agent for decades. In 1981, it was demonstrated that potassium permanganate which is supported on alumina also readily oxidizes many functional groups in organic solvents. Alumina supported permanganate reagent (ASPR) exhibits chemoselectivity not shared by aqueous potassium permanganate. The oxidation of oximes to ketones via ASPR was studied with the intent to optimize reaction time, purity, and ease of product isolation. A competing reaction has been suppressed. A variety of oximes give ketones in good yield under these conditions in the presence of 1-octene.

ARTHUR BRAGG, '99

Construction and Characterization of a Laser-Induced Fluorescence (LIF) Spectrometer with a Pulsed, Supersonically Expanded Free-jet Molecular Beam Sample Source

Faculty Sponsor: Craig Bieler

Major: Chemistry
Hometown: Rochester Hills, Mich.

In order to simplify molecular emission spectra, we have undertaken the task of designing and constructing a molecular beam/laser-induced fluorescence (LIF) spectrometer. Electronic emission spectra of stagnant and effusive flow gases exhibit an extraordinary degree of complexity due both to sample impurities and randomness of molecular motion. Molecular state distributions—both rotational and vibrational—shift to higher states as ambient sample temperature increases. This gives rise to a great number of possible and observed vibrational and rotational transitions for any species-

specific electronic emission. Spectral features are also collisionally broadened as sample pressure (i.e., gas pressure) is increased. Because stagnant and effusive flow gas samples have relatively high operating temperatures and pressures, these effects make molecular electronic emission spectra of such sources either indecipherable or, at best, poorly resolved. As it has been shown, incorporating supersonic free-jet sources into gas-phase spectroscopic techniques greatly reduces spectral clutter. The well-resolved spectra obtained can provide detailed information about molecular energetic processes.

Our beam design consists of a home-made pulsed valve nozzle placed inside a high vacuum chamber (10^{-6} Torr). The molecular beam is produced by the supersonic free-jet expansion of a seeded gas sample into the vacuum through a 500 micron pinhole. The pulsed nozzle, constructed from the element of a piezo-driven audio speaker, is driven by a 200 volt, 30 microsecond square wave at 10 Hertz. The characteristics of the molecular beam produced by this method, such as pulse width and degree of cooling, can be probed with laser-induced fluorescence spectroscopy. Specifically, the beam will be characterized using the LIF technique by probing the expansion of a vapor-phase synapinic acid derivative (absorbing chromophore ~ 337 nm) seeded in a rare gas carrier.

CHRISTINA BRANDEL, '99

Do MIAA Athletic Participation and Academic Performance Correlate to Lifetime Success?

Faculty Sponsor: Thomas Johnson

Major: Physical Education- Exercise Science
Hometown: Saginaw, Mich.

The purpose of this study was to determine if participation in Michigan Intercollegiate Athletic Association (MIAA) athletics and high academic performance correlate to a more successful life in comparison to those who did not compete in athletics. Forty women were randomly selected from each of five classes of Albion graduates between the years of 1989 and 1993.

Two hundred surveys were mailed, one to each member of the sample. Results from the 81 completed and returned surveys (40% of 199) show that Albion graduates, both athletes and non-athletes, have high rates of success and job satisfaction. Sixty percent (49/81) were athletes at some point; 51 percent of them (25/49) competed at the collegiate level. Of that 51 percent, there was a higher average GPA (3.39: 3.369), higher average of job satisfaction (4.36: 3.87), and a higher success rate (4.28: 4.25). The differences are minimal showing that overall this sample is very successful and highly satisfied.

The results of this study help to disprove the idea of the "dumb jock" that many people have of those who participate in athletics. Athletes can and do attain success off the playing fields and after graduation.

ELIZABETH BRISSON, '99

Trade vs. Technology: Determining the Cause of the Widening Wage Differential

Faculty Sponsor: Larry Steinhauer

Major: Economics and Management
Hometown: Flushing, Mich.

Is trade the cause of the current immiseration of unskilled labor? And if so, how can a nation make trade a tide that truly raises all boats? Or perhaps technology is to blame for unskilled labor's plight? How should an ever-evolving society compensate the losers without forestalling technological progress? This thesis attempts to answer these questions from an economic standpoint and draw conclusions as to which of the competing theories best explains the widening wage differential. The economic theories behind both of these concepts are explained, including the classic model of international economics, the Heckscher-Ohlin model, and its two corollaries, the factor-price equalization theorem and the Stolper-Samuelson theorem. Current empirical approaches used to assess the magnitude of international trade's effect on the wages of unskilled labor, such as factor content analysis and price effects studies, are examined. Although the results of current research indicate that trade has had only a slight to modest effect, there are inherent



flaws in these studies that have a great impact on the estimate and prevent the studies from being entirely conclusive. Finally, current programs and new policy initiatives are explored in order to determine the correct remedy for the widening wage inequality. The inadequacies of current programs in their funding, scope, and implementation are addressed, and suggestions for correcting these problems are presented.

JENNIFER BUJDOS, '99

A Three-Dimensional GIS Model of the Southwest Albion Quadrangle

Faculty Sponsor: Russell Clark

Major: Geological Sciences
Hometown: Marshall, Mich.

This GIS model will be particularly useful to local community members (as the City of Albion has just begun using GIS) and to Albion College students (as this quadrangle is often used as a project area in introductory geology courses).

A GIS is a computer system that displays, analyzes, enhances, and stores any type of spatial information. Each category of spatial data is considered to be a separate layer in a GIS model. Any or all of the layers can be shown in three-dimensional form, so that their relationships can be easily visualized. In addition, a GIS allows direct quantitative comparison and statistical analysis of two or more layers. The types of physical data used in this project include elevation; land-use and land cover; location of towns, rivers and lakes; depth to ground-water table; depth to bedrock; surficial and bedrock geology; and the location of wetland areas. Low-level aerial photography and Landsat satellite imagery data are used to illustrate differences in vegetation and soil types.

The utility of this model is demonstrated by using it to select the best location for a solid waste disposal site within the Southwest Albion Quadrangle using Michigan Department of Environmental Quality Waste Management Division regulations. The entire project can be viewed on an Internet Map Server World Wide Web site.

ELIZABETH CARSON, '99

An Optical Investigation of Reactive Glow Discharge Plasmas

Faculty Sponsor: Lisa Lewis

Major: Chemistry
Hometown: Wyandotte, Mich.

Tetrafluoromethane, a reactive gas, (CF_4 , 1.01% by weight) was added to the argon support gas of a hollow cathode glow discharge to explore the effect CF_4 has on the plasma processes of various elements. Analysis was done by studying the atomic emission and sputtering rates when the CF_4 was added and by comparing the results to those of the pure argon support gas. Three elements were examined: silicon, copper, and aluminum. When a silicon cathode was probed, the sputtering rate (as measured by weight loss or gain) was enhanced by a factor of 34. The atomic emission intensity was also increased by a factor of 1.5. This enhancement is believed to have resulted from etching of the silicon by fluorine, a by-product from the dissociation of CF_4 in the discharge. When a copper cathode was analyzed, the atomic emission intensity was reduced by a factor of two upon the addition of CF_4 . The sputtering rate was also reduced by a factor of 18. This suppression is believed to have resulted because involatile fluorides are formed on the surface with the addition of CF_4 . The analysis of aluminum showed an enhancement in the atomic emission by a factor of two, but no change in the sputtering rate. It is believed that the CF_4 affects the excitation of the aluminum atoms, but further investigation is required to fully understand these processes.

DANA COOK, '99

Israeli National Security and Its Impact on a Degenerating Peace Process

Faculty Sponsor: Andrew Grossman

Major: Political Science
Hometown: Port Huron, Mich.

The fundamental basis of the conflict over the land of Palestine is that the Jews and the Palestinians find an equal claim to the land, and each wants to establish their own autonomous nation-state there. Thus far, only Israel has been successful in declaring autonomy in Palestine, which has created hostility with its Arab neighbors. The persistence of external and internal threats has simultaneously created the strategic culture of Israel, a structure that is overlooked by the Declaration of Principles within the Oslo Accords. The resentment among Palestinians that exists due to the oppression and the persecution of the Palestinians who still live within Israel's borders as well as to the isolation of those who do not creates a constant security threat to Israel. The willingness to negotiate does, however, exist. The Palestinians and the Israelis have each recognized the other and actually set a structure to achieve a peaceful agreement.

Due to the Jewish people's collective memory of persecution, Israeli national security has consistently maintained that its most central focus is security for the Jewish people at all costs. Focusing on victimization by non-Jews is what makes this argument rational and this identity of victim-hood has resulted in many social and political consequences within Israeli society. The national security of Israel is at the forefront of all strategic thinking, and explains the foreign policy trends of the nation. This paper attempts to analyze the national security policy of Israel and to explain why the stalemate in the implementation of the Declaration of Principles in the Oslo Peace Agreement reinforces policies that ignore the security and the land issues that are at the root of the conflict. Thus, because the Declaration of Principles does not allow for the security and land requirements necessary for peace between a democracy and non-democracy, it cannot serve as a viable means



for achieving peace. What is clear is that until Israel's requirements for peace under its quintessential neorealist premises are fulfilled, conflict resolution will be difficult to achieve.

