



Illinois Wesleyan University Digital Commons @ IWU

John Wesley Powell Student Research
Conference

2004, 15th Annual JWP Conference

Apr 17th, 8:00 AM - 8:30 AM

Complete 2004 Program

Follow this and additional works at: <http://digitalcommons.iwu.edu/jwprc>

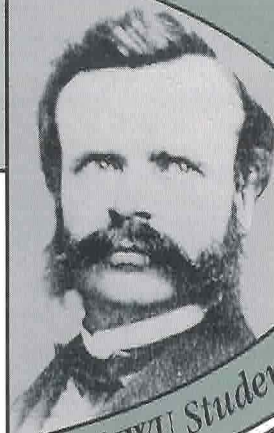
, "Complete 2004 Program" (April 17, 2004). *John Wesley Powell Student Research Conference*. Paper 1.
<http://digitalcommons.iwu.edu/jwprc/2004/schedule/1>

This Event is brought to you for free and open access by The Ames Library, the Andrew W. Mellon Center for Curricular and Faculty Development, the Office of the Provost and the Office of the President. It has been accepted for inclusion in Digital Commons @ IWU by the faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

THE FIFTEENTH ANNUAL

Illinois Wesleyan University
John Wesley Powell



2004

STUDENT
RESEARCH CONFERENCE

To Recognize the Research Projects & Creative Endeavors of IWU Students

CENTER FOR
NATURAL SCIENCES
SATURDAY
APRIL 17, 2004

<http://www.iwu.edu/jwprc>

The conference is named for explorer and geologist John Wesley Powell, a one-armed Civil War veteran and a founder of the National Geographic Society who joined Illinois Wesleyan University's faculty in 1865. He was the first U.S. professor to use field work to teach science. In 1867 Powell took Illinois Wesleyan students to Colorado's mountains, the first expedition of its kind in the history of American higher education. Later, Powell was the first director of the Smithsonian Institution's Bureau of Ethnology.



Illinois Wesleyan
UNIVERSITY

Fifteenth Annual

John Wesley Powell • IWU

Student Research Conference

Science Commons

Center for Natural Sciences

Saturday, April 17, 2004

8:30 a.m. - 6:00 p.m.

Official Program

ACKNOWLEDGEMENTS

This conference could not have been a success without the contributions of Ram Mohan, Mike Seeborg, Curtis Kelch and Pat Neustel.

The invaluable assistance provided by Mike Welsh and his staff at Sodexo-Campus services in setting up breakfast, luncheon and other refreshments is gratefully acknowledged.

The assistance provided by Patrick McLane of Information Technology in setting up computer equipment in all rooms is greatly appreciated.

SCHEDULE OF EVENTS

Saturday, April 17, 2004

8:30 a.m.	Continental Breakfast and Poster Setup	Science Commons
9:00 a.m.	Poster Session A	Science Commons
10:00 a.m.	Keynote Address: Martin Hulce	Anderson Auditorium (C101)
11:00 a.m.	Oral Presentations – Session I	
	Session 1	CNS C101
	Session 2	CNS C102
	Session 3	CNS E103
	Session 4	CNS E104
12:15 p.m.	Luncheon	Main Lounge
1:15 p.m.	Poster Session B	Science Commons
2:35 p.m.	Oral Presentations – Session II	
	Session 5	CNS C101
	Session 6	CNS C102
	Session 7	CNS E104
	Session 8	CNS E103
4:00 p.m.	Student Art Show and Reception	Merwin Gallery
5:15 p.m.	Music Student Presentations	Westbrook Auditorium

KEYNOTE SPEAKER

"THE BIG MAC ATTACK MESSAGE"

Professor Martin Hulce, Creighton University

10:00 a.m. Anderson Auditorium (C101)

Professor Martin Hulce received his B.S. in chemistry from Butler University in Indianapolis, Indiana in 1978. Graduate studies with Professor Gary H. Posner at the Johns Hopkins University in Baltimore, Maryland led to M.A. and Ph.D. degrees in organic chemistry in 1980 and 1983, respectively. After two years as a research chemist in the Agricultural Chemicals Department of E.I. du Pont de Nemours and Co., Inc. in Wilmington, Delaware, he joined the faculty of the University of Maryland, Baltimore County, as an Assistant Professor of Chemistry and Biochemistry. In 1991, he joined the faculty of Creighton University, in Omaha, Nebraska, where he is Professor of Chemistry and holds a secondary appointment in Creighton's School of Medicine as Professor of Biomedical Sciences. A recipient of the Robert F. Kennedy Memorial Student Award for Teaching Achievement, Professor Hulce is a divisional officer of the American Association for the Advancement of Science, and a member of the Nebraska Biomedical Research Infrastructure Network steering committee. He has published extensively in major chemistry and biomedical journals and his research, which spans a broad range from synthetic organic chemistry to medicinal chemistry, has been funded by several major competitive grants.

STUDENT PARTICIPANTS

Ranmali Abeyasinghe	P1	Kathleen Duis	O1.2
Megan Adams	O5.1	Rachel Eichelberger	P13
Roger Adamson	O6.1	Karen Fernandez	P55
Peter W. Anzalone	P2	Paul Finch	O1.3
Joshua N. Arnold	P3	Lindsay Fitzharris	P18
Amy K. Atwood	P4,P5,P6	Jason Forster	P19
Jordan T. Ault	O1.1	Mahi Garg	O4.1
Dan Barkmeier	P7	Tammy Graff	O3.2
Jennifer Bartlett	P8	Amber Hays	P6
Stacy Barton	P57	Patrick D. Hayes	P21
Sally Bell	P59	Chelsey D. Hillyer	P20
Michael Berry	P9	Maria T. Holsen	O8.3,P22
Christopher Berg	P29	Conor Howard	P23
Erin Bicek	O8.1	Jena Hudson	P24
Joseph B. Binder	P10	Will Irwin	O4.2
Russell Blogg	P27	Prakrit Jena	P56
Karen Boschen	P11	Amanda Johnson	P61
Amanda G. Bratton	P54	Robin Johnson	P24
Stephanie Brewer	P29	Andrew Kapral	O7.4
Scott M. Brombosz	P12	Olukayode Karunwi	P25
Robin Brusman	O2.2	Bethany Kesselring	P26
Trisha Bucholz	O6.2	Lisa Krapf	O2.3
Andrea Bulkley	O3.1	Lindsey Krueger	P11
NathanielBurkhart	P13	Kevin Latman	P27
Edson Burton III	P65	Eric Macauley	P47
Kimberlee Butler	P53	Molly Marker	P28
Amy Cadwallader	P27	Ryan McGuinness	O6.3
Jason Callard	P14	Jon Meade	P29
Amanda Conley	O5.3	Erin Milligan	P30
George T. Coontz	O4.3	Bridget Mudron	P20
Krista A. Coulter	P15	Erica D. Mugnaini	O2.3
Paul Curran	O5.4,P17	Gautham S. Narayan	P31
Anna Czipri	P16	Mai P. Nguyen	P32
Katie N. Davis	O8.2	Stacy L. Nielsen	O3.3
Deanna Deschler	O2.2	Jacob Norris	P33,P34
Jason Dulac	P14	Debo Olaosebikan	P35

STUDENT PARTICIPANTS

Shawn C. Oppegard	P36
Brett Parmenter	P37
Laura Pautz	P39
Katie E. Peterson	P38
Amanda Pike	P40
Katie Polak	P41
Didi I. Popova	O2.1
Megan Presnak	O7.1
Tracy Quinlan	O7.2
Sara Rahim	P42
Michelle Ralston	O5.2
Mialy Ramaroson	P24
Alison M. Redden	P43
Melissa Richard	P29
Amy Rohalla	P29
Brian J. Simonds	P44
Jill Skarvan	P45
Scott Smith	P46
Ryan Smith	P47
Russell C. Smith	P48
Amanda Solliday	P13
Jason Somogyi	P29
Divya Soni	P66
Kyle Stork	P49
Nick Tognoni	P63
Nikhil Vajaria	P29
Jennifer VanderZee	P55
John Van Fleet	P9,P47
Brian R. Wasik	P50
Katie Wehr	P66
Daniel P. Wetzal	P51
Erin L. White	P52
Mollie Whitehead	O7.3
Elizabeth A.G. Whitehill	P53
Mary Wier	P67

EXHIBITION HONORS
SCHOOL OF ART
Saturday, April 17, 2004, 4:00 p.m., Merwin Gallery

Student Presenters:

Colin Burke
Kristen Carstensen
Julie McEntyre
Margaret Désirée Mug
Michelle L. Wright
Sarah E. Walker

Refreshments will be served

MUSIC STUDENT PRESENTATIONS
Saturday, April 17, 5:15 p.m., Westbrook Auditorium

Fluctuate

Colin A. D. Borck '04

Prof. Amanda Legner, marimba

Prolatio

Zachary Hilbert '04

movement 1: farthest
movement 2: not as far
movement 3: closer

Amanda Fuerst, flute
Erik Swanson, guitar

Italian Music in Dakota

Megan Drevits '05

Katrina Tammen, flute
Jenna Kaferly, clarinet
Stephanie Lyon, percussion
Caroline Franz, violin
April Guthrie, violoncello
Margaret Wendt, mezzo-soprano
Edward Stevens, conductor

Through the soft evening air enwinding all,
Rocks, woods, fort, cannon, pacing sentries, endless wilds,
In dulcet streams, in flutes' and cornets' notes,
Electric, pensive, turbulent, artificial,
(Yet strangely fitting even here, meanings unknown before,
Subtler than ever, more harmony, as if born here, related here,
Not to the city's fresco'd rooms, not to the audience of the
opera house,
Sounds, echoes, wandering strains, as really here at home,
Sonnambula's innocent love, trios with Norma's anguish,
And thy ecstatic chorus Poliuto;)
Ray'd in the limpid yellow slanting sundown,
Music, Italian music in Dakota.

While Nature, sovereign of this gnarl'd realm,
Lurking in hidden barbaric grim recesses,
Acknowledging rapport however far remov'd,
(As some old root or soil of earth its last-born flower or fruit,)
Listens well pleas'd.

- Walt Whitman

Music Presentation

*FLUCTUATE – A GLIMPSE INTO THE
MINIMALIST CONCEPT*

Colin A.D. Borck and David Vayo*
School of Music, Illinois Wesleyan University

This piece reflects a number of compositional concepts created/utilized by some of the great composers of the latter part of the twentieth century. The piece is an example of minimalism though its use of numerous repeated rhythmic patterns and harmonic progressions. Slowly the piece moves from being strongly rhythmic to an almost free-meter section. The high point occurs when the main rhythmic idea comes back four different times, each following its own progression of meters to end in a full unity. From there, the piece slowly dwindles to almost complete silence.

Music Presentation

PROLATIO, DUET FOR FLUTE AND GUITAR

Zachary D. Hilbert and David Vayo*
School of Music, Illinois Wesleyan University

Prolatio is a duet for flute and guitar in three movements, composed between during August-October 2003. The premiere performances took place on March 6, 2004, performed by flutist Amanda Fuerst and guitarist Erik Swanson. The title is from the Latin, for 'a bringing to the front'. This title describes how nuance and complexity surfaces progressively throughout the three movements of the composition. The main melodic and harmonic ideas are based on the interval of the minor seventh and modified triad with both major and minor thirds. Complex rhythms propel the motion of the piece..

Music Presentation

ITALIAN MUSIC IN DAKOTA

Megan Drevits and David Vayo*
School of Music, Illinois Wesleyan University

“Italian Music In Dakota” is a composition for mezzo-soprano, flute, clarinet, violin, cello, and percussion. The text is taken from the Walt Whitman poem “Italian Music In Dakota,” and the piece incorporates the Native American spiritual tune titled “The Earth Only Endures.” The gradual replacement of this tune with a text that supports westward expansion is musically symbolic of one culture being taken over by another culture.

ORAL PRESENTATIONS - SESSION 1

11:00 – 12:00

ANDERSON AUDITORIUM (C101)

CHAIR: TRACY QUINLAN

- 1.1 Jordan Ault
Political Science
- 1.2 Kathleen Duis
Political Science
- 1.3 Paul Finch
Political Science

ORAL PRESENTATIONS - SESSION 2

11:00 – 12:00

BECKMAN AUDITORIUM (C102)

CHAIR: MARIA HOLSEN

- 2.1 Didi Popova
Russian Literature
- 2.2 Deanna Deschler and Robin Brusman
Hispanic Studies
- 2.3 Erica Mugnaini and Lisa Krapf
Hispanic Studies

ORAL PRESENTATIONS - SESSION 3

11:00 – 12:00

CNS E103

CHAIR: JASON CALLARD

- 3.1 Andrea Bulkley
Physics
- 3.2 Tammy Graff
Biology
- 3.3 Stacy Nielsen
Biology

ORAL PRESENTATIONS - SESSION 4

11:00 – 12:00

CNS E104

CHAIR: JAMES R. GLENN

- 4.1 Mahi Garg
Economics
- 4.2 Will Irwin
Economics
- 4.3 George Coontz
Economics/Business

ORAL PRESENTATIONS - SESSION 5

2:35 – 3:50

ANDERSON AUDITORIUM (C101)

CHAIR: GEORGE COONTZ

- 5.1 Megan Adams
Anthropology
- 5.2 Michelle Ralston
Anthropology
- 5.3 Amanda Conley
Psychology
- 5.4 Paul Curran
Psychology

ORAL PRESENTATIONS - SESSION 6

2:35 – 3:50

BECKMAN AUDITORIUM (C102)

CHAIR: NII AMAAH OFOSU AMAAH

- 6.1 Roger Adamson
History
- 6.2 Trisha Bucholz
History
- 6.3 Ryan McGuinness
History

ORAL PRESENTATIONS - SESSION 7

2:35 – 3:50

CNS E104

CHAIR: RANMALI ABEYASINGHE

- 7.1 Megan Presnak
 Political Science
- 7.2 Tracy Quinlan
 Political Science
- 7.3 Mollie Whitehead
 Political Science
- 7.4 Andrew Kapral
 Political Science

ORAL PRESENTATIONS - SESSION 8

2:35 – 3:50

CNS E103

CHAIR: ANNA MARIA ROMERO

- 8.1 Erin Bicek
 Nursing
- 8.2 Kate Davis
 Nursing
- 8.3 Maria Holsen
 Religion

Note: Student's name is underlined, faculty advisor designated with *

Presentations are 10-15 minutes in length. If time permits, there will be a question-and-answer period for all presenters following the final presentation.