PAUL DEROSE, '00

Synthesis and Analysis of Organic Films Composed of Poly(allylamine) and Poly(acrylic acid)

Faculty Sponsor: Lisa Lewis

Major: Biology
Hometown: Holt, Mich.

Ultrathin organic films show potential in the areas of biosensing, friction reducing coatings, and corrosion inhibition. Layer by layer absorption of polyelectrolytes is an effective method of constructing ultrathin organic films. Polyelectrolyte films composed of poly(allylamine hydrochloride) and poly(acrylic acid) are characterized by IR and optical ellipsometry. Increases in film thickness occur with higher concentrations of salt in the polyelectrolyte solutions. Heating at 130°C for 72 hours induces the formation of amide cross-linkages between the two polymers. The peak currents of cyclic voltammograms of polyelectrolyte films before and after cross-linking show little change (<15%) at pH3, 6 and 10. Cyclic voltammetry also shows that cross-linked films have lower peak currents and therefore are less permeable.

MICHAEL DEYOE, '99

Procrastination Survey of College Professors

Faculty Sponsor: John Hostetler

Major: Psychology
Hometown: Albion, Mich.

This study was designed to study procrastination among college professors. It was hypothesized that, first, non-tenured college professors will be more likely to procrastinate than tenured professors, and secondly, those who report higher levels of day-to-day stress will most likely procrastinate more than those who report less stress. The third hypothesis was that those professors who consider themselves perfectionists will procrastinate at higher levels than those who don't consider themselves perfectionists. Also the effects that gender, number of years of teaching, tenure status, academic division, and time the survey was returned were considered. Data were analyzed using analysis of variance. The only variable that showed a significant main effect was time of returning the survey. It appears that such variables as sex, years of teaching, and tenure status cannot be used to predict procrastination on the part of college professors.

TERESA ELIASON, '99

GC-MS Analysis of the Photoreduction of Carbon Tetrachloride in Aqueous Solutions by Titanium Dioxide

Faculty Sponsor: Lisa Lewis

Major: Chemistry
Hometown: Grand Blanc, Mich.

The photoreduction of carbon tetrachloride in aqueous solutions by titanium dioxide was studied using gas chromatography-mass spectrometry (GC-MS) with headspace equipment. As consistent with previous work, we have observed that the addition of an electron donor such as ethanol to aqueous solutions enhances the reduction rate of carbon tetrachloride. In addition, we have observed the formation of a byproduct,

diethoxyethane. The observation of the acetal suggests that acetaldehyde (CH_3CHO) is formed during the oxidation/reduction process. This supports a previously proposed mechanism in which ethanol serves as an electron donor forming an alpha-hydroxyalkyl radical, a strong one-electron reductant (-0.94V), and upon oxidation yields CH_3CHO , H^+ , and an electron. The potential for oxidation is enough to inject electrons into the conduction band of titanium dioxide or to directly reduce carbon tetrachloride.

MARIANNE FRANCO, '99

Intermediate Filament Disruption Affects Force Generation and Transmission in Vascular Smooth Muscle

Faculty Sponsor: Susan Klarr

Major: Biology
Hometown: West Branch, Mich.

The exact role of the cytoskeleton in smooth muscle is yet to be determined. This study tested the hypothesis that in vascular smooth muscle, intermediate filaments play a role in cellular force generation and transmission. The effects of acrylamide (ACR), an intermediate filament disrupter, were examined on contractions induced by phenylephrine (PE), the protein kinase C activator phorbol dibutyrate (PDBu), and potassium chloride (KCl). Aortic rings taken from male Sprague Dawley rats were placed in muscle baths and attached to force transducers to allow for isometric force measurement. Tissues incubated in ACR (3 mM) for 60 minutes exhibited a decreased maximal contraction to PE ($3 \times 10^{-6}\text{M}$) by 31%, to PDBu ($3 \times 10^{-6}\text{M}$) by 61% and to KCl (60 mM) by 51%. Tissue sensitivity to KCl and PE did not appear to be affected by ACR treatment when the contractile responses were graphed as a percentage of maximal agonist induced contraction. A sustained contraction was not achieved with PDBu in the ACR-treated rings, suggesting a possible relationship between protein kinase C and intermediate filaments. These results support the hypothesis that force generation and transmission in vascular smooth muscle rely on intermediate filaments.

**KELLY GARLAND, '99****World War II: The Changing Value of Women's Work and the Servicemen's Readjustment Act of 1944**

Faculty Sponsor: Andrew Grossman

Major: Political Science
Hometown: Prospect Heights, Ill.

In this paper, I am addressing the issues that faced American war workers on the home-front during World War II, and the lack of compensation they received for their effort at the war's end. My research uses not only government-sponsored propaganda, but also statistics and personal accounts from working women in both the pre-war and wartime era, finishing just after the conclusion of World War II.

Much of the increased acceptance and the increased value placed on women's work was due to government-sponsored propaganda during the war. This propaganda, which was published by the Office of War Information, urged women not only to work during the war, but also to return home upon the war's end. Yet as the end of the war dawned, these women workers were excluded from the largest and most wide-sweeping piece of public policy legislation ever, the Servicemen's Readjustment Act of 1944. Through a close examination of the debates in Congress and the Congressional Committee regarding this piece of legislation, it became apparent that this exclusion from the bill was due not only to the value placed on women's work, but is also related to the issue of states' rights and the distribution of financial benefits.

My research is significant not only for the way in which women's work was regarded during the wartime effort, but also for the way in which the legislative issues related to this bill were dealt with in Congress in a way that appeared all involved.

JOVAN GIAIMO, '00**Boxcars, Amplifiers, and Labview®: Adventures in Instrumentation Interfacing**

Faculty Sponsor: Craig Bieler

Major: Chemistry
Hometown: Wyandotte, Mich.

The construction of a laser-induced fluorescence apparatus involves the use of electronic instrumentation to help convert the observed signal into readable form. These electronics and accessories include: photo-multiplier tube (PMT), signal amplifier, boxcar integrator, pulse generator, A/D computer interface board, and computer software. The observed fluorescence signal is a pulse of light about 100 ns wide. This signal is detected by the PMT and an electrical pulse is produced. This pulse must be amplified, then integrated to produce a constant voltage. This analog signal is then converted to a digital signal that the computer can understand. By combining these pieces of equipment and utilizing a modular-based computer programming software package (Labview® 4.0), data obtained by the PMT could be recorded and displayed on the computer monitor. This data can then be stored for further analysis.

JOHN GOVIER, '99**The Effect of the Dix-Hill Cartel on the Civil War**

Faculty Sponsor: Daniel Clark

Major: History
Hometown: Battle Creek, Mich.

Historians of the United States Civil War have occasionally focused on prisoners of war, but their focus has been almost exclusively on prison conditions. My research places prisoners in the larger context of winning and losing the war. In the opening stages of the war, prisoners were informally exchanged on the battlefield between the two hostile forces. Later, by July 1862, after battles—such as Fredericksburg and the Seven Days Battle—became too large

to accommodate these informal exchanges, the Dix-Hill cartel was established to formally trade the prisoners of war back to their respective armies. In April 1863 the cartel was brought to a halt by the Union and was not resumed until four months before the end of the war.

Although countless histories have been written about factors that determined the outcome of the Civil War, none have considered the breakdown of the Dix-Hill cartel as a possible reason for the Union's victory and the Confederacy's defeat. By exploring the original documents contained in the *War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, I have concluded that the end of the cartel affected the outcome of the war. My research demonstrates that the Union did not suffer as much as the Confederacy by the halt of the exchange cartel. The loss, to the Confederacy, of captured soldiers caused the Southern armies to be undermanned and thus less effective fighting forces which, in part, caused them to lose the war.

JEFFREY GOZA, '99**Excision of a *Hobo* Transposable Element from the *Vg-al* Allele of *Drosophila melanogaster* Using Two Different Transposase Sources**

Faculty Sponsor: Kenneth Saville

Major: Biology
Hometown: Rochester Hills, Mich.

The vestigial (*vg*) gene is needed for the proper development of the thorax (including the wings and legs) of the fly. The *hobo* transposable element is a section of DNA that can be inserted or removed (excised) from chromosomes via the action of a *hobo* transposase protein. The vestigial-almost (*vg-al*) allele is a natural mutant variation caused by an insertion of the *hobo* element into a part of the *vg* gene. Flies with two copies of this mutant allele have wings approximately one-half the normal size. The purpose of the experiments described here was to determine the relative ability of two different *hobo* transposase sources to induce the *hobo* element to jump out of the *vg* gene. Information gained about these transposase sources



will then be used to determine the best method for mobilizing this *hobo* element for further studies on its mechanism of movement. Each of the transposase sources to be tested is under the control of a 'heat shock' control element, which causes the transposase to be expressed following heat shock conditions (37°C for one hour), but not at normal incubation temperatures (24°C). Flies carrying either of the two transposase sources were mated with flies carrying two copies of *vg-al*. The offspring of this cross contain both the *vg-al* allele with the inserted *hobo* element, and one copy of the transposase source. These flies were heatshocked as larvae to induce expression of the transposase. Adult males were then mated to a 'tester' strain to determine if the *hobo* element had jumped out of the *vg-al* allele. It was expected that, because the *vg-al* phenotype is caused by the *hobo* insertion, those flies in which *hobo* has excised would exhibit normal wings. However, preliminary results suggest that mobilizing this *hobo* element with these transposase sources might be lethal to the flies.