Oral Presentation O1.1

THE EFFECT OF AN ILLINOIS WESLEYAN UNIVERSITY EDUCATION
ON POLITICAL IDEOLOGY

Jordan T. Ault and Tari Renner*
Department of Political Science, Illinois Wesleyan University

This project attempts to measure the change in students' political ideology during their undergraduate education at Illinois Wesleyan University using survey data collected from several hundred students over the last five years. The change in political ideology is correlated with students' gender, cumulative grade point average and major course of study in an attempt to determine the cause of political change in the university setting. In addition to the quantitative findings, the results of several faculty interviews will be presented in an attempt to determine how and why political socialization is taking place on campus.

Oral Presentation O1.2

**PLAYING BY THE RULES: EXAMINING THE
NON-COMPLIANCE OF EU MEMBER STATES REGARDING
ANTI-DISCRIMINATION LEGISLATION**

Kathleen Duis and Kathleen Montgomery*
Department of Political Science, Illinois Wesleyan University

Anti-discrimination policies and programs have come to the forefront in European Union social policy in the last five years. However, as national legislation shows, the individual member states are not equally complying with the policies that the European Union set forth in 2000. This paper examines and seeks to explain non-compliance of the member states through a test of two theories: the rational actor model and normative compliance model. The rational actor analysis suggests that states comply only when compliance will benefit the state either economically or socially. The normative analysis suggests that states comply when the legislation is in line with their national norms and values. This study finds that in order to begin to understand non-compliance a combination of the two should be used.

Oral Presentation O1.3

**POLITICAL CULTURE AND CHILD POVERTY: AN EXAMINATION OF
WESTERN AND POST-COMMUNIST EUROPEAN STATES**

Paul Finch and Kathleen Montgomery*
Department of Political Science, Illinois Wesleyan University

Although the European Union consists of advanced economies and has committed itself to the eradication of child poverty, variation in welfare policies as well as child poverty outcomes exists across Europe. The variation in child poverty and welfare regimes in the EU is about to increase with the entry of new members in the coming weeks. This presentation will examine political culture in relation to child poverty outcomes in Western European and post-communist Central and Eastern European (CEE) states. Research has shown that egalitarian attitudes towards redistribution are linked with lower rates of poverty. In addition to egalitarianism, this paper examines the relationship between gender roles and child poverty. The findings of this study indicate that support for feminist gender roles and an egalitarian distribution of wealth are related to lower child poverty outcomes. The situation in Eastern Europe, however, is complicated by a communist past that has left behind a political culture of egalitarian ideals of redistribution combined with a backlash of traditional values regarding gender roles.

Oral Presentation O2.1

THE THREE FAT MEN – POLITICS OF MAGIC

Didi I. Popova and Marina Balina*
Department of MCLL, Illinois Wesleyan University

Yury Olesha (1899-1960) was a prominent Soviet writer, who became famous in the 1920s with his novel *Envy*, his short stories and plays. His works represent innovative and non-conformist style for which he was later punished by the Soviet censorship by silence.

Among his earliest literary experiments is his fantasy for children *The Three Fat Men* written in 1924.

The violent years of the Civil War that followed the Socialist Revolution of 1917 were filled of contradictions and confusion of the new time. Olesha turns away from the depiction of violence and provides for both children and their parents a unique approach to the Revolution as a festivity with its exciting and vivid adventures. A study of Olesha's artistic imagination incorporated in his characters who go through unusual transformations in *The Three Fat Men* will be presented.

Oral Presentation O2.2

**NECESITO AYUDA MÉDICA: AN ANALYSIS OF PROFESSIONAL SPANISH
TRANSLATION SERVICES IN BLOOMINGTON-NORMAL HEALTHCARE**

Deanna Deschler, Robin Brusman and Christina Isabelli*
Department of Hispanic Studies, Illinois Wesleyan University

The demand for bilingual healthcare assistance in the United States grows along with the number of Hispanic immigrants (Davidson, 2000). Immigrants that lack English language skills and need medical treatment may discover a deficiency of the translation services offered. Miscommunication between doctor and patient may ensue, resulting in an inaccurate diagnosis. This case study attempts to examine the Spanish language services provided in Bloomington-Normal healthcare and the attitudes of providers and recipients concerning their experiences with the services. Regarding these services, interview responses from health care providers (two hospitals, a women's health organization and a local free clinic) are compared to a low-income Mexican immigrant family's personal experience. The family's accounts provide insight into the difficulties created by linguistic barriers in the healthcare setting, confirming the necessity for professional medical interpreters in Bloomington-Normal.

Davidson, Brad. 2000. The interpreter as institutional gatekeeper: The social-linguistic role of interpreters in Spanish-English medical discourse. *Journal of Sociolinguistics* 4; 379-405.

Oral Presentation O2.3

CUBAN IMMIGRATION IN THE U.S.

Erica D. Mugnaini, Lisa M. Krapf and Christina Isabelli*
Department of Hispanic Studies, Illinois Wesleyan University

This study investigates language attitudes of a Cuban community towards the use of Spanish in the United States. Through a detailed analysis of such influential agents as familial structure, level of education and socioeconomic factors, it is found that positive language attitudes have perpetuated the maintenance of the Spanish language within their community. These findings were gathered through a small case study by means of an extensive interview with a Cuban family residing in Chicago, Illinois. This study demonstrates the importance of language attitudes in the growth and maintenance of the Spanish language, and the survival and success of the Cuban community in the United States.

Oral Presentation O3.1

OPTICAL TRAPPING IN NOVEL GEOMETRIES

Andrea Bulkley, Jason Forster, Debo Olaosebikan and Gabriel C. Spalding*,
Department of Physics, Illinois Wesleyan University

Optical forces are being used in novel applications that span from cell sorting to studying the physical principles of DNA to alleviating the bottleneck in the internet. We describe the design and calibration of a flexible optical trapping set-up, which will allow us to compare the absolute magnitude of forces in conventional and non-conventional optical geometries. In particular, we discuss the interaction of micro-particles with conventional optical tweezers and with three-dimensional optical lattices.

Oral Presentation O3.2

**A COMPUTER SIMULATION TO EVALUATE DISPERSAL BY
CLONING (ASEXUAL REPRODUCTION) LARVAE OF
TROPICAL SEA STARS**

Tammy Graff and William Jaeckle*
Department of Biology, Illinois Wesleyan University

Larvae of some tropical sea stars are able to produce genetically identical individuals by asexual reproduction (cloning). Each “parental” larva has the potential to produce as many as 6 new individuals. Although cloning by larvae should increase the dispersal potential of each cohort of larvae (and their respective genomes), empirical evidence is absent. To assess the potential of sea star larvae originating off the African coast to be carried over prevailing ocean current (South Equatorial Current, SEC) to South America was studied through the development of a computer simulation. The simulation assumes an initial population size of 100,000 individuals from a single spawning event off the coast of Africa, which enter the SEC (11.3 cm / s) and are carried toward the east coast of South America, distance of 3788 km. Each individual (and subsequent offspring) was followed throughout its entire lifetime or until it reached South America. Although no individual larva that enters the SEC is predicted to travel the entire distance (complete development requires ca. 30 days), each individual’s genes may travel through successive generations of clones. The effect on instantaneous mortality rates and cloning frequency on the number of larvae that survive the complete dispersal to South America was assessed. This simulation will predict the conditions that must occur in order for cloning by larvae to have a significant influence on the potential for transatlantic dispersal.

Oral Presentation O3.3

PROTECTION FROM THE EFFECTS OF ULTRAVIOLET RADIATION
BY THE ENCAPSULATING STRUCTURES OF EMBRYOS OF
PHYSA SP., A FRESHWATER, PULMONATE SNAIL

Stacy L. Nielsen and Elizabeth Balser*
Department of Biology, Illinois Wesleyan University

The genus *Physa* includes freshwater pulmonate snails that inhabit shallow environments well within depths penetrated by ultraviolet (UV) radiation. The distribution patterns of egg masses of *Physa* sp. indicate that the snails lay egg masses in sunlit areas and the masses are attached to rocks and debris such as leaves and twigs. Each mass consists of a viscous jelly covering that encases a variable number of embryos. Each of the embryos is individually surrounded by an egg capsule. Field-collected masses had debris and epifaunal organisms attached to the jelly. Preliminary studies of the effect of UV radiation on the developing embryos of these snails indicated that embryos surrounded by the capsule and jelly coat experienced no detriment from UV exposure. However, removal of the jelly coat from encapsulated embryos and subsequent exposure to UV radiation resulted in a >90% mortality. The UV absorption of the jelly coat was measured in both laboratory-raised and field-collected egg masses using a UV-Vis spectrophotometer. Absorption of energy by the jelly covering was between the wavelengths of 275-300 nm. This is consistent with absorption of UV-B radiation. The fact that no difference was detected in absorbance between field and laboratory egg masses suggests that the jelly is providing protection, rather than any organism or material adhered to the egg jelly.

Oral Presentation O4.1

**WAGE DIFFERENTIALS FOR IMMIGRANT WOMEN IN THE
UNITED STATES: THE HEIGHTENED EFFECT OF GENDER
AND ETHNIC INTERACTION**

Mahi Garg and Michael Seeborg*
Department of Economics, Illinois Wesleyan University

The United States is one of only a handful of nations in which immigrant women outnumber immigrant men. These women come from increasingly diverse regions, thereby bringing considerably different skills to the U.S. workforce. However, the question of how gender and ethnicity interact with each other to affect the economic performance of female immigrants remains especially understudied. Thus, this paper aims at providing some insight into this formerly neglected dimension of female immigrant performance. It examines the sources of wage differentials between immigrant females, and other groups in the U.S. labor force, paying particular attention to earnings inequalities created by the interaction of gender and ethnicity. OLS regressions are used to carry out the analysis. A random sample of 100,000 immigrants and 50,000 natives is drawn from the 5% 2000 IPUMS data set. Their salary and wage income is regressed on several variables accounting for differences in human capital, gender and nationality, including interactions between gender and ethnicity. The results show that females and immigrants have relatively low wages because of their sex and country of birth. In addition, interactions between gender and ethnicity are found to be significant determinants of wages.

Oral Presentation O4.2

**RACIAL DISCRIMINATION IN MAJOR LEAGUE BASEBALL: CAN IT EXIST
WHEN PRODUCTIVITY IS CRYSTAL CLEAR?**

Will Irwin and Michael Seeborg*
Department of Economics, Illinois Wesleyan University

Minority workers in many industries have dealt with wage and hiring discrimination. In Major League Baseball, it is typically assumed that fair hiring practices are used and that fair wages are offered due to the intense negotiation process involved with each player contract. However, past research shows that both wage and hiring discrimination has been present during some recent time periods. With most industries, racial discrimination is difficult to measure due to the implicit bias in the productivity variables. However, in baseball, productivity can be easily measured with offensive and defensive performance statistics, which are determined completely independent of race. This paper attempts to use a human capital theory based regression and chi-squared analysis to determine whether or not racial wage and hiring discrimination is present in Major League Baseball. The key findings are that offensive production and games played are the determinants of salary, while race is not and that racial hiring discrimination is not present for the data used.

Oral Presentation O4.3

**MAKING INVESTMENT DECISIONS BASED ON PRIOR MERGER AND
ACQUISITION PERFORMANCE IN THE PREANNOUNCEMENT PERIOD**

George T. Coontz and J. Tim Query*

Department of Business Administration, Illinois Wesleyan University

Corporate mergers and acquisitions are very complex business transactions with a great deal at stake to the companies involved. To the individual investor, these transactions and how they are undertaken play a key role in investment decisions. Looking at the largest mergers (in dollars) since 1995, this study hopes to find consistent increases in shareholder wealth before announcement. This study hopes to find reliable data supporting financial and economic theories of increased shareholder wealth. This study will look at the pre announcement period to investigate if there are any signs in the market that would signal a time to invest.

Oral Presentation O5.1

**THE EFFECTS OF U.S. MIGRATION ON MIGRANTS OF
OAXACA, MEXICO UPON THEIR RETURN**

Megan Adams and Rebecca Gearhart*
Department of Sociology, Illinois Wesleyan University

Ninety percent of the Mexican population in the U.S. lives in only twelve states, Illinois being one of them. While migration can be beneficial for the migrant, the U.S., and Mexico, it is also an issue of concern because of the dangers involved in it. This research, conducted in the southwestern state of Oaxaca, Mexico in the fall of 2003, includes interviews of nine migrants who have spent time working in the U.S. and have now returned to their original communities. Some issues addressed include the reincorporation and readjustment of Oaxacan migrants after they return from time spent abroad, the effects of U.S. culture upon these migrants, the repercussions the North American Free Trade Agreement (NAFTA) has had on Oaxacan communities, and suggestions for solving the problematic phenomenon of migration from Mexico to the U.S.

Oral Presentation O5.2

**SOCIAL ORGANIZATION & DISORGANIZATION AMONG THE HADZABE:
THE DIVISION OF LABOR AND THE EFFECTS OF TOURISM ON A
HUNTING & GATHERING SOCIETY IN TANZANIA**

Michelle Ralston and Rebecca Gearhart*
Department of Sociology/Anthropology, Illinois Wesleyan University

This presentation is based on ethnographic research conducted among the Hadzabe of Tanzania in the Fall of 2003. The Hadzabe are the last hunting and gathering society in Tanzania, and for the past eighty years the Hadzabe have resisted outside pressures from the Tanzanian government to give up their traditional lifestyle. Ironically, rather than helping the Hadzabe protect their traditional ways, it is tourism that has initiated the degradation of the Hadzabe mode of production and culture. The Hadzabe division of labor, based on gender roles, has shifted, but that is not the only change that has negatively affected the Hadzabe. This research looks at Hadzabe society as a whole to better understand the impact that tourism and other aspects of globalization are having on Hadzabe life ways.

Oral Presentation O5.3

POSITIVE FEEDBACK ON APPEARANCE, VALUE PLACED ON APPEARANCE, AND NEED FOR APPROVAL: IMPLICATIONS FOR DISORDERED EATING BEHAVIOR AMONG UNDERGRADUATE FEMALES

Amanda Conley and Robert Lusk*
Department of Psychology, Illinois Wesleyan University

Negative feedback is often cited as a major contributor to unhealthy eating behavior among women. The present study examined whether positive feedback may also be associated with disordered eating behavior among women who place a high value on physical appearance. 109 female undergraduates at Illinois Wesleyan University completed surveys regarding positive appearance-related feedback received, value placed on physical appearance, need for approval, and eating attitudes. Preliminary analyses revealed that amount of positive appearance-related feedback and value placed on appearance were both found to be positively correlated with disordered eating behavior. Furthermore, body mass index was found to be negatively correlated with positive feedback received; in other words, females with a lower body mass received greater positive feedback. Implications for the relationship between positive appearance-related feedback and disordered eating behavior will be discussed. This is particularly important because it contradicts the traditional view that the feedback associated with disordered eating is negative.

Poster P17 and Oral Presentation O5.4

SOCIAL JUDGMENTS AND OBJECTIFICATION

Paul Curran and John Ernst*
Department of Psychology, Illinois Wesleyan University

Objectification involves treating individuals on the basis of their external rather than internal features. This study was aimed at the continued construction and development of an individual difference measure of men's objectification of women. Our measure was meant to quantify and define the idea of objectification. The first part of this study (Zolot, 2003), completed last year, created the initial item pool of 66 items and a four-factor structure for our measure. In this study we refined our measure based on last year's factor analysis, and added new items in order to extend and clarify these factors and test ideas about sexual objectification. We investigated the reliability of both the 41 items in our measure and the reliability of our measure over time with a sample of college-aged men. Although this analysis is not yet complete, our initial analysis shows our items to have a strong internal consistency ($\alpha=0.92$). Factor analysis and test-retest reliability have yet to be fully completed. The development of this measure will also be continued in the future with a test of construct validity.

Oral Presentation O6.2

**NEGRO BASEBALL LEAGUES AS THE CENTER OF
MIDWESTERN AFRICAN AMERICAN COMMUNITIES**

Trisha Bucholz and Paul Bushnell*
Department of History, Illinois Wesleyan University

The Negro Baseball leagues operated in the United States from 1898 until the late 1950's. These teams and leagues provided the black communities of the United States with a special type of entertainment. As black owned and operated franchises, the Negro league teams developed a sense of community among African Americans and provided many economic opportunities. This is particularly true during the years of the Great Depression. This talk will focus on how league organization provided financial stability for many and the East-West Classic all-star game allowed an outpouring of community support and served as a rallying point for the black communities, especially of the Midwest, throughout the years of the Depression.

Oral Presentation O6.3

THE OTHER MAGNIFICENT MILE: THE DEVELOPMENT OF HOWARD STREET AND ITS EFFECTS ON THE GROWTH OF THE ROGERS PARK NEIGHBORHOOD

Ryan McGuinness and April Schultz*
Department of History, Illinois Wesleyan University

Today, in the midst of Chicago's grand design of gentrification, one entering the northern border of the city from suburban Evanston will undoubtedly cross Howard Street. A part of the city that has recently been considered a North Side ghetto, the former Howard Street District is currently having enormous amounts of money being pumped into its Renaissance. It is now being promoted as Chicago's "Gateway," with new stores, new housing opportunities, new entertainment facilities, new mall complexes, and, most importantly, a new wealth. Yet, few realize that this is merely a redevelopment of a once lively and important area. In the time period between 1915 and 1955, Howard Street was one of Chicago's most vibrant "red-light" districts, as well as one of the most commercially powerful streets in the entire city. People came from all over the North Side and from the developing suburbs in an effort to enjoy this district's commercial opportunities and night-life. Sadly, however, there is a complete lack of scholarly literature looking back at Howard Street's development and its importance in the growth of Northern Chicago. As a result, using a plethora of newspapers and interviews from the Chicago Historical Society, as well as the Rogers Park Historical Society, my research paper is on the Howard Street District's importance to the development of the Rogers Park community, as well as its role as perhaps the single most important street on the entire North Side of Chicago in the years between 1915 and 1955.

Oral Presentation O7.1

**THE WORLD'S POLICEMAN TAKES A COFFEE BREAK
*THE CHANGE IN U.S. POLICY REGARDING PEACEKEEPING POLICY IN AFRICA***

Megan Presnak and William Munro*
Department of Political Science, Illinois Wesleyan University

Due to intrastate conflict in Africa, millions have suffered and died over the course of the past decade. During this time, it has been shown that intrastate conflict tends to spill over borders with the possibility of destabilizing entire regions and creating threats to the national security interests of the United States. Such conflict also tends to result in humanitarian crises, but since 1993 has not warranted military intervention by the United States. Since the military intervention in Somalia the United States has changed its policy regarding peacekeeping/peace enforcement in Africa from one of unilateral intervention and military cooperation with the United Nations to one where it can stand safely on the sidelines while conflict occurs. This change in policy is evident when looking at the United States' response to the outbreak of violence in Liberia in 2003.

The United States, instead of deploying armed forces directly to Liberia, withheld support while the humanitarian and security situations worsened within the country. This research explains how the Somali conflict serves as a justification to step back from African peacekeeping; it is merely an excuse to avoid direct involvement in an African conflict. Furthermore, this policy is detrimental to the United States' interests as well as to the people caught in conflict in African countries. The United States' policy regarding humanitarian intervention is driven by strategic, rather than moral, interests.

Oral Presentation O7.2

**LEVELING THE PLAYING FIELD: ELECTORAL THRESHOLDS
AND THE REPRESENTATION OF WOMEN**

Tracy Quinlan and Kathleen Montgomery*
Department of Political Science, Illinois Wesleyan University

There are large cross-national differences in the percentage of women in legislatures. Institutional arrangement is a considerable explanatory factor in the disparity in women's representation, and many mechanisms have been implemented to increase parity. Within PR systems, electoral systems are a way to try to increase the representation of women. Previous studies have linked thresholds to increased party magnitude and in turn to increased women's representation, but there have not been extensive studies to directly link thresholds to women's representation. This paper analyzes the impact of thresholds directly, finding that the relationship between thresholds and women's representation is not as strong or as direct as assumed within the previous literature.

Oral Presentation O7.3

**PROTECTING WOMEN FROM DOMESTIC VIOLENCE:
A COMPARATIVE PERSPECTIVE**

Mollie Whitehead and Kathleen Montgomery*
Department of Political Science, Illinois Wesleyan University

Domestic violence against women is a social problem that occurs in nearly every corner of the world. While policies and practices designed to protect women have emerged in a number of countries, many lag behind on the issue. This study examines the causal factors behind the variation in protection. The results of empirical analysis suggest that women's representation may be the most influential determinant of the level of protection women receive against domestic violence.

Oral Presentation O7.4

**THIRD-PARTY INTERVENTION IN INTRASTATE CONFLICT:
A COST BENEFIT ANALYSIS**

Andrew Kapral and Kathleen Montgomery*
Department of Political Science, Illinois Wesleyan University

Given the recent proliferation of intrastate conflict, the role of third-party intervention has become increasingly important to the peace and security of the international system. However, the escalation of violence often attributed to military forms of intervention may have severe costs for both the target of intervention and the state choosing to intervene. Past literature has focused on the effectiveness of such intervention without properly evaluating the reasons why a third-party chooses to commit military resources to such endeavors. This study will examine both the relative capabilities of the actors involved, and the stated reasons for intervention, in an attempt to discover what set of circumstances cause aggressive forms of intervention. Cost-benefit analysis is employed by third parties and is assumed to dictate the way in which intervention takes place. Ultimately, the material interests of the intervener seem to play a significant role in the decision to take aggressive action in a target state.

Oral Presentation O8.1

**NURSES' ATTITUDES, KNOWLEDGE, AND USE OF
NONPHARMACOLOGICAL PAIN MANAGEMENT TECHNIQUES
AND THERAPIES**

Erin Bicek and Sheila Jesek-Hale*
School of Nursing, Illinois Wesleyan University

Nonpharmacological pain management plays an integral role in the treatment of patient's pain, both in conjunction with pharmacological techniques and when used alone. Few studies exist that have examined this aspect of nursing care. There is a need for more research in this area. The purpose of this study is to randomly survey registered nurses at a local hospital to explore their attitudes, knowledge, and use of nonpharmacological pain management when caring for patients' in the hospital setting. Illinois Wesleyan University and the hospital have granted approval for this research. In order to participate, nurses will complete an informed consent, demographic questionnaire, and non-pharmacological methods questionnaire adapted from Tarja Polkki's instrument. The data will be analyzed using SPSS to find what factors such as age, unit of work, or years of practice might affect nurses use of nonpharmacological pain management. The data will also be analyzed to find out to what extent nurses use nonpharmacological therapies and which therapies they utilize.

Oral Presentation O8.2

**DETECTING SUICIDE RISK IN ADOLESCENTS AND ADULTS IN
AN EMERGENCY DEPARTMENT: A PILOT STUDY**

Katie N. Davis and Victoria N. Folse*
School of Nursing, Illinois Wesleyan University

Suicide is a serious health concern and was the cause of death of 29,350 Americans in 2000, making suicide the 11th leading cause of death for all Americans, and the 3rd leading cause of death for young people from 15-24 years of age (Gould, Greenberg, Velting, & Shaffer, 2003; National Center for Injury Prevention and Control, 2003). Furthermore, individuals who were over 65 years of age accounted for 18% of all suicide deaths in the United States (National Institute of Mental Health, 2003). The Emergency Department (ED) is an ideal setting in which to detect suicide risk; the most important intervention in the prevention of suicide in or following the ED visit is screening (Gould, et al., 2003). The purpose of this pilot study was to assess the incidence of reported suicide risk in adolescents and adults who presented to an Emergency Department. The convenience sample of 39 adolescents and 65 adults, who presented to the Emergency Department in March 2004, was asked to answer a four-item Risk Suicide Questionnaire ([RSQ] Horowitz, Wang, Gerald, Burr, Smith & Klavon, 2001). The reliability of the RSQ was evaluated using Cronbach's alpha, and criterion-related validity was determined by correlating responses from the RSQ with the post-evaluation diagnosis. The results and implications of this study will be presented.

References

- Gould, M.S., Greenberg, T., Velting, D.M., & Shaffer, D. (2003). Youth suicide risk and preventive interventions: a review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 386-405.
- Horowitz, L.M., Wang, P.S., Gerald, P., Burr, B.H., Smith, M.F., Klavon, S. et al. (2001). Detecting suicide risk in a pediatric emergency department: development of a brief screening tool. *Pediatrics*, 107, 1133-1137.
- National Center for Injury Prevention and Control. (2003). *Suicide in the United States*. Retrieved 1/4/2004 at: <http://www.cdc.gov/ncipc/factsheets/suifacts.htm>
- National Institute of Mental Health. (2003). *Older adults: Depression and suicide facts*. Washington DC: U.S. Department of Health and Human Services.

Oral Presentation O8.3

**THE POWERFUL SCHOLAR OF CULTURE: POST-STRUCTURAL
IMPLICATIONS, SELF-REFLEXIVITY AND
(EN)GENDERED SUBJECTIVITIES**

Maria T. Holsen and David R. Fryer*
Department of Religion, Illinois Wesleyan University

In evaluating the rigidity between objectivity and subjectivity in the social sciences, the problem of scholars' power position in representing societies' and individuals' identity dominates the debate. Using post-structural theory, this research analyzes Western feminist and self-reflexive methodology, concentrating on the tensions, inequalities, and contradictory narcissism that may surface in the attempt to textually conceptualize, critique, and communicate culture. In deconstructing Western academia's power sphere, I endorse a political slant in the academic, calling for scrutiny of "truth," an understanding of hegemonic undertones, and a further examination of native and subaltern voices and perspectives. As scholars attempt to holistically accommodate these viewpoints, post-structural theory assists in prioritizing the need to recognize, dissect, and assess scholars' own subjectivities and its (biased) effects on social science research.

POSTER SESSION A

9:00 - 10:00 a.m.

Odd-Numbered Posters

POSTER SESSION B

1:15 – 2:15 p.m.

Even-Numbered Posters

Note: Student's name is underlined, faculty advisor designated with *

During each poster session the author will be present to discuss her or his research with conference attendees, and answer questions.

Please remove your posters at 4:00 p.m.