BRENDA GREEN, '99

The Church in Kenya: Its Past and Prospects

Faculty Sponsor: Frank Frick

Majors: Religious Studies, Music
Hometown: Downers Grove, Ill.

This paper will be an examination of the past, present, and future of the church in Kenya. Through an examination of the leading authors in the field, both European and African, this paper will examine the past and the present that bring light to the hurdles that the church of the future must overcome.

Christianity arrived in Kenya with Portuguese explorers in 1598 but was not firmly established until the colonial era. As a result of being established in the colonial era with colonial ideology, there are many theological differences between the present church in Kenya and the present church in the West, and it is significantly behind the Western church in terms of their views of indigenous leadership, acceptance of

differences, and other theological issues. A unique African theology is central to creating an African sentiment of ownership of the Christian faith.

The future of the church is complicated by the overwhelming political and economic problems that plague everyday life in Kenya. The church must have a role in social justice. The indigenization of the church is a necessity to create a self-sufficient church with a message relevant to the new generation of Kenyans. Indigenization begins with the training of indigenous leadership and the financial independence of the church as an institution. The creative arts as an expression of faith are a way to both gauge and encourage the indigenization. The music of worship and architecture of churches in Kenya are symbolically significant to the struggle for relevant expressions of an African Christian faith.

MEREDITH GREENE, '99

The Proposed Synthesis of a New Metallomesogen

Faculty Sponsor: Steven Malinak

Majors: Chemistry, Spanish
Hometown: Indianapolis, Ind.

Liquid crystals which contain one or more metal ions are collectively known as metallomesogens. Magnetic interactions between the paramagnetic metal centers in the liquid crystalline state may lead to interesting applications for this class of compound. We propose a synthesis for a metallomesogen which may contain as many as five uncoupled paramagnetic centers. We will provide an overview and update the progress of the synthesis.

BRITT HALVORSON, '99

The Greening of Christianity: An Ethnographic Look at How Environmental Christians Powerfully Fuse Religion and Ecology

Faculty Sponsor: Molly Mullin

Majors: Anthropology, English
Hometown: Muskegon, Mich.

According to many Christian scholars, the development of "Green" Christianity has occurred within the last 15 years. This movement, or revival as some refer to it, is encouraging Christians to address environmental issues primarily using the model of the Christian steward. The creation story of the Bible is also a central focus of this movement, which draws upon the idea that humankind's duty is to "till and keep" the earth rather than to have dominion over it. Environmental Christians often cite Lynn White, Jr.'s 1967 article, which argued that Christianity's anthropocentrism was to blame for the contemporary environmental crisis, as being a motivating force for their activism.

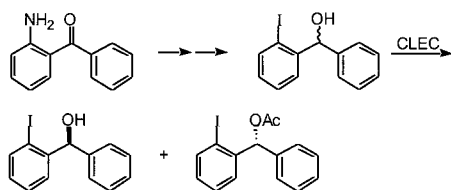
My thesis focuses on Christians' active, organized work to alleviate environmental problems and looks at the influence this work is having and will have on Christianity and the environmental movement. Specifically, my research addresses the impact this movement will have on our environmental problems, by focusing on the immense influence religion has on personal conduct. It examines how individuals integrate an active interest in environmental issues with their personal religious beliefs and foundation. These ideas were explored using anthropological methods: I conducted participant observation with two Christian environmental groups in Michigan and interviewed nine "Green" Christians, members of both organizations. My research reveals how "Green" Christians not only weave environmental concern into their already present religious framework, making it a stable part of their identities, but also how this combination is a powerful guide to personal behavior and activism.

**RACHEL HECTOR, '00****Synthesis and Resolution of 2-Iodobenzhydrol**

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Wyandotte, Mich.

Chiral non-racemic 2-iodobenzhydrols are synthetic precursors to chiral hypervalent iodine reagents. Synthesis of racemic 2-iodobenzhydrol from 2-aminobenzophenone was performed and resolution of racemic 2-iodobenzhydrols was accomplished through the use of cross-linked enzyme crystals (CLEC). The details of the CLEC technology and results of this resolution will be discussed.

**MATTHEW HUBER, '99****Internet Presence and Acceptance in the Albion Small Retail Business Community**

Faculty Sponsor: David Reimann

Major: Computer Science
Hometown: Rochester Hills, Mich.

This project is an attempt to move the community of Albion one step closer to the cutting edge of technology. It is multi-faceted and has several goals. We are giving interested small retail businesses of Albion a presence on the World Wide Web, and then monitoring the community response and effectiveness of those businesses on the Web. We are also formulating a list of concerns the business community has with the Web. In this initial phase of an ongoing project, there has been both positive and negative response from the small business community. The positive response has been a smaller percentage, but in general those who are interested are very enthusiastic about it. The negative responses are generally either not

understanding the Internet or not expecting the return to equal the investment of time. With a strong online presence, the local businesses can be more visible to those who would otherwise not know of their offerings, especially those new to the Albion community, including new and prospective students.

LEE HULL, '99**You Must Remember This: Telling the Stories of World War II**

Faculty Sponsor: Judith Lockyer

Major: English and American Culture
Hometown: Tipton, Ind.

This project began as an investigation of the legacies of World War II in American culture. In fiction and film, in our schools and our national monuments, and for a while longer, in our oldest generation, America preserves WWII as the last war Americans fought in which we were as united on the home front as we were in battle. "You Must Remember This" is a study of the war as experienced by members of the Hull family. Extensive interviews with the author's grandparents, Richard Hull and Lois Dorazio, comprise the core of the thesis. The process of writing the thesis occurred in three stages: formulating questions and doing research on historical presentations of life in America during WWII; conducting and transcribing the formal interviews; and integrating the interview material with research on memory and narration, as well as on the war itself. In addition to preserving the stories of this family, the thesis investigates the following: Why are World War II stories so important in our culture? What is the legacy the stories give us? What is our collective memory of this time and how do we understand its accuracy and significance as historical and personal legacy?

HOLLY JACOBS, '01**Using Weiner Filtering to Measure the Modulation Transfer Function**

Faculty Sponsor: David Reimann

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

Conventional Weiner filtering takes the Fourier transform of the blurred image and divides it by the Fourier transform of the blurring function, resulting in the Fourier transform of the image as if it had been acquired with no loss of resolution. This is referred to as image restoration. This concept is being used, but only in a reverse way, to measure the modulation transfer function (MTF) of the imaging system by using a simple object, namely a circle. A blurred image is acquired, and then its Fourier transform is computed. Then, using the mathematical simplicity of the circle, the exact Fourier transform of the ideal circle is calculated. The Fourier transform of the blurred image is then divided by the circle's Fourier transform point by point. This results in the MTF of the imaging system. This method is useful in radiological imaging because it can be easily applied to measure MTFs as a part of routine quality assurance and to quantitatively compare different imaging systems.

TAMARA JAEGER, '99**Analysis and Reformulation of Albany Slip Clay**

Faculty Sponsor: Timothy Lincoln

Majors: Anthropology, Visual Arts
Hometown: Sterling Heights, Mich.

The purpose of this project was to analyze Albany Slip clay and to attempt to synthesize an acceptable replacement. Albany Slip clay is an important component in many ceramic glazes and is one of only a handful of naturally occurring clays that can be used as a glaze in its natural state. Albany Slip clay, glacial silt from the Hudson River near Albany, NY, consists of pulverized rock and



contains large quantities of fluxing materials that lower the melting point of the compound. This clay forms a dark brown-black glaze when fired to cone 10 (2381°F). Albany Slip clay is no longer commercially available. This has had far-reaching effects on the ceramics community, necessitating drastic reformulations of many glaze recipes and resulting in several moderately successful attempts at formulating an acceptable replacement.

Our X-ray fluorescence analysis of Albany Slip and two other commercially available replacements, Alberta Slip clay (Plainsman Clays, Ltd.), and synthetic Albany Slip clay (Ceramic Supply of NY & NJ) shows the following compositions:

Compon.	CaO	Fe ₂ O ₃	MgO	K ₂ O	SiO ₂
True Alb.	5.8	5.0	3.8	3.0	58.6
Alberta	6.1	4.6	3.6	3.0	58.6
Syn. Alb.	5.0	5.4	5.5	3.6	54.9

Compon.	Al ₂ O ₃	Na ₂ O	TiO ₂	MnO	L.O.I.	Sum
True Alb.	13.9	1.2	0.7	0.16	6.6	98.8
Alberta	13.6	2.4	0.4	0.04	8.5	100.7
Syn. Alb.	16.8	1.0	0.7	0.22	4.8	97.7

The closest match to true Albany Slip was the Alberta Slip. Addition of magnesium, iron, manganese, and titanium should correct the color to more closely approximate that of the Albany Slip. Alternatively, a new synthetic Albany Slip can be synthesized using the individual oxides present in Albany Slip clay.