Poster Presentation P1

**DEMOCRACY, POLITICAL STABILITY, AND DEVELOPING
COUNTRY GROWTH: THEORY AND EVIDENCE**

Ranmali Abeyasinghe and Michael Seeborg*
Department of Economics, Illinois Wesleyan University

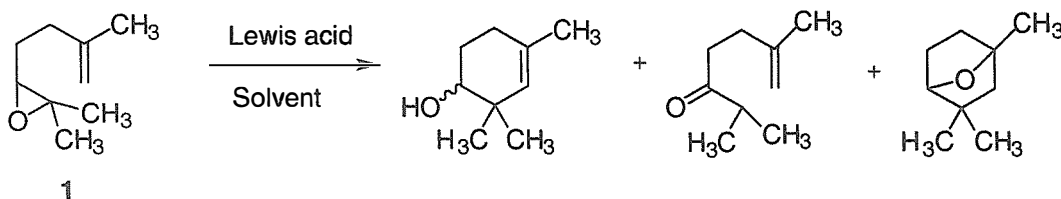
This research project examines the hypothesis that democracy and political stability have significant effects on the economic growth in developing countries vis-à-vis developed countries. Previous empirical studies find rather ambiguous results when testing for the relationship between democracy and growth. This paper extends these past studies by focusing on the effects of democracy and political stability in developing countries. It also attempts to differentiate the effects of political stability and democracy on economic growth. The results of this paper suggest that democracy does not have a significant impact on economic growth. Instead, the results suggest that political stability regardless of regime type has the greatest effects on a countries economic growth.

Poster Presentation P2

A STUDY OF OLEFIN-EPOXIDE CYCLIZATIONS CATALYZED BY METAL TRIFLATES

Peter W. Anzalone and Ram S. Mohan*
Department of Chemistry, Illinois Wesleyan University

An effective method for the synthesis of carbocyclic compounds is cyclization initiated by electrophilic ring-opening of polyene epoxides. These cyclizations occur rapidly in the presence of a variety of Lewis acids, such as TiCl_4 , and $\text{BF}_3 \cdot \text{Et}_2\text{O}$. The cyclization of geraniolene oxide **1** (easily obtained from commercially available geraniolene) catalyzed by a variety of metal triflates such as $\text{Bi}(\text{OTf})_3$, $\text{Sc}(\text{OTf})_3$ and $\text{Yb}(\text{OTf})_3$ will be investigated. The reaction of the saturated analog will also be investigated in the presence of various metal triflates. Preliminary results from this study will be presented.

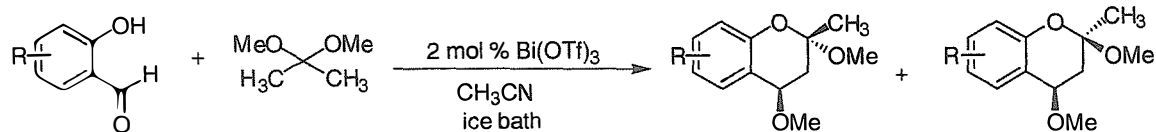


Poster Presentation P3

**BISMUTH COMPOUNDS IN ORGANIC SYNTHESIS: BISMUTH TRIFLATE
CATALYZED SYNTHESIS OF 2,4-DIMETHOXY-2-
METHYLDIHYDROBENZOPYRANS**

Joshua N. Arnold, Katherine E. Peterson and Ram S. Mohan*
Department of Chemistry, Illinois Wesleyan University

Dihydrobenzopyrans are obtained in good yields by treatment of a variety of salicylaldehydes with 2 mol % bismuth triflate and 3 equivalents of 2,2-dimethoxypropane in anhydrous CH₃CN. Bismuth compounds are attractive as reagents in organic synthesis because of their remarkably low toxicity and ease of handling. The effects of the solvent, temperature and catalyst on this reaction are being investigated. The results of this study will be presented.



Poster Presentation P4

**REDEFINING PARTICIPATION: TOWARDS THE UNDERSTANDING AND
CREATION OF AN INCLUSIVE DEFINITION**

Amy K. Atwood and David Hibbard*
Department of Psychology, Illinois Wesleyan University

Although a great deal of research has been conducted regarding class participation (e.g., Wade, 1994; Howard & Henney, 1998; Fritschner, 2000; Bean & Peterson, 1998), researchers have systematically disregarded those students who participate best through means other than vocal contribution to class discussion. This study examined student and professor definitions of participation and the impact of those definitions on student behavior in class. It was hoped that, by investigating alternate definitions of "participation" and its ability to be objectively graded in a classroom setting, a better understanding of the culture of participation would emerge. Professors were surveyed regarding if, why, and how they require participation in their classes. Students were surveyed regarding whether or not they believe making participation mandatory helps or hinders students. A primary focus was on student motivation to participate or not to participate. Both professors and students were asked to rate how likely they thought students would be to participate in hypothetical classroom situations. Quantitative and qualitative data were collected. It is hypothesized that (a) students will be shown to have different participation styles, (b) students will have broader definitions of participation than professors, and (c) students and professors will have different perceptions of student participation in selected situations.

Poster Presentation P5

**ATTITUDES AND INTENTIONS OF UNDERGRADUATES FOR FUTURE
ALUMNI ACTIVITY**

Amy K. Atwood and Fredrick B. Hoyt*
Department of Business Administration, Illinois Wesleyan University

“Students hear the word alumni and don’t relate. Their impressions of alumni associations are old, white-haired men driving big Cadillacs and having a lot of money” (Randall 2003). This common perception caused us to examine the attitudes and intentions of IWU students on their future alumni activity. The overall goal was to assist the IWU Alumni Office in developing a marketing and communications plan targeted at existing students. Information collected from preliminary focus groups helped in the creation of an attitudes and intentions survey given to 322 IWU students. Results from these questionnaires showed that students seemed knowledgeable about the fundraising needs of the university, but lacked sophistication about these needs. A targeted marketing campaign aimed at improving students’ level of sophistication shows great potential for altering the apathetic attitudes some students have about donating back to their alma mater. Due to the lack of relevant literature on the topic and the serious need for increased funds at all universities, these results may aid university management in increasing finances from alumni.

Poster Presentation P6

***DO WE STEREOTYPE?: CREATION OF THE CROSS-UNIVERSITY
STEREOTYPING SURVEY (CUSS)***

Amy K. Atwood, Amber Hays, and Linda Kunce*
Department of Psychology, Illinois Wesleyan University

A stereotype is a set of beliefs or expectations that people have about other people based solely on their group membership (Feldman 2001). Research shows that members of one population tend to hold favorable stereotypes toward their in-group members and unfavorable stereotypes toward members of the out-group. The everyday experience of college students at Illinois State University (ISU) and Illinois Wesleyan University (IWU) indicates that members of each university hold stereotypes about one another. The goal of this project was to develop a reliable and valid measure of the stereotypes IWU students hold about themselves *and* about ISU students. An initial item pool was developed using a combination of logical-content and empirical strategies. Empirical analyses revealed that items fell into four factors, or subscales, each with low to acceptable internal consistency as measured by Cronbach's alpha: Deviant (.70), Intelligent (.74), Dissatisfied (.76), and Elitist (.61). Results suggest that IWU students engage in stereotyping of both ISU and IWU students in that they report different beliefs or expectations about local college students based solely on their group membership. As would be expected, IWU students hold *more* favorable stereotypes regarding their in-group members (IWU students) and less favorable stereotypes regarding out-group members (ISU students).

Poster Presentation P7

**COMPARING THE NEUROTOXICITY OF THE CANCER
DRUGS CISPLATIN AND OXALIPLATIN**

Dan Barkmeier and Anthony Windebank*
Department of Biology, Illinois Wesleyan University
Department of Molecular Neuroscience, Mayo Clinic

Cisplatin is a platinum-based drug that has been used to successfully treat cancer since the 1970s, especially testicular and ovarian cancer. Cisplatin acts by binding to DNA and interfering with DNA replication, which most significantly affects rapidly dividing cells like cancer. However, the dosage that can be given to patients is limited by cisplatin's damage to the dorsal root ganglia, which are responsible for somatic sensory. A variety of similar platinum drugs have therefore been tested for less damaging neurotoxicity profiles. One of these compounds, oxaliplatin, was recently approved for treatment of colorectal cancer. Relatively little is known about its exact mechanism of action and neurotoxicity though. The goal of this project was to compare the neurotoxicity of cisplatin versus oxaliplatin and to further characterize the mechanism of oxaliplatin action. Results are not definite yet, but oxaliplatin causes apoptosis just like cisplatin, seems to cause less neuron cell death at equimolar concentrations, and both binds to and releases from neuron cell DNA more slowly than cisplatin.

Poster Presentation P8

ENCRUSTING ORGANISMS OF PUERTO PENASCO, MEXICO

Jennifer Bartlett and Susie Balser*
Department of Biology, Illinois Wesleyan University

An observational study was conducted to determine relationships and patterns of encrusting organisms and symbiotic sponge interactions. Common encrusting patterns were found between several species including the abundant coralline algae and the encrusting dominant *Geodia mesotriaena*. Abundance and dominance patterns of encrusting organisms were analyzed, however there is very little literature with which to compare the results. Several patterns including *G. mesotriaena* dominance and *Cliona* exclusiveness were observed. The relationship between sponge size and symbiotic invertebrate abundance was variable.

Poster Presentation P9

**MICROFLUIDIC DEVICE FABRICATION FOR OPTICAL
MICROMANIPULATION**

Michael Berry, Ryan Smith, John van Fleet, Jr., Brian Simonds, and Gabriel C. Spalding*
Department of Physics, Illinois Wesleyan University

Integrated "lab-on-a-chip" technologies require the development of miniaturized fluidic devices. We discuss fabrication, control, and performance issues pertinent to the use of microfluidic devices that incorporate optical sieves, for sorting and separating particles of varying size, shape, and molecular structure. The goal of this project is to improve the design of all-optical sorting devices and to address issues associated with microfluidic control. Towards that end, we will examine basic physical considerations appropriate to the microfluidic regime.

Poster Presentation P10

NITRITE PHOTOLYSIS IN 2-PROPANOL/WATER SOLUTION

Joseph B. Binder and Timothy R. Rettich*
Department of Chemistry, Illinois Wesleyan University

Nitrite ion has an important role in atmospheric chemistry because its photodecomposition is a source of hydroxyl radical, one of the most reactive oxidants of the atmosphere. In order to understand better the role of nitrite in the environment, free radicals produced by 366 nm irradiation of nitrite ion in 2-propanol/water solution were investigated. The 2-propanol served as a hydroxyl radical scavenger, reacting to form acetone. This product was quantified after conversion to a 2,4-DNP hydrazone, allowing both nitrite disappearance and hydroxyl radical production to be measured.

Poster Presentation P11

MATCHING-TO-SAMPLE WITH HORSES

Karen Boschen, Lindsey Krueger, Amy Attivissimo
and James Dougan*

Department of Psychology, Illinois Wesleyan University and Illinois State University

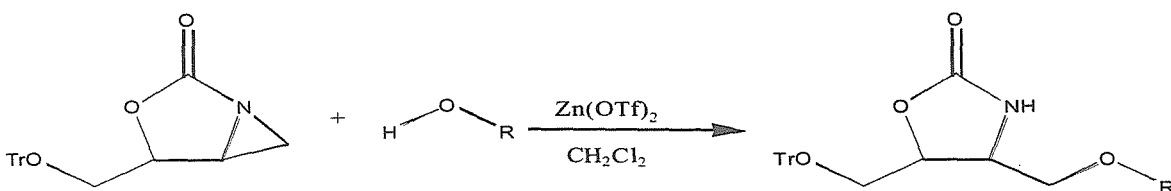
There has been little exploration in the area of horse cognition and depth perception. This study focused on five horses who were exposed to matching-to-sample tasks. First the horses were presented with a discrimination task between two-dimensional stimuli. Next, the horses were given the same task with three-dimensional objects. This was followed by a task combining the two-dimensional and three-dimensional stimuli. Results are presented in poster form.

Poster Presentation P12

ZINC TRIFLATE CATALYZED SYNTHESIS OF 4-SUBSTITUTED OXAZOLIDINONES

Scott M. Brombosz and Jeffrey Frick*
Department of Chemistry, Illinois Wesleyan University

Oxazolidinones are an interesting and relatively new class of antibiotics that have recently gained much attention for their effectiveness against certain drug resistant bacteria. The focus of this project has been to synthesize 4-substituted oxazolidinones from a bicyclic aziridine. This has been accomplished by utilizing a Lewis acid catalyzed ring opening reaction with various alcohols. The results from this study with primary and secondary alcohols will be presented.



Poster Presentation P13

**ORGANOCHLORINE PESTICIDE CONTAMINATION IN GRAY WOLVES
(*CANIS LUPUS*) AND NORTHERN WHITE CEDAR (*THUJA OCCIDENTALIS*)
FROM NORTHERN MINNESOTA**

Nathaniel Burkhart, Rachel Eichelberger, Amanda Solliday,
and Jeffrey Frick* and R. Given Harper*
Departments of Biology and Chemistry, Illinois Wesleyan University

Although some organochlorine (OC) pesticides have been banned in the U.S. for up to thirty years, they are still found in biota in North America. Other studies have found that OCs are deposited in North America from the atmosphere more heavily in the northern latitudes. However, no studies have been conducted that have documented OC pesticide contamination in wolves in North America, and few studies have looked for OCs in vegetation. We characterized the OC pesticide levels in gray wolves (*Canis lupus*) and Northern White Cedar (*Thuja occidentalis*) bark collected from northern Minnesota. Of the 17 OC pesticides and metabolites for which we surveyed, 14 compounds were documented in wolf kidneys. The four most prevalent compounds were p,p'-DDT (26/49 wolves), methoxychlor (21/49 wolves), α -BHC (19/49 wolves), and heptachlor (17/49 wolves). The minimum and maximum levels of the compounds were: p,p'-DDT 8.04-393.54 ng/g (i.e., parts per billion), methoxychlor 10.24-68.54 ng/g, α -BHC 9.67-109.68 ng/g, and heptachlor 7.52-149.16 ng/g. There was no significant effect of age, sex, or the interaction between age and sex on mean total OC levels. All six samples of the Northern White Cedar bark were contaminated. The four most prevalent compounds in bark were heptachlor (5/6 bark samples), p,p'-DDT (4/6 bark samples), methoxychlor (4/6 bark samples), and Heptachlor epoxide (4/6 bark samples). The minimum and maximum levels of the compounds were: heptachlor 40.0-1372.093 ng/g, p,p'-DDT 122.11-1596.90 ng/g, methoxychlor 124.726-537.65 ng/g, and heptachlor epoxide 25.26-120.35 ng/g.

This was the first study to document the presence of OC compounds in wolves from North America. It is interesting to note that p,p'-DDT is present in relatively high levels in both the wolves and tree bark. While DDT has been banned in the U.S. since 1972 because of its documented adverse effects on wildlife, it is still used in developing countries to fight malaria. Our data indicate that DDT and other OCs are persistent and are found even in areas where they were not directly applied. Future aspects of our study include analyzing white-tailed deer (*Odocoileus virginianus*), which are a major prey item of wolves, for the presence of OCs. If OCs are present in deer, we will determine if biomagnification has occurred in this food chain.

Poster Presentation P14

**ANALYSIS OF THE LARGE AMPLITUDE PENDULUM
AND THE EFFECTS OF DAMPING**

Jason Callard, Jason Dulac and William Brandon*
Department of Physics, Illinois Wesleyan University

We set out to study how a real pendulum oscillates about its equilibrium. Unlike the idealized pendulum, the period of oscillation is dependent upon the angle from which the pendulum is released and damps (decreases) with each oscillation. We found both period and damping to be dependent upon the angle from which the pendulum is released. In our case, the condition is accurately represented by Bernoulli's equation to the fourth order $T = 2\pi \sqrt{\frac{L}{g} \left(1 + \frac{1}{4} \sin^2 \frac{\theta}{2} + \frac{9}{64} \sin^4 \frac{\theta}{2} \right)}$, where L is the length to the center of mass and θ is the angle of release as measured from the perpendicular. Due to the variance in non-conservative forces, there is no explicit equation to apply to damping because all damping equations rely on measured constants. However, the extent of damping increased as θ increased, and we were able to depict damping for our particular pendulum.

Poster Presentation P15

**CLASSROOM STRUCTURE AS AN ENVIRONMENTAL EFFECT ON
CREATIVE PRODUCTION IN COLLEGE STUDENTS**

Krista A. Coulter and Gail E. Walton*
Department of Psychology, Illinois Wesleyan University

Research on creativity has been underrepresented in the field of psychology. A few previous studies suggest that instructional style affects the degree to which students express creativity. Past research indicates that less formal environments are related to increases in creativity as compared to formal environments. For example, formal (lecture) environments may inhibit the expression of creativity because there is no interaction between peers, creative ideas are rejected because they are not seen as the 'norm', and creative ideas are subjectively evaluated in a negative light and therefore, not allowed to develop. Informal (discussion) environments may foster creativity because individuals can interact, all ideas are accepted regardless of norms, and every idea is evaluated in a positive way, so nothing is seen as 'wrong'. Intermediate (lecture and discussion) environments are suggested to promote the most creative expression since students are given basic knowledge of the topic, yet are still able to tap into their creative resources because they are not yet limited by constraints of the area. This study set out to apply the three environments (formal, intermediate, and informal) in a university setting in order to expand the increasing research on creativity and enhance the educational system to further promote creativity. A total of 90 participants were given Sternberg & Lubart's (1995) creativity assessments before and after the session. The responses to the assessments were rated on the following criteria: novelty, appropriateness of topic choice, integration of diverse elements, technical goodness, aesthetic value, and effort- to determine overall creativity, the dependent variable, which was then examined across the three environments.

Poster Presentation P16

SIBLING RELATIONSHIP STUDY (REPLICATION)

Anna Czipri and Linda Kunce*

Department of Psychology, Illinois Wesleyan University

Although there are many positive outcomes of growing up with a sibling having a psychological or behavioral disorder, typical siblings can potentially experience harmful effects of managing and coping with the special demands and stresses of having a sibling with these kinds of difficulties. The college years are often a time to restructure sibling relationships. It is a time when young adults experience what it is like to be away from home for the first time, develop new groups of friends, and start new behavior patterns, attitudes, goals, and relationships that call for a more mature individual. The current study was designed to investigate psychosocial experiences of college students who have siblings with psychological and behavioral disorders as compared to college students who have typically developing siblings. A stress and coping model was used to examine cognitive appraisal, coping, and adaptational outcome. Using the data from approximately 250 students, 36 students who identified their siblings as having a psychological or developmental disorder and 36 students with typically developing siblings were identified. Analyses were conducted to test hypotheses about (a) group differences in sibling-related worries, adaptational outcome, and coping, and (b) associations among cognitive appraisal, coping and the outcome variables. This study provides more information on the experiences of college-aged siblings with respect to their sibling-related worries and coping styles, of which there is little research devoted to.

Poster P17 and Oral Presentation O5.4

SOCIAL JUDGMENTS AND OBJECTIFICATION

Paul Curran and John Ernst*
Department of Psychology, Illinois Wesleyan University

Objectification involves treating individuals on the basis of their external rather than internal features. This study was aimed at the continued construction and development of an individual difference measure of men's objectification of women. Our measure was meant to quantify and define the idea of objectification. The first part of this study (Zolot, 2003), completed last year, created the initial item pool of 66 items and a four-factor structure for our measure. In this study we refined our measure based on last year's factor analysis, and added new items in order to extend and clarify these factors and test ideas about sexual objectification. We investigated the reliability of both the 41 items in our measure and the reliability of our measure over time with a sample of college-aged men. Although this analysis is not yet complete, our initial analysis shows our items to have a strong internal consistency ($\alpha=0.92$). Factor analysis and test-retest reliability have yet to be fully completed. The development of this measure will also be continued in the future with a test of construct validity.

Poster Presentation P18

**MAGIC, MYSTICISM, AND MODERN MEDICINE: THE INFLUENCE OF
ALCHEMY IN SEVENTEENTH-CENTURY ENGLAND**

Lindsay Fitzharris and Michael Young*
Department of History, Illinois Wesleyan University

In 1947, historian George Sarton questioned the place of alchemy in the history of science. He was not unlike many historians, who even attacked scholars of the subject, characterizing them as “fabulous creatures” who “seem to be under the wrath of God themselves” and who “become tinctured with the kind of lunacy they set out to describe.” For decades, critics fought hard to keep alchemy out of the history of science. Instead, the emphasis of the Scientific Revolution centered on the mathematical sciences, focusing mainly on the intellectual move from Copernicus to Newton and highlighting astronomy and the studies of motion at the expense of the biological and chemical sciences. Moreover, many factors have led historians of science to underestimate the importance of alchemical and chemical philosophy in sixteenth- and seventeenth-century Europe. Recent evidence, however, shows that alchemy was just as vital to the development of modern medical practices as was Galenic medicine, which is commonly seen as the precursor to modern medicine by historians of science.

Still, recent efforts by historians of science have focused more on continental alchemy and not enough on English alchemy. Allen Debus, a historian at the University of Chicago, is one of few scholars to examine alchemical medicine in seventeenth-century England; however, he fails to discuss some of the most startling advancements made by English alchemists during this era. Specifically, Debus does not discuss alchemical treatments of the plague and venereal diseases in the seventeenth century. This presentation, however, will concentrate on those treatments and show how alchemy was, despite its traditional characterization, quite modern in its medical philosophy because of these new techniques.

Poster Presentation P19

CALIBRATING THE FORCES OF OPTICAL TWEEZERS

Jason Forster, Andrea Bulkley, Debo Olaosebikan and Gabriel C. Spalding*
Department of Physics, Illinois Wesleyan University

Optical Tweezers use laser light to trap micro- and nano-scale particles, typically suspended in solution. We describe a set-up that allows flexible creation of optical traps, simultaneous monitoring of particle positions, and measurement of the optical forces produced. Using a spatial light modulator (SLM) we create different trapping geometries. A quad-photodiode (QPD) and CCD camera allow for particle position detection. Analysis of data from these instruments lets us achieve a calibration of the optical forces.

Poster Presentation P20

**CIVIC ENGAGEMENT THROUGH SOCIAL ORGANIZATIONS IN
BLOOMINGTON-NORMAL, ILLINOIS**

Chelsey D. Hillyer, Bridget Mudron and Teodora Amoloza*
Department of Sociology, Illinois Wesleyan University

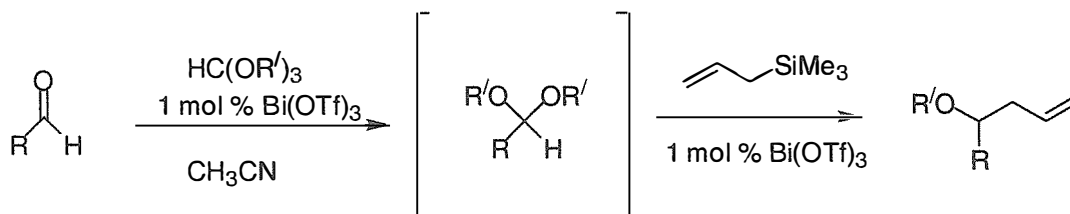
As American citizens, active participation in our communities is expected. Since Robert Putnam's (2000) study of community involvement through social organizations, researchers have begun to report and forecast a decrease in participation. Many attribute this decrease to simple disinterest. However, structural variables resulting from recent shifts in social norms and advances in technology, in addition to established cultural variables, have introduced new ways in which American citizens participate in their communities. By randomly sampling and surveying residents from Bloomington-Normal, Illinois, this research establishes that community involvement is prevalent. By testing with regard to established cultural variables, such as religiosity and community pride, and newly-evolved structural variables, such as parenting of school aged children enrolled in school and internet access, this research emerges as an exploratory, though not comprehensive, study of factors affecting community involvement through social organizations.

Poster Presentation P21

A ONE-POT METHOD FOR THE CONVERSION OF ALDEHYDES TO
HOMOALLYL ETHERS

Patrick D. Hayes, Pete W. Anzalone, Russell C. Smith, and Ram S. Mohan*
Department of Chemistry, Illinois Wesleyan University

A one-pot synthesis of homoallyl ethers from aldehydes has been developed using bismuth triflate as a catalyst. The procedure involves *in situ* generation of an acetal by treatment of the corresponding aldehyde with a trialkyl orthoformate followed by allylation with allyltrimethylsilane. Bismuth compounds are attractive as reagents in organic synthesis because of their remarkably low toxicity, low cost and ease of handling. The results of this study will be presented.



Poster Presentation P22

**REPRESENTING AFRICAN-AMERICAN STUDENTS AT IWU:
EXPLORATIONS IN VISUAL ANTHROPOLOGICAL METHODS**

Maria Holsen and *Rebecca Gearhart

Department of Sociology and Anthropology, Illinois Wesleyan University

Using the visual media of photography and collaborative ethnographic research methods, this poster presentation aims to facilitate discussion about issues that are important to the African-American student body at IWU. By examining the photographs taken during the ethnographer's participant-observation of activities commemorating Black History Month, the subjects conclude that they share a common cultural identity of being a minority group on a predominantly white campus. This research highlights the bond shared by African-American students that is cultivated by their rich common history, which they celebrate on and off campus with music and food. A common sentiment subjects convey is the conflict between seeking support among themselves and assimilating with the majority culture.

Poster Presentation P23

IS THERE ASSESSOR BIAS IN THE REAL ESTATE MARKET?

Conor Howard and Margaret Chapman*
Department of Economics, Illinois Wesleyan University

The purpose of this paper is to determine if the valuation of property adheres to the 33 1/3 proportion of market value required by the state of Illinois or if assessors are over-valuing Bloomington real estate disproportionately across high and low income neighborhoods. Assessors have a motivation to over-value high-income properties disproportionately resulting in intentional and systematic bias which inequitably alters the property tax system. The results support this idea by showing a higher percent variation between market and assessed values in high-income households. This implies that higher income households are paying a disproportionately higher property tax than low and moderate-income households.

Poster Presentation P24

**DESIGNING FNR MUTANT PROTEINS TO
PROBE CONFORMATIONAL CHANGES**

Jena Hudson, Mialy Ramarosan, Robin Johnson and Laura Moore*
Department of Chemistry, Illinois Wesleyan University

The goal of our research is to understand the conformational changes that take place as a transcriptional factor protein (FNR) goes from its inactive to active form. FNR is a protein found in facultatively anaerobic bacteria. It becomes active and dimerizes when oxygen is not present. This dimerization occurs after a 4Fe-4S cluster is assembled. The dimerized FNR binds to the DNA and activates the transcription of genes necessary for the anaerobic pathways. Since traditional methods of determining protein structure, such as x-ray crystallography or NMR spectroscopy, have not been successful with FNR, we will be using tryptophan fluorescence to better define the conformational changes. The wavelength of tryptophan fluorescence emission varies upon exposure to solvent and can be used to infer the change of position of an amino acid between aerobic and anaerobic states. As a first step, tryptophan residues were inserted at different amino acid locations along the dimerization helix and near the N-terminus. The FNR mutants R48W, L34W, R140W, Q141W, Q142W, M143W, M144W, S148W, G149W, K152W, G153W and G156W were created by site-directed mutagenesis, in the pET11a plasmid. Of these mutations, Q141W, M143W, M144W, G149W and E150W retained activity similar to the wild type protein. Wild type activity, for our purposes, is defined as at least 50% the activity of the unmutated protein. The retention of wild type activity is crucial to our study because only functional proteins, which are able to dimerize properly, will give insight regarding the actual conformational changes and structure of FNR. In an additional experiment, L146W, M147W and M157W were cloned into the pACYC184 plasmid in order to investigate dimerization of the mutant at FNR concentrations similar to the concentrations likely to be used for in-vitro experiments. Of the three, L146W and M157W retained wild type activity. Currently, we are attempting to purify the mutant proteins using column chromatography.