CORINNE JOHNSON, '99

Putting *The Clash* into Context: The Significance of Huntington's Thesis

Faculty Sponsor: Andrew Grossman

Major: Political Science
Hometown: Iron Mountain, Mich.

The theory that Samuel P. Huntington posits in his article, "The Clash of Civilizations?," and his following book, *The Clash of Civilizations and the Remaking of World Order*, argues that wars of the intensely globalized post-Cold War future will be large scale wars of annihilation among civilizations, rather than wars among nation-states that have instrumentally rational goals. In a globalized world, it is essential for the United

States to take Huntington's warnings seriously. The United States' society has become far too fragmented with many groups looking to their culture for their sense of identity rather than their nation-state. Globalization has led to a declining significance of the nation-state. Because the United States is heterogeneous, it has especially experienced the resounding effects of globalization.

To deal with a rapidly globalizing world, it is imperative for the United States to work to unify its society. No group should feel excluded from the cultural whole. Rather, the United States government should promote the nation as a main source of identity for all of its citizens. Both policies that unify and policies that increase patriotism, such as American cultural education, should be implemented. These types of policies are necessary for the continued security of the American nation-state.

SHEILA JOHNSON, '01

(See Anne-Marie Badenhorst, Sheila Johnson, and Lisa Leitz)

AMY KENAGA, '99

The Influence of Grammatical Gender on Male/Female Noun Judgments in Spanish

Faculty Sponsor: Ivelisse Martinez

Majors: Psychology, Spanish
Hometown: Portage, Mich.

This paper reports on a study using reaction time to examine differences in noun judgments of Spanish and English speakers. Forty-eight participants (24 native Spanish speakers and 24 native English speakers) completed a computer task in their native language in which they were presented with words that they placed into categories by pressing a right or left key. The types of words used were feminine proper nouns, masculine proper nouns, objects, and foods. The researchers hypothesized that, for "conflicting" nouns, Spanish speakers would have longer reaction times. Reaction time was recorded by the computer for each of 360 trials per participant. The results

indicate that Spanish speakers have significantly longer reaction times for each type of word, not just the "conflicting" nouns. The researchers concluded that these results imply that Spanish speakers and English speakers complete different cognitive processes for categorization of nouns as a result of the grammatical gender marking in Spanish language. Different cognitive processing models that explain this finding are discussed.

TODD KROST, '00

Congressional Elections and Leadership: As Seen in an Impeachment Semester

Faculty Sponsor: Myron Levine

Major: Political Science
Hometown: Chillicothe, Ill.

Last semester I interned in my home congressional district in Peoria, Ill., under Republican Congressman Ray LaHood. The internship was especially unique in two aspects: I witnessed the day-to-day operations of a congressional office during an impeachment, and I was able to meet former House Minority Leader Bob Michel. The impeachment hearings in the Judiciary Committee and House floor sparked an overwhelming response from the constituents. In the four-month period in which I worked in the office, we received over 5,000 telephone calls about impeachment alone. It was my job to listen to the constituents and update the congressman daily on what they said. Also, the office received increased media coverage as Mr. LaHood was chosen to preside over the impeachment debate in the House. Everyone from Sam Donaldson to Geraldo Rivera wanted an interview with my boss. The second significant aspect of my internship was that I was able to meet former Republican Congressman Bob Michel. Mr. Michel was the longest serving member of Congress never to serve in the majority. He came in when the Democrats took control in the fifties and left when the Republicans gained the majority in 1994. I found him extremely cordial and open about his career in my casual conversations with him.

**LISA LEITZ, '99**

(See Anne-Marie Badenhorst, Sheila Johnson, and Lisa Leitz)

OLIDA LETOURNEAU, '99**Bentwood Furniture: A Comparison between Rustic American and European Design and Production**

Faculty Sponsor: Bille Wickre

Majors: Art History, Anthropology
Hometown: Alma, Mich.

"... the Chair. We use it continually and we may have strong feelings about it but we rarely pause to see it as a response to particular cultural, technological, economic, and social conditions." (Edward F. Seckler, *Form from Process*, 1967) The rocking chair, an "American institution," has developed over the years into a cherished piece of furniture in every American home. Its development and function in American and European society have been contrasting from the very beginning. The rocking chair, a household object that American society so readily accepted, took several more generations before Europeans would use it in their home. Even when the bentwood furniture company Thonet, started by Michael Thonet, began production of bentwood rockers Europeans were slow to accept the rocker. Soon after the development of the bentwood rocker by Thonet, rustic bentwood rockers began expansion in America. These bent twig and branch rockers started production in the Adirondack mountains, along with a whole series of rustic-inspired furniture. Elements of European design and the production process were soon mimicked in the Adirondack mountains, as well as in furniture companies from the Midwest. The development of the design and function of the bentwood rocking chair has changed the meaning and function of rocking chairs across Western society. It is through these changes that the commercialization of the rocking chair began.

ANDREA LINDLEY, '99**Transcending Silence: The Tubs Project**

Faculty Sponsor: Bille Wickre

Majors: Art History, Biology
Hometown: Dearborn Heights, Mich.

In the spring of 1996, two professors, an artist-in-residence (Bradley McCallum), seven other Albion College students, and I formed an artistic collective and embarked into the world of collaborative art. Our work, *Transcending Silence: The Tubs Project*, spoke out against the horrors of domestic violence and illuminated the path three women took to break out of its cycle. We interviewed survivors of domestic violence at S.A.F.E. Place, a domestic violence shelter in Battle Creek, Mich., in order to delve into the emotions that domestic violence creates.

In creating our artwork, the collective edited the testimonies of the survivors and sandblasted the most riveting portions of their testimonies into the interior of antique bathtubs. We then installed the tubs in Victory Park (the central park of the city), plumbing water out of the river, through the tubs, and, finally, back to the river. This allowed water from the Kalamazoo River to pour peacefully through their faucets, streaming over the words on the inside of the tubs. The tubs became symbols of cleansing and renewal. By exposing the intimate stories of domestic violence to the public, our piece served both to heal wounds of domestic violence survivors and ingrain an abhorrence of domestic violence in all who saw the work.

The survivors of domestic violence with whom we worked in *Transcending Silence: The Tubs Project* were triumphant in their freedom, and I feel that our artwork was instrumental in their realization of the world's compassion.

ANDREA LINDLEY, '99**Paternity Analysis in the Nurse Shark**

Faculty Sponsor: Kenneth Saville

Majors: Art History, Biology
Hometown: Dearborn Heights, Mich.

Previous studies have shown that female nurse sharks will mate with several different males in a single mating season. However, it is not known if matings of a female nurse shark with multiple males can lead to multiple paternity in a single brood of offspring. To address this question, we have developed a PCR-based paternity test. This test takes advantage of naturally occurring polymorphisms at the major histocompatibility class II alpha (MHC II A) locus of the nurse shark, proven to be highly polymorphic (Kasahara et al., 1992, *Eur. J. Immunol.* 23: 2160-2165). In this method, DNA was isolated from captive mothers and their offspring. Samples from the father(s) were not available. The MHC locus from the mother and offspring was amplified using PCR, and polymorphisms were detected by RFLP analysis and comparative DNA sequences. The results of our pilot study using this PCR-RFLP strategy on a mother and seven pups did not produce evidence for multiple paternity. A larger scale experiment using a mother and 32 pups is in progress.

CHRISTAL LINT, '99**The Politics of Funding the Arts: The Case of the 'NEA Four'**

Faculty Sponsor: Bille Wickre

Major: Art History
Hometown: Armada, Mich.

The National Endowment for the Arts (NEA) is an independent governmental agency established in 1965 by President Lyndon Johnson. In a statement of purpose, Congress declared: "... it is necessary and appropriate for the Federal Government to help create and sustain not only a climate encouraging freedom of thought, imagination, and inquiry, but also the material conditions facilitating the release of this creative talent."



During the late eighties and early nineties, a handful of grants awarded by the NEA proved to be polemical, firing a controversy that escalated into a debate issue of the 1992 presidential campaign. After a number of attempts by conservatives to pass legislation to regulate the art funded by the NEA, Congress passed the Williams/Coleman Amendment requesting the NEA to: “ensure artistic excellence and artistic merit [in awarding grants], taking into consideration general standards of decency and respect for the diverse beliefs and values of the American public.”

A lawsuit was filed by four performance artists challenging the constitutionality of the Williams/Coleman Amendment. Led by feminist artist Karen Finely, the suit charged the language of the amendment: (1) violated First Amendment rights of applicants, and (2) violated the Fifth Amendment, therefore being void for vagueness. Both a federal district court and a federal appeals court ruled in favor of the artists, but the U.S. Supreme Court overturned the lower courts' decisions.

Using the surrounding context and previous Supreme Court decisions, I build an argument against the Supreme Court's ruling in *Finely v. The National Endowment for the Arts*. Focusing on the issue of the freedom of expression, I conclude that not only has the Court rendered a decision that violates the rights of NEA applicants, but its conclusion also runs antithetical to the very essence of the First Amendment.

RAY McMANN, '99

(See Gabrielle Bielak, Ray McMann, and Elise Schultz)

AIMEE MEPHAM, '99

“Women Found and Lost”: Six Fiction Pieces

Faculty Sponsor: Paul Loukides

Major: English
Hometown: Dearborn, Mich.

“Women Found and Lost” is a series of six interrelated fiction pieces. The series observes the lives of several different women

who work at an independent arts magazine in New York City. Each piece focuses on one woman, her professional life, her personal relationships, and her relationship to the city itself. The series as a whole observes the women's connections with each other as well as what they can and cannot know about one another.

“Elise,” the first piece, depicts a young intern's discovery of the city of New York, her search to find a niche for herself and her development as a poet. In “Natalie,” a graduate student surveys the wreckage of an abusive relationship and her own feelings of immobility. An editor deals with issues of identity and independence as she moves in with her lover in “Rachel,” and in “Mary Ann,” a middle-aged art buyer and advertising executive reacts to the death of a former lover and father of her child. In “Val,” the editor-in-chief and part-owner of the magazine faces the challenges presented by losing her share of power in the publication and also with her mother's loss of memory. The series ends as the magazine is bought by a large corporation, and the staff must move on to pursue different projects.

With attention to craft and sensitivity to language, “Women Found and Lost” examines the complexity of the lives of several contemporary, urban women.

KIRSTEN METALONIS, '99

Elicitation of Maltreated Children's Representations of Their Mothers through the Use of a Story-Recall Task

Faculty Sponsor: Amy Otto

Major: Psychology
Hometown: Solon, Ohio

Internal working models, the small-scale models of external reality we create within our minds, provide us with information about who our attachment figures are and how they view us. For maltreated children, these models may reflect the predominately negative interactions they have had with their care givers. Research has shown that story recall tasks access children's scripts and internal working models, but it has yet to show that the attachment relationship can be represented in a recall task. The present

study utilized just such a recall task to examine if maltreated children would recall and intrude more negative material than non-maltreated children. Sixty-two 4- to 6-year-old maltreated and non-maltreated children matched for age, sex, race, and SES were presented with a series of eight short stories in which the mother character acted in both helpful and unhelpful ways with her child. The children retold the stories using props, and their responses were coded for correct recall of presented material and intrusions of extraneous material. Results of multiple regression analyses yielded several significant age effects but no significant maltreatment effects, indicating that the intrusion of additional material was dependent upon the child's ability to recall what was presented, and thus ultimately dependent upon age. In addition, significantly more negative than positive representations of the mother were made regardless of maltreatment status, which may be explained by research on children's bias toward negative judgments that exists until around age eight.

Co-authors: Robert Clyman, M.D. and James Tobin, M.A.: Children's National Medical Center, Washington, D.C.

KRISTIN MOILANEN, '99

I'm Sorry: The Effects of Sex, Relationship, and Nationality on Apologies

Faculty Sponsor: William Hayes

Major: Psychology
Hometown: Fenton, Mich.

In this study, apologies were examined in relation to age and gender of victims, relationship of victim to participant, and sex and nationality of respondents. Four different versions of a questionnaire loosely based on Huckestein's (1997) study were developed, varying across the dimensions of gender and age of victim. One hundred ninety-one participants from North America and Europe completed the questionnaire, with approximately 25 percent of the sample using each form, and roughly equal amounts of men and women. A repeated-measures ANOVA demonstrated several significant



results (pœ.05), including the unexpected effect of the 12 individual situations used. Friends and family members were more likely to receive apologies than strangers, and women both gave and received more apologies than men. Nationality did not have a significant effect, although Europeans were less likely to apologize than North Americans, especially to family members. No effect was found for the age of victim. It can be concluded that gender and relationship have a role in whether an apology is offered to a person one has harmed.

JANNA MUCCIO, '00

Isolation and Identification of the Male Mating Pheromone of *Agelenopsis aperta*, the Funnel-Web Spider

Faculty Sponsor: Andrew French

Major: Biology
Hometown: Big Rapids, Mich.

The mating ritual of *Agelenopsis aperta* involves an elaborate "mating dance." The male spider moves close to the female and a cataleptic event occurs in the female. Mating proceeds only after this cataleptis. Initial testing of male funnel-web spider homogenate samples revealed evidence of possible male mating pheromone(s) as marked by the observation of the cataleptic event when homogenate samples were warmed in the presence of female spiders. Two strategies for the isolation of possible pheromone(s) were implemented. (1) The air above mating spiders was filtered through a Porapak-Q (polyvinylpyrrolidone) trap in a specially designed mating chamber and the porapak analyzed after multiple matings. (2) Twenty-one male spiders were homogenized in a buffer, centrifuged, and the aqueous supernatant isolated. Headspace GC-MS was performed to identify volatile components. Results of these strategies will be discussed.

MEREDITH MURPHY-GAILEY, '99

Just Two More Pages . . . Please!: A Feminist Look at Gender Issues in Music Education

Faculty Sponsor: Molly Mullin

Major: Anthropology
Hometown: Oxford, Mich.

The study and practice of music has frequently been defined as too lofty and aesthetic an experience to be subject to social criticism, especially feminist criticism. Even with the increase in feminist critiques of the methods and practices used in musicology and music education, there remains little room for the discussion of such critiques within music. The thread that unites diverse feminists in music, whether elementary school teachers or university lecturers, is the extreme isolation they have been known to experience. This research is an introduction to feminist methodologies and current studies on the subject, including a textual analysis of a textbook currently being used in Albion College's music education courses.

This research is intended to function as a potential tool for educators. Taking a feminist approach to textual analysis makes visible the way in which musical meaning and value can embody racist, classist, and sexist assumptions. In addition to textual analysis, I conducted participant observation in Albion Public Elementary Schools and Albion College music classes, to make visible the important issues which feminist music educators have identified. By meshing current research with interviews of faculty members and students, the presence of similar issues is shown to be existing here in Albion.

The title of this research is a call for an improvement in the amount of attention given to gender studies, particularly in music education. Furthermore, the title was inspired by one of the textbooks analyzed in this study, which covered the topic on merely two pages.

KIRK MYERS, '99

An Analysis of the Reconstruction and Development Programme's Impact on Housing in South Africa

Faculty Sponsor: 'Dimeji Togunde

Major: Political Science
Hometown: Millville, Minn.

Development literature has paid serious attention to housing, primarily because of its ability to alter a nation's social structure. Housing is also a dream of many citizens, and it represents a highly visible and measurable attainment of progress. With the burden of growing urban populations and continuing industrialization, many third-world countries deal with the task of providing equitable housing stock that allows access to jobs and services. Using South Africa as a case study, this study assesses the impact of the Reconstruction and Development Programme, formed in 1994 by the African National Congress, by focusing primarily on housing policy in the greater Cape Town area. Data from secondary sources including non-governmental organizations, public policy "think tanks," and studies from the University of Cape Town are examined to measure the effectiveness of the housing program. Findings indicate that the housing program was more failure than success for several reasons, including the government's inability to handle the scope of the program and indecisive actions about location, quantity, and quality. One major policy implication of this finding is that South Africa must continue to amend its efforts in housing provision to provide an equitable base for society and prevent further social stratification.



JAMES OTIS NELSON, '00

Supplemental Alkene Reactions for Sophomore Organic Lecture

Faculty Sponsor: Clifford Harris

Major: Biology
Hometown: Onkama, Mich.

Representative examples of several classes of simple organic alkene addition reactions have been collected from original sources. They are real-life examples from actual experiments spanning a broad history of organic chemistry and include information on yields, selectivity, and product distributions. As a whole they are intended for use by instructors seeking to supplement current undergraduate textbooks, which lack this kind of information. Instructors may find these useful to clarify and reinforce some basic concepts of reactions for their students. The associated references also serve as an excellent introduction to the chemical literature since the student is not immediately overwhelmed by unfamiliar concepts. This work represents our progress toward a complete collection of representative reactions.

MEGHAN PERKINS, '99

At-Risk: Functional Categorization or Attitudinal Justification

Faculty Sponsors: Leonard Berkey and Barbara Keyes

Majors: Psychology, Sociology
Hometown: Alma, Mich.