Poster Presentation P25

ADAPTIVE OPTICS FOR DYNAMIC OPTICAL TRAPS

Olukayode Karunwi, Ryan Smith and Gabriel Spalding*
Department of Physics, Illinois Wesleyan University

Holographic Optical Tweezers were first demonstrated by Fournier, *et al*¹, using a commercial hologram. A complete recipe for making *tailored*, planar arrays of optical traps using Diffractive Optical Elements (DOE) was laid out in the IWU – Univ. of Chicago collaboration, “Computer-Generated Holographic Optical Tweezer Arrays.”² While this original “HOT” recipe dealt with two-dimensional arrays, several generalizations have been demonstrated which extend the basic method to three-dimensions^{3, 4}. That said, three-dimensional studies remain in their infancy. Furthermore, even for lower-dimensional arrays, both errors in the DOE and aberrations in the optical system can compromise trap performance. We will report on our progress in using a Programmable Phase Modulator (an optically addressable DOE) to provide a reconfigurable, self-calibrating DOE, and to correct for aberrations. Our approach involves modifying the “HOT” algorithm in order to provide a feedback mechanism between the input optical array and output optical array.

- ¹ J.-M. R. Fournier, M. M. Burns, and J. A. Golovchenko, Proceedings SPIE — The International Society for Optical Engineering **2406**, 101 (1995).
- ² E. R. Dufresne, G. C. Spalding, M. T. Dearing, et al., Review of Scientific Instruments **72**, 1810 (2001).
- ³ H. Melville, G. F. Milne, G. C. Spalding, et al., Optics Express (2003).
- ⁴ J. Leach, G. Sinclair, P. Jordan, et al., Optics Express **12**, 220 (2004).

Poster Presentation P26

THE MECHANISMS OF NUTRIENT DISTRIBUTION IN PLUTEUS LARVAE
OF THE SEA URCHINS, *LYTECHINUS VARIEGATUS* AND *EUCIDARIS*
TRIBULOIDES

Bethany Kesselring and William B. Jaeckle*
Department of Biology, Illinois Wesleyan University

In the larvae of the sea urchins, *Lytechinus variegatus* and *Eucidaris tribuloides*, neither the body spaces (coeloms) nor the skin (ectoderm) is directly connected to the digestive system. As there are no specific blood "vessels" in these larvae, the entire body cavity represents a circulation system. Nutrients to be delivered to these tissues must move through the body cavity from the stomach and intestine, which are the primary sites for nutrient assimilation. The motive force for material flow through the body cavity may be the cilia of a "kidney" apparatus, a derivative of the left axocoel (coelom).

This kidney function involves the pore canal-hydropore complex, a fenestrated epithelium containing podocytes. There is also unidirectional trafficking of coelomic fluid out of the hydropore, which is analogous to metanephridia in the adult sea urchin (Ruppert and Balser 1986).

Larvae were incubated in a seawater solution of the iron-containing protein, ferritin, and the carbohydrate (polysaccharide), iron dextran. Samples of larvae were taken every 3 hours over a 24-hour period and then preserved in formalin. The spatial distribution of ferritin and iron dextran within larval bodies was determined using the "Prussian Blue" reaction. The absence of the blue label would be indicative of either an absence of nutrients within the body cavity or an inability of these cells to absorb the macromolecules.

The presence of label in both the cells of the axocoel and pore canal-hydropore complex suggested kidney-like functioning, via a pore canal structure that extends from the left axocoel to the outside of the larval body. Both areas contained blue label while all other coeloms were unlabeled. Also, label was detected at the basal side of the cells of the epithelium, implying there was movement through the blastocoel.

Poster Presentation P27

**A LATITUDINAL GRADIENT OF ORGANOCHLORINE PESTICIDE
CONTAMINATION IN RESIDENT NORTH AMERICAN SONGBIRDS**

Kevin Latman, Amy Cadwallader, Russell Blogg, Jeffrey Horvath,
R. Given Harper*, and Jeffrey Frick*
Department of Biology, Illinois Wesleyan University
Department of Chemistry, Illinois Wesleyan University

Organochlorine pesticides (OCs) are still found in the environment today, despite the fact that some have been banned for more than thirty years. Few studies have analyzed resident North American birds for the presence of OCs. We looked for patterns of OC contamination in resident North American passerines (songbirds) in relation to latitude and diet. Other studies have found OCs most heavily deposited at northern latitudes, due to global fractionation, a process by which airborne pesticides travel via certain weather conditions, and tend to migrate from warmer to colder regions. As such, we predicted that resident North American birds that bred in northern latitudes would contain higher levels of OC contamination than resident birds that bred in more southern latitudes.

Sixteen species of North American resident passerines were analyzed for the presence of 17 organochlorine (OC) pesticides and metabolites. All birds were collected in McLean County, IL between 1989 and 2004. Fifty-one of the 53 birds contained one or more OC compounds above detection limits. Up to eleven different pesticides were detected in a single specimen. Total detected pesticide levels ranged from 7.47 ng/g (i.e. parts per billion) to 2274.23 ng/g in a single specimen. The most prevalent OCs detected were p,p'-DDE (in 29 of the 53 birds), dieldrin (27 birds), heptachlor epoxide (22 birds), and p,p'-DDT (20 birds).

Overall mean levels of contamination were higher in insectivores (515.19 – 129.10 ng/g, mean – SE) than in omnivores (400.92 – 106.94 ng/g) and granivores (i.e., seed eaters) (97.30 – 38.12 ng/g). However, sample sizes were insufficient for statistical analysis. A significantly higher level of OC contamination was found in birds that bred north of Illinois and wintered in Illinois than in year-round Illinois residents, which supported our prediction.

Poster Presentation P28

**FUNCTIONALITY OF FNR PROTEINS WITH MUTATIONS IN THE FE-S
BINDING DOMAIN**

Molly Marker and Laura Moore*
Department of Biology, Illinois Wesleyan University

The FNR protein is an oxygen sensing transcription factor found in *Escherichia coli*. The binding of wildtype FNR to DNA is facilitated by the presence of a 4Fe-4S cluster, which functions to dimerize the protein. Entry of oxygen into the cell destroys the 4Fe-4S cluster and causes a conformational change in the protein, which then impedes dimerization. It is not understood how or why oxygen destroys the 4Fe-4S cluster. However, it is known that a leucine to histidine mutation at position 28 retains a stable 4Fe-4S cluster in the presence of oxygen. The properties of the amino acid residues (charge, size) surrounding the Fe-S cluster are important when considering its stability. The four cysteine amino acids found at positions 20, 23, 29 and 122 in the coding sequence of FNR ligand the four iron molecules in the cluster. We have investigated the importance of particular residues near these cysteine ligands. Our anaerobic cultures show decreased activity of FNR in alanine and aspartate mutants compared to histidine and lysine mutants at position 28. Aerobic studies are currently being conducted.

Poster Presentation P29

**THETA RESET IN HUMAN SUBJECTS DURING WORKING MEMORY
PERFORMANCE**

Jon Meade, Amy Rohalla, Chris Berg, Stephanie M. Brewer, Melissa Richard, Jason Somogyi, Nikhil Vajaria and Joseph Williams*

The theta wave has been implicated in memory formation and retrieval in rats. More specifically, a phase shift of the theta wave at stimulus onset (theta reset) has been linked to memory performance. The present study examines the role of theta reset in human subjects during working memory performance. EEG data was recorded during a working memory task that asked participants to view an array of dots and later recall the pattern. Preliminary data indicates that significant frontal midline reset occurred during the encoding phase of the task and was a predictor of better task performance. Preliminary data from non-midline theta indicates significant theta reset also occurred and was also predictive of greater task performance.

Poster Presentation P30

**INTERVENTION ACROSS THE ZOO DAY: ENVIRONMENTAL
ENRICHMENT IN MALAYSIAN SUN BEARS**

Erin Milligan and James D. Dougan*
Department of Psychology, Illinois Wesleyan University

It has become increasingly important to provide enriched environments for captive wild animals. Research suggests that enriched environments may reduce unwanted behavior (i.e., repetitive pacing). The present experiment reports on an ongoing program of environmental enrichment for Malaysian Sun Bears. During baseline sessions, data were collected across the 7-hour zoo day using a set of fourteen behavioral categories. Included in the fourteen categories were several types of repetitive, stereotypical behaviors identified in earlier studies. During intervention sessions, a set of foraging tubes were hidden in the bears enclosure, each containing a variable amount of a food item. The task required the bears to locate and open the tubes before consuming the contents. Previous studies in the zoo environment have shown the foraging tubes to be an effective means of reducing inappropriate behavior. In the present study, tubes were introduced at 2 p.m. in the afternoon, allowing assessment of the affects of using a particular intervention time. This research will lend information on the optimal time for tube placement within the zoo day. The results have implications for the study of captive Sun Bears, as well as for zoo animals in general.

Poster Presentation P31

**PHOTOMETRY OF THE ASTEROID-LIKE COMET P/LINEAR 34 AND
OUTER-BELT ASTEROIDS**

Gautham S. Narayan and Linda M. French*
Department of Physics, Illinois Wesleyan University

We present the first results from multiwavelength observations of the nucleus of the unusual Comet P/LINEAR 34. Formerly classified as asteroid 2002 CE10, observations by the Japanese Subaru telescope determined that it had a characteristic tail. We observed the object in visible, near-IR, and mid-IR wavelengths using the 0.9-m telescope at Cerro-Tololo Inter-American Observatory (CTIO) during October 2003. In addition, we observed Asteroids 2067 Aksnes, 2363 Cebriones, 15231 Ehdita and 279 Thule. We hope to determine the rotation period and constrain the shape of the objects.

Poster Presentation P32

**BCHC CATALYZED BACTERIOCHLOROPHYLL BIOSYNTHETIC
PATHWAY IN *RHODOBACTER CAPSULATUS***

Mai P. Nguyen and David W. Bollivar*
Department of Biology, Illinois Wesleyan University

Photosynthetic organisms convert light into energy by utilizing chlorophyll or bacteriochlorophyll to absorb the light and with the assistance of proteins make ATP as the main substance. In *Rhodobacter capsulatus*, the biosynthetic pathway of bacteriochlorophyll involves a variety of enzymes, each enzyme functions in a specific biochemical step. One of the enzymes catalyzes the reaction converting the intermediate 3-hydroxyethylchlorophyllide into 3-acetylchlorophyllide. One gene has been identified as being responsible for coding the enzyme that performs this reaction, *bchC*. This gene sequence codes for the protein BchC. In the experiments described in this poster the *bchC* gene has been isolated from *Rhodobacter capsulatus* and cloned into the bacterium *E.coli*. The protein has been expressed at high level by the bacteria and extracted for the purpose of study. The study of BchC is now focused in constructing an environment that allows the enzyme to be most efficient and the activity detectable.

Poster Presentation P33

**THE EFFECTS OF DISRUPTIVE EVENTS & RESPONSE COST ON TIME-
PLACE LEARNING IN RATS**

Jacob Norris and James D. Dougan*
Department of Psychology, Illinois Wesleyan University

Traditional behavior analysis has long emphasized the relationship between responding and local reinforcement effects. This is typified by testing animals in a constrained environment (the operant chamber) for during brief sessions. With some notable exceptions, relatively little research has examined reinforcement effects in larger, more open environments across longer time intervals. The present experiment examines time-place learning, in which reinforcement is available in certain locations only during certain times of an experimental session. Rats were trained to press bars for food reinforcement in a large, open environment with two different feeding stations (half trained in a low response-cost condition, the other half in a higher response-cost condition). At any one time, only one feeding station was operative, with time of the session, the only cue signaling which station was active. During baseline, rats learned to visit the appropriate station based on the time of session. They were then exposed to “disruptive” event to determine how the disruption would alter their time-place responding. Additionally, the impact of response-cost upon ability was assessed. The results have implications for theories of timing as well as for theories of operant behavior. The results may also have implications for how experiments are to be properly conducted.

Poster Presentation P34

INTERPLAY BETWEEN SOCIAL COGNITION, TOOL USE, LANGUAGE DEVELOPMENT, AND NEURONAL PLASTICITY AS AN AVENUE FOR THE DEVELOPMENT OF THE HUMAN BRAIN

Jacob Norris and Charles Springwood*
Department of Anthropology, Illinois Wesleyan University

The Human brain is a versatile, dynamic “structure” that is the product of natural selection pressures that are becoming well understood. More specifically, a prime selective pressure that governed the development of the human brain was the sensitivity to social situations that gave rise to a theory of mind, defined as, “The ability to self-reflect and think about the mental states of others. ... This is a trait considered unique to the human species,” (Gazzaniga, Ivry, Mangun, 2002). The evolved ability to predict what others understand, and behave in situations, co-evolved with factors such as fine motor control and language development to produce a social and technological situation that further promoted the evolution of the Human Brain. The brain evolution was therefore a product of “runaway” selection, or a positive feedback loop; governed and facilitated by the rules of neuronal plasticity. Therefore, the Human brain is a product of itself, transforming itself through interactions with the environment that it creates. This has led some authors, such as Ehrlich to argue that humans are one of the few species that acts as its own trainer (2000). The current research will summarize the applicable neuroscientific, anthropological, and psychological literature and debate the merits of such an argument..