When you hear the term "at-risk," what does that mean to you? This term is widely used to refer to children, yet the definitions vary. To some people it means at-risk for diseases, and for others it means at-risk for failure and dropout. As a member of the Building Assets in Middle School Girls research team, I have been in close contact with many of these so-called "at-risk" children. Through mentoring and research, our team has evaluated certain stereotypes and beliefs associated with lower income girls who are "at-risk" for failure in school. However, the focus of my own

research has been to examine how these girls are viewed by teachers and by their peer groups. More specifically, I evaluated whether they were seen and treated differently from those children who are not labeled "at-risk." Questionnaires were given to teachers in the seventh and eighth grades, as well as a few special education teachers. The focus of the questionnaire was on the "at-risk" label itself, and what the term meant to teachers. Since there is a state definition of the term, I expected to find that this was how the teachers defined "at-risk." However, the findings were not what I expected. I also gave a similar, yet modified questionnaire to some of the girls participating in our program. While the verdict is still out with a few of the teachers and many of the girls, I expect to find that this label hinders these "at-risk" girls. With so many strikes against these children already, is it worth labeling them further? That is what I intend to research further.

MELISSA PETERSON, '00

The Female Experience and the Holocaust

Faculty Sponsor: Geoffrey Cocks

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

The female experience in the Holocaust differs greatly from that of men and, thus, deserves attention. Gender was not a part of Holocaust studies until recently, and the merit of focusing on it is still being debated. But, as in other areas of history, it is important to look at females' roles in determining how large a part gender played in their experiences. This study will expand the current research being done in this area. I will be looking at several representative categories of women. This study will look at Jewish women, lesbians, women in the Nazi party, and Catholic and Protestant women. There will also be a discussion of girls in each of these areas. For the first time, the study of the female experiences under the Third Reich will be compiled in a comparative study.

In Holocaust studies, there are usually three main groups in which all people are placed: victims, perpetrators, and bystanders. I will be looking at how women fit into these

categories, in addition to their roles in resistance. I will be engaging in the debates of victimization and collaboration and also on how these two areas are often interconnected.

MELISSA PETERSON, '00

(See also Jennifer Barr and Melissa Peterson)

JESSICA PYMAN, '99

Elegy for My Mothers

Faculty Sponsor: Lisa Chavez

Major: English
Hometown: Battle Creek, Mich.

The purpose of my project was to produce a sustainable piece of fiction which demonstrates a careful use of language as well as an overall improvement of my writing as a craft. These goals were achieved through the ongoing consultation, guidance, and editorial advice from my faculty advisor and readers.

This piece is about a middle-aged woman, Grace, who returns home after the death of her stepmother, the only mother she had ever known. Her father has already passed away, and so has the birth mother she had never met. The memories surrounding her are a constant reminder of what it means to have her parents and her birth mother gone. She feels as if these losses represent a complete loss of family. As Grace wonders what it would have been like to have met her birth mother, she also recognizes the complexities involved with loving the parents who raised her and gave her a home.

The section I will be presenting includes scenes with Grace sorting through items in the house as well as flashbacks to specific memories of her family. She also explores ways to cope with not having had any kind of relationship with her birth mother.

**AMY REIMANN, '00****Tile Restoration of the Green Lobby Floor of the Kingswood School for Girls, Cranbrook Educational Community, Bloomfield Hills, Michigan**

Faculty Sponsor: Lynne Chytilo

Major: Art History
Hometown: Albion, Mich.

This presentation documents the author's firsthand experience with the restoration of a ceramic tile floor in the Green Lobby, which is located in the Kingswood School for Girls on the Cranbrook campus. George Booth, founder of the Cranbrook Educational Community, contracted Eliel Saarinen to design the Kingswood School for Girls in 1929. This Prairie-style structure, one of Saarinen's preeminent accomplishments in architecture, is listed on the National Register of Historic Buildings. The project began with research on the original tiles: where they were made, the materials used, and the reason why the organization wished to replace them. Historical and architectural considerations were explored, and an attempt was made to improve the durability of the original tiles, which were over 60 years old. Tile production began in the summer of 1998 with the cutting, drying, and bisque firing of tiles and continued through the winter of 1999 with glaze firing. Methodologies of tile production are to be presented. Replacement of the tiles is scheduled to begin during the summer of 1999 and, once completed, the Green Lobby floor tiles should be more durable than the originals and enhance the appearance of the room.

REBECCA SALUS, '99**The Effects of Exercise on Leucine Metabolism in HIV+ Individuals: A Nutritional Study**

Faculty Sponsor: Robert Armstrong

Major: Chemistry
Hometown: Austintown, Ohio

Sarcopenia is a degenerative muscular disorder that can cause decreased physical and metabolic functions in the HIV+ individual. It has been reported that progressive resistance exercise training can slow the onset of sarcopenia in people infected with HIV, but the mechanisms behind this discovery are not clearly understood. Protein metabolism of HIV+ individuals was studied before and after a single bout of resistance exercise training. The subjects were given a constant infusion of ¹³C-labeled leucine and asked to perform an exercise task. Blood samples were obtained at time intervals ranging from 30 to 200 minutes post infusion. The plasma samples were derivatized and subsequently analyzed using GC/MS. Preliminary statistical analysis suggests that protein breakdown after exercise is enhanced in HIV+ individuals as compared to a healthy control group.

REBECCA SCHACK, '99**Gender and Racial Identity Salience: The Effects of Age, Race, Gender, and School Composition**

Faculty Sponsor: Ivelisse Martinez

Majors: Psychology, Anthropology
Hometown: Berkley, Mich.

A better understanding of the role of gender, race, and social context on the development of identity is important. Particularly absent from the literature in this area is research on the salience of gender and racial identity measured together. In an attempt to examine the issue of identity salience, pre-school, second grade, and ninth grade African-American and Caucasian students encompassed the sample. Each child was shown three sets of two pictures dependent on their

race and gender and asked, "Which picture is most like you?" For one set of pictures, the child chose between a same sex (as the child participant) but different race picture and a same sex, same race picture. A second set included two pictures of children of the same race as the child, but one a male and the other a female. The final set consisted of one picture of the same race but different sex as the participant and the other of a different race but same sex child. After the final set of pictures, two open-ended questions were asked: "Why did you choose this picture?" and "Why did you not choose this other picture?" Preliminary analysis of the data revealed that "gender" was consistently chosen over race in each grade although the answers to the final questions followed a pattern for each grade. These findings suggest that in racially diverse schools, race is not as salient of an identifier for children as gender.

BRADLEY SCHECK, '99**Albion College's New Strength and Conditioning Program: Does It Improve Title IX Compliance?**

Faculty Sponsor: Thomas Johnson

Major: Physical Education
Hometown: Milford, Mich.

During the 1997-98 school year only 39.2 percent of the athletes at Albion College were female. The year prior to that females made up 41 percent of the athletes on campus. There is one section of Title IX of the Education Amendments of 1972 with which Albion is not in compliance. Title IX states that the percentage of female athletes must be proportionate to that of its total enrollment. Albion's female percentage of enrollment for the 1996-97 and 1997-98 school years was 52.67 and 53.8 respectively.

The main purpose for this study was to see if offering a strength and conditioning program to female athletes will help their athletic teams achieve higher success, thereby achieving a greater recruiting base, and ultimately compliance toward the proportionality section of Title IX. There are three main methods researched in this study: (1) the results of the individual in the strength and conditioning program from last fall,



where pre- and post-test results are compared; (2) the performance of the teams who took part in the program compared with the results for the teams during the beginning of their seasons in comparison to previous years; (3) a survey of coaches of female athletes at the high school level to see what they believe influences their players in choosing a college.

ELISE SCHULTZ, '02

(See Gabrielle Bielak, Ray McMann, and Elise Schultz)

CAROLINE SCOTT, '00

How Do Children Develop the Concept of Representational Mathematics?

Faculty Sponsor: Reuben Rubio

Majors: Mathematics, Psychology
Hometown: Midland, Mich.

The purpose of this study is to gain further understanding of the processes by which young children develop abstract reasoning in mathematics (representational math). Psychological theory allows for two distinct styles of learning: a linear rate of progression, where children accumulate knowledge at various times, and a discontinuous rate of progression, where children learn in stages and mastery of previous steps is required for advancement. It is not known whether children must master specific mathematical skills in order to advance. Due to the nature of mathematics, I hypothesize that children will acquire mathematical concepts in stages. In order to test this hypothesis I plan to do a pilot study during the spring and summer semesters of 1999 using a battery of tasks that rely on an increasing level of abstract reasoning for each subsequent task. In the formal study, to be conducted in the fall of 1999, I will test boys and girls of various ages, socioeconomic levels, chronological ages, and racial backgrounds to test for significant differences between groups as well as general patterns for mastery of mathematical concepts. This study is

significant because it allows elementary teachers to apply developmental, educational, and cognitive psychology principles to mathematical teaching in the classroom, thus enhancing student learning.

BRANDON SELINSKY, '99

The Effects of Game Stress on the Immune Systems of Soccer Players

Faculty Sponsor: John Hostetler

Majors: Psychology, Philosophy
Hometown: Northville, Mich.