Poster Presentation P35

**STUDYING THE DYNAMICS OF MICRON-SIZED PARTICLES IN
OPTICAL TRAPS**

Debo Olaosebikan, Jason Forster, Andrea Bulkley and Gabriel C. Spalding*
Department of Physics, Illinois Wesleyan University

Optical Tweezers utilize dipole forces to *overcome* both gravity and the radiation pressure exerted by coherent laser light. Coherence is not important for conventional optical tweezers, but plays an important role in the interferometric approaches to optical trapping that we are exploring. Moreover, the role played by radiation pressure (backward scattering) is not always deleterious, and must be treated carefully. Random, thermal (Brownian) forces have a strong influence upon micro-scale particles, as does hydrodynamics.

We will discuss modeling of the interaction with simple (spherical) particles with a 3D optical lattice, and the details of experimental design offering calibrated sensitivities at the picoNewton level. Such resolution is of great significance in the study of molecular motors and in unraveling properties of DNA. Key technologies detailed in this presentation include quad-photodiode for high-bandwidth detection of forward-scattered light, and acousto-optic deflectors for generation of time-shared traps generated from a single beam.

Poster Presentation P36

**PHOTOMETRIC ANALYSIS OF TWO HILDA ASTEROIDS; 3202 GRAFF
AND 4317 GARIBALDI**

Shawn C. Oppegard and Linda M. French*
Department of Physics, Illinois Wesleyan University

Asteroids *4317 Garibaldi* and *3202 Graff* were studied on two nights each March 17-20, 2004, on the 42" Hall Cassegrain telescope at Lowell Observatory. Previous observations have been made for 4317 at the Calar Alto 1.2m observatory in 1994 (Dahlgren *et al*, 1999). However, a quality code of only 1, indicating minimal knowledge of the asteroid's rotation period, prompted further observation. 3202 was not observed by Dahlgren *et al* in their study of *Hilda* asteroids and was not found elsewhere in the literature. Thus, little is known of 3202 beyond its orbital parameters. Photometric data were taken to yield rotational periods as well as limits to the shape of the objects. Results of the IRAF-reduced images and their subsequent photometric analysis will be presented at the conference. Support from the provost of Illinois Wesleyan University and an IWU Artistic and Scholarly Development Grant is gratefully acknowledged.

Poster Presentation P37

A NOVEL METHOD FOR SUPER-RESOLUTION OPTICAL MICROSCOPY

Brett Parmenter and Gabriel C. Spalding*
Department of Physics, Illinois Wesleyan University
Department of Physics, Northwestern University

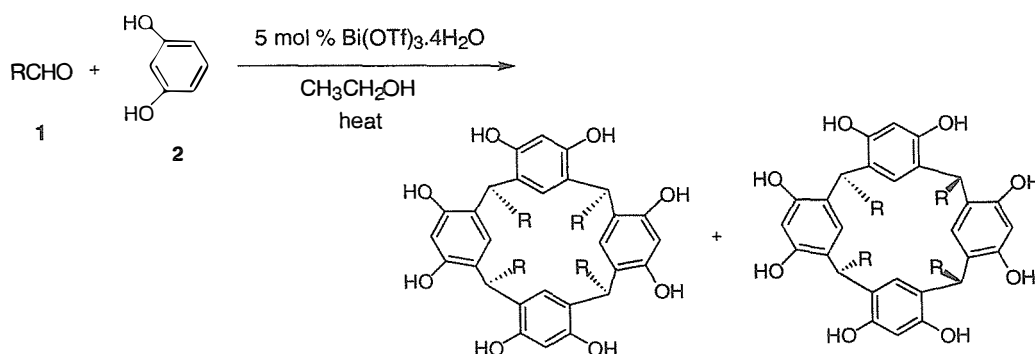
Even neglecting aberrations, conventional optical microscopes are limited (essentially by the uncertainty principle) to a resolution on the order of the wavelength of light used. The Near-Field Scanning Optical Microscope (NSOM) is able to overcome this fundamental limitation, by using evanescent fields. The most common NSOM design uses a fiber optic pulled down to a very fine tip with a sub-wavelength aperture at the end. The resolution of this type of microscope is limited only by the size of the aperture used. Unfortunately, as shown by Hans Bethe, the intensity of the light allowed through a sub-wavelength aperture falls off as the sixth power of the radius. Our alternative uses an optically trapped, resonant nanoparticle as a sub-wavelength, scanned probe. We expect to achieve super-resolution with improved signal-to-noise.

Poster Presentation P38

THE SYNTHESIS OF RESORCINARENES CATALYZED BY
BISMUTH TRIFLATE

Katie E. Peterson, Russell C. Smith and Ram S. Mohan*
Department of Chemistry, Illinois Wesleyan University

A synthesis of resorcinarenes **3** by condensation of aldehydes **1** with resorcinol **2** has been achieved using bismuth triflate as a catalyst. Resorcinarenes are of interest because of their applications as liquid crystals and as cavitands. Bismuth compounds are attractive as reagents and catalysts in organic synthesis due to their remarkably low cost and ease of handling. The influence of reaction time and solvent on product conformation will be discussed. Some mechanistic studies will also be presented.



Poster Presentation P39

**WOMEN IN PRIMARIES: A STUDY OF 1990-2002 PRIMARIES FOR THE U.S.
HOUSE OF REPRESENTATIVES**

Laura Pautz and Tari Renner*
Department of Political Science, Illinois Wesleyan University

Currently women comprise over 50% of the US population, yet only 14% of our national legislators are female.

Given the assumption that adding women to the US legislature does make a difference in representative government, research into the factors of elections that lead to women gaining office is significant. It is thus important to probe the bottlenecks that limit the number of women gaining seats in the US legislature. Primaries are theorized as one such tangible bottleneck that a woman seeking national office must pass.

The present study examines the US House of Representatives' primary elections from 1990-2002. Empirical data was used in frequency, trend, and regression analyses to probe the frequency of female candidates, the success of such candidates, and the variables regarding the candidate and district. Results of the analyses will be discussed.

Poster Presentation P40

DEVELOPMENT OF FRESHWATER SNAILS (PLANORBIDAE)

Amanda Pike and Elizabeth Balsler*
Department of Biology, Illinois Wesleyan University

Freshwater snails in the family Planorbidae are common inhabitants of river and lake systems in central Illinois. Like other pulmonate snails, *Planorbis* sp. reproduces by mutual exchange of sperm with hermaphroditic partners and internal fertilization of eggs followed by encapsulation of the zygote in an egg capsule. Each egg capsule is incorporated into an egg mass containing between 16 and 64 capsules. The egg mass surrounding the capsules consists of a jelly matrix surrounded by a thin chitin-like membrane. Encapsulated embryos develop within this mass, completing development and exiting the capsule 8-10 days after laying. This study of the development of *Planorbis* sp. was undertaken to determine if the egg mass material provides developing snails protection from UV radiation, which is known to cause abnormal development in other metazoans. As a first step towards this objective, the variability of the timing of development, as well as hatching time and size at hatching, were determined for lab raised individuals. Encapsulated embryos separated from the egg mass had similar development and hatching time to those within egg masses. Hatching time and size at hatching was variable for both snails separated from the mass and those still encased in the mass. In both groups, not all embryos reached hatching stage. Environmental factors such as light and algal growth correlated with inhibited development. Examination of the egg mass showed a change in consistency of the internal jelly within two to four hours after laying. Initially, the eggs may be separated from the egg mass and the extra-capsular jelly's consistency is that of a gel matrix. After four hours, capsules become fused to each other and to the chitin-like external membrane. During this change in the consistency of the jelly in the mass, a color change from translucent white to more transparent yellow also occurs.

Poster Presentation P41

**EFFECT OF PACLOBUTRAZOL, A GIBBERELLIN BIOSYNTHESIS
INHIBITOR, ON DARK-GROWN PROTONEMA OF
CERATODON PURPUREUS.**

Katie Polak and Loni Walker *
Department of Biology, Illinois Wesleyan University

Plants utilize chemical messages called plant hormones to regulate growth and development. One of these plant hormones, gibberellin, mediates a number of developmental processes in flowering plants, including seed germination, flowering, and stem elongation. While there is a wealth of information about GAs in flowering plants, there are only a few references in the literature concerning GA's in mosses, a non-flowering plant.

Preliminary research by former IWU student (Justin Paprick) suggested that the exogenous application of a GA biosynthesis inhibitor resulted in a decreased growth response in the moss *Ceratodon purpureus*. This decrease in growth suggests that endogenous gibberellins are important for growth in *C. purpureus*. To further investigate the role of gibberellins in *C. purpureus*, a GA biosynthesis inhibitor was applied to dark-grown protonema (a juvenile form in moss) and the growth response was analyzed. The results of this analysis will be presented.

Poster Presentation P42

**THE EFFECT OF LIGHT ON RATES OF CLONING OF THE
SYMBIONT-BEARING ACOEL *CONVOLUTRILOBA LONGIFISSURA***

Sara Rahim and William Jaeckle*
Department of Biology, Illinois Wesleyan University

The acoel turbellarian *Convolutriloba longifissura* reproduces primarily by asexual fission and engages in an obligate symbiotic relationship with unicellular algae belonging to the genus *Tetraselmis*. The obligate nature of the symbiosis between these species suggests that algal photosynthesis may influence rates of flatworm asexual reproduction. To test this hypothesis we explored the effect of light on *C. longifissura's* ability to clone. Worms (n=18/treatment) were incubated at light regimes of total darkness, 8L:16D, and 12L:12D for 30 days at $26 \pm 1^\circ\text{C}$. Worms held in complete darkness experienced 100% mortality after 14 days; mortality in all other light treatments was <4%. Cloning increased with a greater exposure to light (p=0.03). The average rate of cloning for worms exposed to 8L:16D light cycle was 0.022/day; rates of cloning by individuals held at 12D:12L was nearly 3X greater (0.061/day). Flatworm length and cloning rate were positively correlated ($r=0.77$, $p=0.01$, $n=36$); there were no significant differences in worm length among light treatments ($p>0.05$). Differences were detected in the cloning rates of worms exposed to blue, red, green, or white light for 20 days at $26 \pm 1^\circ\text{C}$. Cloning rates were highest for worms exposed to white light, lowest for worms exposed to green light, and intermediate for those exposed to red or blue light. These data provide evidence supporting the hypothesis that algal photosynthetic activity directly affects cloning by *C. longifissura*. We suggest that light conditions which promote photosynthesis in algae result in release of photosynthate to the flatworm and these materials fuel asexual reproduction. In turn, flatworms provide shelter and/or nutrients to the algae. This allows for the possibility of a mutualistic symbiotic relationship between *C. longifissura* and *Tetraselmis* sp.

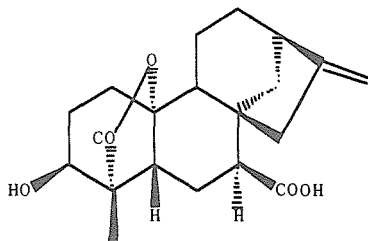
Poster Presentation P43

ISOLATION AND CHARACTERIZATION OF GIBBERELLINS
FROM THE MOSS *C. PURPUREUS*

Alison M. Redden and Rebecca Roesner* and Loni Walker *
Department of Chemistry and Biology, Illinois Wesleyan University

The plant hormone Gibberellic Acid (GA) is known to mediate a number of developmental processes in flowering plants, including fruit growth, germination, and internode elongation. Although the information concerning GAs in flowering plants is well documented, very few studies have addressed the roles of GAs in non-flowering bryophytes, specifically the mosses.

Recent evidence suggests that GA may also play an important role in the growth and development of mosses, specifically *Ceratodon purpureus*. Preliminary studies utilizing a GA biosynthesis inhibitor caused a dramatic decrease in *C. purpureus* growth, while the application of exogenous GA restored normal growth. These observations lead to the conclusion that Gibberellic Acid is vital to normal growth and function in the mosses. Results from further growth studies, as well as current attempts to isolate and characterize gibberellins from plant tissue are reported.



GA₄ – Commercially available C₁₉ GA

Poster Presentation P44

FABRICATION TECHNIQUES OF MESOSCOPIC DEVICES

Brian J. Simonds and Gabriel C. Spalding*
Department of Physics, Illinois Wesleyan University

The mesoscopic scale divides the regime of single atoms and molecules, where much is understood from quantum theory, from the regime of the optical microscope, where quantum “weirdness” is typically averaged away, in the collective, ensemble behavior of huge numbers of atoms and molecules. We seek the experimental means to span these length scales.

Electron beam (e-beam) lithography is a fabrication process that uses a tightly focused beam of electrons to create patterns with features on the nanoscale. For this purpose, we are interfacing an external control to the beam of a scanning electron microscope (SEM), which is normally an *imaging* tool rather than a manufacturing tool. By connecting the scan coils of the microscope to a card providing programmable outputs, we can sweep the electron beam in predetermined patterns. These patterns can be used to “expose” an energy-sensitive layer that we spin-coat onto our samples (either silicon, for micromachining, or metal-coated silica, for the creation of diffractive optics or transparent nanofluidic devices). The wavelength of an electron accelerated through 30,000 Volts is .071 Å, which implies that high spatial resolution can be achieved by working with such beams. In practice, resolution is determined both by scattering within the sample, and by the degree to which one can correct for aberrations in the electron optics of the SEM, which is the focus of our discussion.