This study expands on a growing body of literature regarding the effects that stress may have on the immune system. Specifically, effects of game stress on the levels of immunoglobulin A (IgA) of soccer players were investigated. The 32 male and female players who participated in the study provided saliva samples for two separate trials: first at a period of low stress, to establish a baseline level, and then following a game, to evaluate the effect of the game. Results showed that while males generally felt less stressed than females [$F(1,30)=13.51$, $p<.001$], they also showed higher levels of IgA [$F(1,30)=5.67$, $p<.05$]. In addition, a major effect was found for time [$F(1)=22.91$, $p<.01$] as both stress and IgA levels tended to rise from trial one to trial two. Instead of decreasing after the game, as was hypothesized, IgA levels rose in both males and females; in fact, male IgA levels nearly doubled compared to the baseline, while female levels only increased slightly. And while perceived stress levels, too, rose more in males than in females, male levels stayed below female levels through both conditions. It is not clear whether the data represent a sex difference in stress perception or merely a difference in the individual games; therefore a battery of possible explanations is discussed, as well as the potential for future research and practical applications.

RYAN SHIREY, '99

Recovering James Hogg: Epistemology in *The Private Memoirs and Confessions of a Justified Sinner*

Faculty Sponsor: James Diedrick

Major: English
Hometown: Richmond, Ind.

Contemporary critical theory, particularly post-colonial theory, has helped reclaim the voices of peoples and cultures who have suffered at the hands of an imperialist agenda. While much post-colonialist criticism has concerned itself with third-world literature (African, Indian, and Caribbean literature in particular), the fundamental theory behind this orientation can be applied to European nations who were subsumed in what could be called the "first wave" of European imperialism. The nation of Scotland has had a most complex relationship with England for many hundreds of years, and it is my assertion that, particularly after the Union of 1707, many vital and important Scottish voices were muffled in the name of a growing and consuming "British" national identity.

James Hogg is the example par excellence of a major literary voice whose "Scottishness" earned him a marginal place in the canon of English literary romanticism. Although there has been an increasing interest in and appreciation of Hogg in recent years, his reputation marks him as little more than an important Scottish author. His great concern for his locale and the stories and legends of the Borders countryside do create a regionalist point of view in both Hogg's poetry and prose. However, his most acclaimed novel, *The Private Memoirs and Confessions of a Justified Sinner*, reveals that Hogg also made significant contributions to the development of the novel as an art form, and deserves recognition beyond the Scottish borders.

**JENNIFER SIMMONS, '99****Ultrasonic Repeller Effects on Flight and Reproduction of *Plodia interpunctella* (Lepidoptera: Pyralidae)**

Faculty Sponsor: Gwen Pearson

Major: Biology
Hometown: Lapeer, Mich.

Plodia interpunctella (Lepidoptera: Pyralidae), the Indian meal moth, is commonly found in grains and cereals of commercial warehouses and households. Because pest control is difficult in food products, attempts have been made to discover non-chemical pest control methods. A study was conducted to determine the effectiveness of the Transonic MR-50™, an ultrasonic moth repeller manufactured by Weitech Corp. (Sisters, OR). One portion of the study tested the Indian meal moths to determine how the moths behaved in the absence and presence of ultrasound and the repeller. Flight was seen more often in the moths exposed to the ultrasound ($df=1$; $X^2=57.9$; $p<0.0001$). While the frequency of flight and walking was significantly increased by the presence of ultrasound, the duration of time the moths walked did not seem to be altered. However, activity did not occur later in the flight trials suggesting that the moths became habituated to the ultrasound. The experimental moths also moved closer to the device than the control moths and called more often ($df=1$; $X^2=5.9$; $p=0.0155$ and $df=1$; $X^2=73.0$; $p<0.0001$ respectively). In the second portion of the study, colonies were set up to determine the effects of ultrasound on colony size. While the number of larvae present and the total population size were insignificant, the colonies exposed to the ultrasound did contain more adults ($F=12.544$; $p=0.002$). While Weitech Corp. claims their ultrasonic repeller is effective at preventing infestation by *P. interpunctella*, this study has shown the device to be unsuccessful.

JENNIFER SMITH, '99**The Effects of Leaf Removal, Cluster Height, and Wind Damage on Fruit Clusters of Two Bird-Dispersed Plants, *Rhus hirta* and *Rhus glabra***

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Scotts, Mich.

I examined the effects of three factors, leaf removal, height of fruit clusters, and wind damage, on fruit production and seed dispersal in two species of sumac, staghorn sumac (*Rhus hirta* [= *typhina*]) and smooth sumac (*Rhus glabra*). To examine the effects of leaf removal on fruit production, I experimentally removed leaves from some branches during the flowering period. In both species of sumac, leaf removal led to a significant decrease in fruit mass; in *R. hirta* 15 experimental clusters without leaves were 183.3 g lighter than control clusters with leaves, while the mass differential was 121.9 g for 68 clusters of the smaller *R. glabra*. These results indicate that energy for fruit production is derived from the new growth leaves rather than from a reserve in the trunk. I examined the effect of the height of clusters on bird dispersal by manipulating and reattaching clusters of *R. hirta* and *R. glabra* at different heights. In *R. hirta* the total fruit mass lost was greater among taller branches (29.4 g) than among lower branches (13.7 g), suggesting that birds are more likely to feed on clusters located on tall branches. I also examined the effects of cluster height and wind damage in *R. glabra* after clusters were apparently lost in a wind storm. I counted the number of fruits present and lost at different heights, and I found that a larger proportion of fruits was missing at lower heights (6.09 fruits missing for each fruit present) than at taller heights (1.28 missing for each present), suggesting that fruits located on the lower branches were more susceptible to wind damage or perhaps were more available to deer.

JOSEPH SMITH, '99**Computer-Aided Instruction of Linear Least Squares Fitting**

Faculty Sponsor: David Reimann

Majors: Mathematics, Computer Science
Hometown: Grand Rapids, Mich.

In an effort to more effectively teach students the concepts behind the least squares fit, a Web-based Java applet was developed. This applet allows mouse-based user input, which is then used to calculate the least squares fit line. The user can then look at the root mean square, correlation, x mean, y mean, and residuals. The user can manipulate individual points and dynamically update all computed statistics to enhance understanding and intuition. If the statistical quantities are unfamiliar to the user, then there is a section that explains the terms and their use. This project then delves into practical application and implementation in a classroom setting. Guided by framing questions, included on the page, we anticipate students working in pairs to explore and discuss key concepts of least square fitting.

JESSICA SUMNER, '99**The Women of Ravensbrück: A History of the Women's Concentration Camp**

Faculty Sponsor: Ingeborg Baumgartner

Majors: German, History
Hometown: Midland, Mich.

On the edge of Fürstenberg, a small city north of Berlin, Germany, are located the remnants of a concentration camp. This concentration camp is called Ravensbrück. Different from other camps, Ravensbrück was built specifically for women prisoners. Women from over 20 nations, including Russia, Poland, and Germany, as well as Jews, prisoners of war, and members of the opposition were interned here from 1938 to 1945. Over 120,000 women and children were forced through the gates of



Ravensbrück; 90,000 never returned home. They were subjected to inhumane conditions, daily abuse, slave labor, and medical experimentation. Many were executed.

The purpose of this thesis is to make known to a wide audience the fate of these women prisoners. Recounting the daily life of the prisoners and victims of Ravensbrück enabled me to understand more clearly the extreme conditions these women endured. By learning about their fate, we honor their suffering and keep their memory alive.

REBECCA SWISHER, '99

Adolescent Alcohol Consumption and Willingness to Participate in Drinking Behaviors

Faculty Sponsors: Leonard Berkey and Barbara Keyes

Major: Psychology
Hometown: Muskegon, Mich.

Risk-taking has become associated with normal adolescent development; however, such behavior, when taken to extremes, may be detrimental to young people's social, physical, and educational progress. Previous studies have examined factors influencing such risk behaviors as alcohol and drug use, sexual intercourse, and reckless driving, and while some findings are consistent, others conflict.

The current study attempted to evaluate a group of junior and senior high school students' alcohol consumption in relation to several variables that preceding investigations have found significant. To assess whether these components, including gender, grade in school, and quantity of risk-taking, corresponded to drinking behaviors, the researcher had eighth and twelfth grade students complete a four-page questionnaire. Queries related to demographics comprised the first portion of the questionnaire, and those pertaining to alcohol consumption followed.

Factor analysis was employed to reduce the number of variables. Tests of internal consistency for the nine factors produced Cronbach's alphas ranging from 0.52 to 0.88 with a mean of 0.75. Results of stepwise regression of the factors revealed that having

driven for a drinking driver, adult male caretaker's education level, and number of extracurricular activities explained 4.4%, 3.8%, and 3.6% of the variance in subjects' willingness to drive/ride after two or more drinks. Subject's sex, having ridden with a drinking driver, and approximate grade point average influenced 9.1%, 6.2%, and 4.4% of the variance in the factor of willingness to drive/ride after fewer than two drinks. Findings indicate that many variables influence adolescents' alcohol consumption and that schools would do well to develop programs aimed directly at those which influence their young people's perceptions about alcohol use.

JULIE VECCHIO, '99

The Contribution of Microphytobenthos to Estuarine Chlorophyll Concentrations

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Livonia, Mich.

At the base of estuaries, which are some of the most productive ecosystems on earth, reside microphytobenthos, single-celled, photosynthetic organisms that live in association with the sediment. Microphytobenthos may contribute significantly to the primary productivity of estuarine systems as well as keep the sediment from being resuspended.

In this study, we conducted extensive field and laboratory experiments on the microphytobenthos in Horn Point Cove, Md. In the laboratory, we measured the resuspension of microphytobenthos under controlled friction velocities (u^*). We found a logarithmic relationship between u^* and resuspension. We also found a linear relationship between sediment chlorophyll-a (chl) concentration and resuspended chl concentration. These data suggest a positive feedback loop at work in the system.

In the field, we conducted a two-week observational study of the microphytobenthos to determine whether microphytobenthos resuspension due to friction velocity could account for the variability of chl concentration found in the water column.

We found a strong correlation between total suspended solids and turbidity in the water column, but very little relationship between either of these parameters and water column chl concentration. These findings suggest that different forces drive the resuspension of sediment and the concentration of chl in the water column. Although the relationship between u^* and chl resuspension in the laboratory is strong, this relationship is very weak in a natural system.

RYAN WAGNER, '99

The Effects of Supplemental UV-B Radiation on Chlorophyll Concentration, Protein Concentration, and Taxon-Specific Assemblages within a Periphyton Community

Faculty Sponsor: Ruth Schmitter

Major: Biology
Hometown: Chelsea, Mich.

Increasing concern has been directed toward the depletion of ozone, which is allowing increasing amounts of UV-B (280-320 nm) radiation to reach the earth's surface. Increased UV-B radiation may negatively affect innumerable biological systems. Experiments were conducted to investigate the effects of supplemental UV-B radiation on periphyton algae. Periphyton were collected from Lake Winnipeg (42° 18. 45' N, 84° 48. 45' W) using microscope slides as a substratum for the self-adhesion of algal cells. Periphyton samples were irradiated with supplemental UV-B (280-320nm) and photosynthetically active radiation (400-700 nm). A Mylar filter was used to block UV-B (<320 nm) from one sample, while acetate was used to transmit 80% of UV-B and 100% of photosynthetically active radiation. A third sample received full UV-B and visible wavelengths of light. Reductions in chlorophylls a, b, and c were generally observed. Protein concentrations increased in periphyton irradiated with full UV-B. Further data on quantitative and qualitative effects of UV-B radiation on periphyton are provided.

**CLAIRE WALTON, '99****The Design Process of Arthur Miller's *A View from the Bridge***

Faculty Sponsor: J. Thomas Oosting

Majors: Theatre, Biology
Hometown: Plymouth, Mich.

Stage design is a collaborative process that requires both creative and technical insight to achieve an integration of literary themes and visual elements. A designer must have the freedom to explore concepts, while retaining some base in regards to the technical and physical limitations of the playing space. The process of designing often becomes an imaginative adventure in problem solving, which ultimately ends with an ingenious solution to the textual and physical demands.

When I was presented with the opportunity to design Arthur Miller's *A View from the Bridge*, I found myself having to solve many problems. In creating the Red Hook neighborhood that defines the world of *A View from the Bridge*, it was necessary to discover a solution that would allow for the episodic nature of the play to occur without any confusion. This was solved by employing two elevated, rotating units upon which most of the action was played, while leaving space on the stage deck in order to present the final climactic moment. The design for *A View from the Bridge* was very much a collaborative process between myself, the director, and the production team. It was only through the sharing of ideas that we arrived at a complete understanding of the underlying themes in order to create an expressionistic environment that supported textual aspects of the play. The process we worked through together helped us to create a cohesive and believable world of the play.

NADER WARRA, '99**Environmental Toxin Inhibits Human Immune System Activity: Effects of Mercuric Chloride on Human Neutrophils**

Faculty Sponsor: Robert Armstrong

Major: Chemistry
Hometown: Livonia, Mich.

In this study, I have tested the effects of mercuric chloride on the ability of neutrophils to bind and internalize foreign material. To assess the effects of HgCl_2 on human neutrophils, I studied the inhibition of normal neutrophil functions such as binding and internalization of foreign objects. IgG-opsonized sheep erythrocytes were introduced to normal and healthy neutrophils. The opsonized sheep erythrocytes were used to represent foreign particles like bacteria, viruses, and fungi that were invading the neutrophils environment. The experimental neutrophils were previously treated with various concentrations of mercuric chloride and then exposed to the IgG-opsonized sheep erythrocytes. The neutrophils were tested for their ability to both bind and internalize the IgG-opsonized sheep erythrocytes by using differential interference contrast (D.I.C.) and fluorescence microscopy. Both of these techniques showed a high number of bound and internalized IgG-sheep erythrocytes for the control neutrophils. In contrast, the mercury-treated neutrophils showed a significant decrease of binding and internalization of the IgG-sheep erythrocytes. This decrease in neutrophil function was dose dependent at 2.5, 5.0, and 10.0 mM HgCl_2 . These results show that mercury has a direct effect on the immunological responses of neutrophils. Thus, this study may also suggest that mercury interferes with the signal transduction that leads to the process of phagocytosis (internalization) performed by the neutrophils.

ERICKA WEBB, '99**Reading Language in the Fiction of Angela Carter**

Faculty Sponsor: Mary Collar

Major: English
Hometown: Pocatello, Idaho

Although the literary work of Angela Carter has produced much discussion about Carter's feminist politics and position in relation to postmodernism, the critical discourse has failed to produce a successful reading of Carter's work because that discourse has ignored Carter's philosophical interest in language. Several of Carter's short stories are primarily concerned with exploring the meaning of language and narrative. Carter's interest in language and narrative is closely connected to Derrida's idea of deconstruction but differs from it by valuing creation as much as play. Carter's linguistic program cannot be separated from her feminist politics or postmodern position. Ultimately, Carter is interested in using literary tools to expand the number of accepted possibilities for narrative structure. A language-sensitive reading of Carter's novel, *Nights at the Circus*, undermines many of the assumptions made about Carter's relationship to postmodernism and helps refine the critical understanding of Carter's feminist politics. A language-oriented approach to Carter reclaims the literary importance of her work.



ALLISON WOOD, '99

The Relationship between Immunoglobulin A Levels and Extremely High and Low Levels of Test Anxiety

Faculty Sponsor: John Hostetler

Majors: Biology, Psychology
Hometown: Holt, Mich.

The relationship between test anxiety and immunoglobulin A (IgA) was investigated in 27 students at a small, Midwest liberal arts college. Participants were chosen based on their responses to Spielberger's Test Attitude Inventory (1977) that was administered to the general population of (N=100) students. Thirteen students scoring high in test anxiety and 14 students scoring low in test anxiety were asked to continue with the study. It was hypothesized that as test anxiety increases, the level of IgA would also increase, followed by a decrease to below normal levels with the conclusion of the stressful event. It was further hypothesized that participants who evaluated themselves as having high levels of test anxiety would have a greater variation between IgA levels than subjects who evaluated themselves as having low levels of test anxiety. The saliva samples were analyzed at Midwest Regional Laboratory, and the results were analyzed using a 3x2x2 mixed design repeated measures ANOVA. An analysis revealed that there was not a significant relationship between test anxiety and IgA levels. Time, test anxiety, and sex were not found as a significant main effect or interaction effect for IgA. Sex ($F(1,19) = 7.29$; $p = 0.13$) and time ($F(2,77) = 57.10$; $p = .0001$) were found to form a significant main effect with stress. However, no interaction effects were found for stress. These results indicate that there is no relationship between salivary IgA and test anxiety levels.

KELLI ZAPPAS, '99

The Changing Nature of War: Cultural Conflict, Rape, and Genocide in the Balkans

Faculty Sponsor: Andrew Grossman

Major: Political Science
Hometown: Pittsburgh, Pa.

The end of the Cold War loosened controls over ethnic conflicts that for many years were suppressed. With the resurfacing of these conflicts, we see the extent to which groups will go to wipe out those they define as "others." In Bosnia, the Serbs used the Muslim women as a way to control, drive out, eradicate, and cleanse an ethnic group. The type of mentality that drove the Serb campaign is one that is unfamiliar to Americans—it is based in deep-rooted religious and ethnic hatred and involves groups that seem to have more common traits than they do different. The war in Bosnia epitomizes the post-Cold War trend toward wars of identity fought with unconventional means, wars embedded in hatred among groups of people, and wars that result in inexcusable and gross violations of human rights. These wars justify international action to prevent, end, and assign accountability for crimes against humanity and bring gender issues to the forefront of international discourse. The political rape of women is genocide and cannot be tolerated; it is dangerous to the world order to have such atrocious acts and violations of human rights occurring. The international community needs to determine ways to respond to this reemerging type of war; it needs to recognize that wars can be fought with mechanisms of control and acts of hatred. International law must be adapted to take into account these patterns of ethnic conflict and gender persecution and find ways to protect the lives and rights of those involved.



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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