Poster Presentation P45

**BEHAVIORAL THEORY OF TIMING APPLIED TO A
DRL LIMITED-HOLD PROCEDURE**

Jill Skarvan and James Dougan*
Department of Psychology, Illinois Wesleyan University

In recent years, the study of timing behavior has become an increasingly important part of behavior analysis. A number of theories have been proposed to account for an animal's ability to time short intervals. One such theory, The Behavioral Theory of Timing (BeT, Killeen and Fetterman, 1988) argues that the timing of short intervals is mediated by collateral/adjunctive behavior. While numerous studies have supported the predictions of BeT, the majority of those have been correlational, measuring a statistical relationship between adjunctive behavior and timing performance. The present experiments take an experimental approach, by manipulating the availability and probability of adjunctive behavior. Rats responded on a series of DRL limited-hold procedures in which subjects must wait a certain time interval before responding - early responses are not reinforced and reset the clock. The opportunity for adjunctive behavior was manipulated by providing a chewblock in some conditions but not in others. The results relate to previous studies from our lab, which found that the presence of a chewblock may interfere with timing behavior by causing the rat to wait too long and thus invoke the limited hold contingency.

Poster Presentation P46

DETECTION OF PESTICIDES IN MIDWESTERN WATER THROUGH HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Scott Smith and Stephen Hoffmann*
Department of Chemistry, Illinois Wesleyan University

Growing up in the Midwest, one cannot possibly go a day without realizing the high demand that this nation has on farming and agriculture. Although nearly everyone would agree that crop production is dependent on the use of pesticides, it is less likely that many would realize the degree to which these chemicals are used or the impact that they have on the environment. This study is designed to look at the impact that pesticide use may have on the environment, specifically in water systems. Many commonly used pesticides, both in farm and home use, have a tendency to remain present in the environment long after their initial application. The environmental effects of this buildup and accumulation, although unknown for all pesticides, are generally regarded as negative. Although initial application may require amounts as low as parts per billion, bio-accumulation may magnify the adverse effects of these toxins, making them a danger to aquatic life.

The purpose of this study was to develop a method for the detection and quantitation in natural surface water of a select list of commonly used pesticides, specifically atrazine, diazinon, tebuthiuron, and metolachlor. This list was generated based on pesticide families as well as likelihood of detection in Midwest water sources. A method was developed involving solid-phase extraction followed by reverse-phase liquid chromatography. Preliminary samples were then collected and analyzed from local rivers (Sugar Creek and the Mackinaw River). Results show that small traces of atrazine may be present in Sugar Creek, however there was no indication that any of our pesticides were present in the Mackinaw. This information may prove useful for determining whether or not new laws and regulations on pesticide usage need to be made to help protect the environment and native species.

Poster Presentation P47

**MACHINE VISION AND ANALYSIS FOR
OPTICAL MICROMANIPULATION**

Ryan Smith, John Van Fleet, Eric Macaulay and Gabriel C. Spalding*
Department of Physics, Illinois Wesleyan University

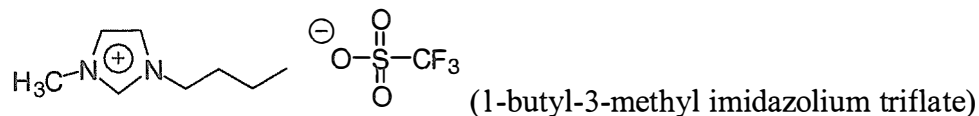
We are engaged in two distinct studies of optical micromanipulation, both of which require the development of machine vision algorithms. Our first study aims to characterize the extent of microparticle localization (*i.e.*, the trap volume) in a single-beam optical gradient trap (“optical tweezers”) via analysis of the distribution of particle positions over time, using the statistics of (three-dimensional) Brownian motion as a metric of the trapping potential. We hope to compare “isoprobability surfaces” for different laser wavelengths. Our second study involves multiple particle species that are *not* trapped, but are entrained within a microfluidic flow passing through a three-dimensional optical lattice. We hope to build up detailed statistics of particle channeling within the lattice, and the details of dense-flow interactions.

Poster Presentation P48

IONIC LIQUIDS AS NOVEL ENVIRONMENT FRIENDLY SOLVENTS FOR ORGANIC SYNTHESIS

Russell C. Smith and Ram S. Mohan*
Department of Chemistry, Illinois Wesleyan University

An important component of every organic reaction is the solvent. Most organic reactions have been traditionally carried out in volatile organic solvents which are a major source of air pollution. In addition, many of these solvents are flammable and also pose respiratory hazards. Hence the search for alternative solvents has assumed significant importance. Of the various solvents, ionic liquids seem to be the most promising. The advantages of ionic liquids are their non-flammability and practically zero vapor pressure. The rearrangement of epoxides to carbonyl compounds and the one-pot synthesis of homoallyl ethers from aldehydes have been accomplished in the ionic liquid, 1-butyl-3-methyl imidazolium triflate, using trimethylsilyl triflate, TMSOTf (0.1-1.0 mol %) as the catalyst. The results of these studies will be presented.



Poster Presentation P49

IMPROVING MDist

Kyle Stork and Lon Shapiro*

Department of Computer Science, Illinois Wesleyan University

For my Senior Research Project I have worked on the MDist project. MDist is used to create packages for the NSF Middleware Initiative (NMI). I have added features to MDist in an attempt to make it more useful to users. I have also been examining the implementation in an attempt to make MDist build the packages more quickly. MDist currently takes several hours to build and through parallel make files and a change from CVS to another revisioning standard, I hope to reduce the time that it takes for MDist to build.

Poster Presentation P50

**BCHP AND ITS ROLE IN BACTERIOCHLOROPHYLL SYNTHESIS IN
*RHODOBACTER CAPSULATUS***

Brian R. Wasik and David W. Bollivar*
Department of Biology, Illinois Wesleyan University

Rhodobacter capsulatus is a photosynthetic bacterium. Like most photosynthetic organisms, it can harvest light energy from the sun and convert into chemical energy. This bacterium utilizes bacteriochlorophyll in order to harness the light energy from its environment.

Bacteriochlorophyll biosynthesis involves a complicated series of biochemical reaction that include formation of a tetrapyrrole (a ring structure), the incorporation of a magnesium ion and modifications of the ring.

The goal of the experiments described in this poster is to identify the mechanism of an enzyme involved in making bacteriochlorophyll. This can be accomplished by generating an expression clone of the gene in *E. coli* cells using recombinant DNA methods. The expression clone can be used to make large amounts of the protein encoded by the gene for use in further experiments.

The work presented in this poster reflects the progress to date. The *BchP* gene has been isolated and amplified by Polymerase Chain Reaction. Successful amplification of *BchP* was accomplished and confirmed by agarose gel electrophoresis. The PCR product was isolated and purified.

The PCR product was ligated into a PCR-Script Amp cloning plasmid and was transformed into a competent strain of *E. coli*. The *E. coli* strain was grown and identifiable colonies with insert were isolated and cultured for growth. To date, attempts to identify correct insert of PCR product by agarose gel electrophoresis have produced no conclusive results. Immediate future experiments will focus on accomplishing this task.

Poster Presentation P51

**EGG VIABILITY OF MANIPULATED HOUSE WREN
(*TROGLODYTES AEDON*) NESTS**

Daniel P. Wetzel¹, Nathan D. Lading², and Charles F. Thompson²
and Given Harper*

¹Department of Biology, Illinois Wesleyan University

²Department of Biological Sciences, Illinois State University

The effect of extended pre-incubation storage on eggs of asynchronous laying birds has been examined in very few studies. Most studies on egg shelf-life are from commercial poultry egg producers who found that egg viability decreases as the length of un-incubated storage increases. Clutch manipulation studies are often conducted, but only a few studies investigate the effects of egg storage and manipulation on hatching success. We tested whether the short-term extension of un-incubated storage and the transfer of eggs to and from storage sites decreased the viability of house wren eggs in a nest manipulation study. There was no significant difference in the proportion of eggs that hatched that had been removed from nests and stored, and eggs that hatched that were not removed from the nest. This finding suggests that both the shelf-life of eggs and the transfer of eggs have no effect on the viability of the house wren eggs in the manipulation experiment. This implies that short-term storage and careful transfer of bird eggs in manipulation experiments will have minimal effect on the hatching success of those eggs.

Poster Presentation P52

**FATHER VERSUS STRANGER FACE DISCRIMINATION
IN THE HUMAN INFANT**

Erin L. White and Gail Walton*

Department of Psychology, Illinois Wesleyan University

The abilities of infants to recognize faces has gained attention in recent years, spurring many researchers to ask not only why and at what age infants recognize familiar faces, but also how the faces are imputed. However, with this surge of research, much of the focus has been on the ability of infants to discriminate their mother's face from that of a stranger. This research expanded on the current field by investigating the ability of infants to discriminate their father's face from a stranger. Through the use of an operant sucking device, the infant controlled the stimuli presentation and thus, controlled the picture seen. Preliminary data indicates that infants at least as young as 3.25 months of age are able to discriminate their fathers' faces from the faces of strangers. The future of this research includes further study of infants' perception, including further study of the abilities of infants to discriminate fathers from strangers in other situations as well as through other means of investigation

Poster Presentation P53

**DETERMINING THE BEST PROTOCOL FOR RAISING LARVAE OF THE
SEA URCHIN *EUCIDARIS TRIBULOIDES***

Elizabeth A. G. Whitehill, Kimberlee M. Butler and Elizabeth J. Balsler*
Department of Biology, Illinois Wesleyan University

Previous studies (Balsler, 1998, 2003; Eaves and Palmer, 2003) have shown that developmental stages (larvae) of sea stars and other echinoderms are capable of producing new larvae by cloning. One hypothesis emerging from the collected works on larval cloning is that this phenomenon is a pleisomorphic character for the Echinodermata. The pencil urchin, *Eucidaris tribuloides*; embodies several characters, such as the arrangement of skeletal plates, the number of tube feet per plate, and the morphology of the feeding teeth, that are considered primitive for the Echinoidea (the class to which sea urchins belong). Because *E. tribuloides* may represent an ancient lineage within the echinoids, we predict that the feeding larva of this species is capable of asexual reproduction during the larval phase. In further pursuit of this hypothesis, we attempted to determine the best protocol for culturing larvae of this species in the laboratory. Adult specimens of *E. tribuloides* were spawned, and fertilized eggs were raised either in stirred or unstirred filtered seawater. All larvae were exposed to a photoperiod of 12L:12D. Some animals kept in unstirred water were raised at room temperature (23-24°C), while others were placed in an incubator at 26°C. While all animals were fed the alga *Rhodomonas lens* (10⁷ cells per ml), some received a supplemental diet of EZ Larva™ (approximately 10⁵ particles per ml). We found that the larvae grew best at room temperature in moving water when they were fed only *R. lens*.

Poster Presentations (5)
P57, P59, P61, P63, P65

WILLIAM SHAKESPEARE'S *AS YOU LIKE IT*

Faculty Advisor: Sara Freeman*
School of Theatre Arts, Illinois Wesleyan University

Music

Author: Nick Tognoni

This poster describes both the role of musician in Elizabethan theatre and the role of music in *As You Like It*, one of Shakespeare's most musical plays. It shows music for versions of "Twas a lover and his lass" and discusses the instruments most commonly used in a theatrical setting.

The Pastoral Play: *As You Like It's* Court and Forest

Author: Stacy Barton

This poster defines the pastoral genre and explores how Shakespeare constructs his forest of Arden and ducal court to reflect the conventions of that genre.

Designing the Court and the Forest: Production History for *As You Like It*

Author: Amanda Johnson

The contrast between the court setting and the forest setting reflects the primary conflict in between nature and culture, duty and love in William Shakespeare's *As You Like It*. This poster compares the designs of three previous productions of the play, as well as showcasing the design solutions for the School of Theatre Arts current production of the show.

Playing *As You Like It's* Rosalind

Author: Sally Bell

This poster explores the interpretation and embodiment of Rosalind in the 19th and 20th century. Pictures of historical and contemporary actresses compliment analysis of changing attitudes toward the cross-dressing heroine.

Sources of William Shakespeare's *As You Like It*

Author: Edson Burton III

This poster provides information on Shakespeare's primary sources for his 1599 comedy: Lodge's narrative poem *Rosalynde*; the Bible, Ovid's versions of Greek myth, and the work of the performer Robert Armin (the actor who created the role of Touchstone).

Poster Presentation P66

**FACTORS AFFECTING ENVIRONMENTAL CONCERN
IN BLOOMINGTON-NORMAL RESIDENTS**

Divya Soni, Katie Wehr and Teodora Amoloza*
Department of Sociology, Illinois Wesleyan University

This study focused on environmental concern exhibited through behavior, not attitudes. We interviewed by telephone 415 Bloomington-Normal residents to obtain data that would enable us to examine the relationship between political orientation, education level, religiosity, household income, and gender and environmental concern. We created an index to measure environmental action. Bivariate results suggest that being liberal, very religious, and living in a low-income household are important factors in increasing an individual's environmental concern. While education level does not have a statistically significant relationship with environmental concern, percentages indicate a positive relationship between the two: the more education a person has, the more environmentally concerned s/he is. Using gender as a control variable, gender explains away the relationship between religiosity and environmental concern; the relationship between household income and environmental concern, as well as political orientation and environmental concern, is significant for women but not for men. For household income, the control variable reverses the bivariate result. With these results, we hope to provide information to local environmental organizations so that they can improve services offered to the community that strengthen the community's eco-friendly actions.

