SUNY College at Oneonta

# 2010 Student Research Day

**Thursday, April 22, 2010**
**Hunt College Union**
**SUNY College at Oneonta**

# 2010 Student Research Day

## April 22, 2010
## 1:00 PM – 5:00 PM
## Hunt College Union Ballroom

***Student Research Day is funded through charitable gifts and grants made to the College at Oneonta Foundation, and is sponsored by the Division of College Advancement, the Grants Development Office, and the College Senate Committee on Research.***

**Members of the 2009-2010 College Senate Committee on Research:**

Geoffrey O'Shea, Chair (Psychology),
Jacqueline Bennett (Chemistry & Biochemistry), Devin Castendyk (Earth Sciences),
April Harper (History), Kathy Meeker (Grants Development Office),
Scott Mangicaro (Student Representative), Brendan Walker (Student Representative)

**SUNY College at Oneonta**

# 2010 Student Research Day

# PROGRAM

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## 1:00 PM

## *Keynote Address*

Introduction: **Dr. William Pietraface**
**Chair, Biology Department; Member and Past President,**
**College at Oneonta Foundation Board of Directors;**
**Co-Chair, The Fund for Science and Technology**

# Dr. James A. Hayward '76

## *Which Goose in the Gaggle? Managing Science for Fun and Profit*

Dr. Hayward received his Bachelor's degree in Biology and Chemistry from SUNY College at Oneonta in 1976, his Ph.D. in Molecular Biology from SUNY Stony Brook University in 1983, and an honorary Doctor of Science from Stony Brook in 2000. He is Chairman, President and CEO of Applied DNA Sciences (APDN) which sells patented DNA security solutions to protect products, brands and intellectual property from counterfeiting and diversion. APDN technologies are used in a wide range of industries and provide a forensic chain of evidence that can be used to prosecute criminals (see www.adnas.com). Dr. Hayward's Keynote Address will emphasize the value of translational research in the relationships between industry, academia and government, and will also encourage students by emphasizing that they are all capable of leadership in any field.

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## 2:00 PM – 5:00 PM

## *Student posters, computer displays and other exhibits*

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# SUNY College at Oneonta
# 2010 Student Research Show

## STUDENT PARTICIPANTS

# FACULTY SPONSORS

# PRESENTATIONS

***Student:*** Peter Anderson
***Faculty Sponsor:*** Donald Allison, Jr. (Mathematics, Computer Science & Statistics)

**Asymmetrical Parallel & Distributed Computing**

The Cell Broadband Engine is a distributed computer processor capable of running instructions at upward of 200 gigaflops. The PlayStation 3 is currently the most cost-effective source of the Cell Engine Processor. When clustered together, PlayStations can reach supercomputer-level processing power. Our goal is to develop code and algorithms which take full advantage of the Cell Engine Processor's asymmetric architecture, and may also be distributed over the cluster. IBM's Cell SDK (a specially-developed set of software) and OpenMPI will be the main libraries used in our development process.

***Students:*** Peter Anderson, Luke D'Imperio, Timothy Kelley
***Faculty Sponsor:*** Hugh A. Gallagher, Jr. (Physics & Astronomy)

**The North-East CIDR Array: A Chain of Ionospheric Tomography Receivers for Studying the Equatorward Edge of the Auroral Oval and the Mid-Latitude Trough**

An array of Coherent Ionospheric Doppler Receivers (CIDR) was deployed in the northeast U.S. by the University of Texas at Austin Applied Research Laboratory. The receivers are used to infer electron density, and to determine how electron density varies in space and time. Spatial and temporal variations in ionospheric electron density are a response to solar-terrestrial interactions, and can have a direct impact on communication and navigation systems. This poster examines CIDR observations of the auroral oval and ionospheric trough over New York State.

***Students:*** Sakshi Bajaj, Ben Birkett, Bryan Folkl, Abhishek Lochab, Nikhil Patel, Halak Patel, Saurendra Shah, Gurpal Singh, Harpreet Singh, Robert Statts, Zishan Qamar Wariach, Amanda Willsey
***Faculty Sponsor:*** David Ring (Economics, Finance & Accounting)

**Second District College Fed Challenge Preparation**

This presentation shows what the SUNY Oneonta team did to prepare for the College Fed Challenge, an intercollegiate team competition which encourages students to learn about the macroeconomy, the Federal Reserve System, and the implementation of monetary policy. Each Fed Challenge team, which may consist of an unlimited number of students, prepares for a two-part competition. The first part is a 20-minute presentation, in which team members discuss current economic and financial conditions, provide a short-term forecast for the economy, and identify risks facing the economy, and make a recommendation for monetary policy. The second part consists of a 15-minute question and answer session, during which teams are queried on their presentation, hypothetical situations facing policy makers, and their knowledge of macroeconomics and the Federal Reserve System. While many students may take part in the preparation for the competition, only five of a team's members can represent it during the competition. Each team's presentation is judged by a panel comprised of leading professional economists, college faculty, and Federal Reserve economists; the panel asks questions and judges the team's responses. The SUNY Oneonta team competed in the first round of the College Fed Challenge against 32 other schools from the Second District on November 5, 2009 at the Sheraton Hotel in Manhattan, and advanced into the semi-finals, as did six other colleges. The team advanced through the semi-finals on the morning of November 20, to the finals that afternoon, taking third place in the Second District College Fed Challenge Competition. Of the two teams that bested SUNY Oneonta, the winning team won second place nationally.

***Students:*** Stephen Baker, Garrett Cadwallader
***Faculty Sponsor:*** Colby Thomas (Music)

**Lets Tokyo – Stop**

As a new decade begins, Lets Tokyo has become increasingly aware of the enormous changes undergone by our society. The rapid evolution and expansion of the digital era has changed the way we do business, meet others and hear music. Lets Tokyo's original composition, entitled "Stop," stresses the group's belief in balancing life in the digital era with the most basic elements of human culture: reading, learning, exploring the world, and face-to-face interaction. The song is a perfect reflection of our belief that too many people in this modern age have become slaves to technology and are slowly shifting away from human interaction. The lyric, *"When was the last time you laid on your back and just looked at the clouds?"* captures the essence of "Stop," which is featured in the video documentary presented, and is one of several examples of the genre of music offered by Lets Tokyo.

***Student:*** Hassan Baqer
***Faculty Sponsor:*** Marius Munteanu (Mathematics, Computer Science & Statistics)

**Mathematical Principles in Computerized Tomography**

Medical imaging has long been one of the first tools hospitals use for physical examination and diagnosis. The computerized tomography (CT) scan is one of the most commonly-used medical imaging techniques; what is not common knowledge is that mathematics plays a key role in obtaining the actual images. Using the intensity of the X-rays going in and out of the patient's body, one can calculate density values at every point, using Multivariable Calculus ideas and the Fourier and Radon Transforms, which make it possible to create an image by assigning a shade of gray to each point depending on its corresponding density. Interestingly enough, similar methods and techniques can be used to solve killer Sudoku puzzles, as well as other challenging problems. Whether the subject is X-rays or a sum of numbers, determining internal structure is all about knowing what goes in and what comes out along various paths.

***Students:*** Taylor Beasley, Christopher Swider, Tyler Smith, Nicholas Mazziota, Eric Siedner, Patricia Rees
***Faculty Sponsor:*** Florian Reyda (Biology)

**Parasite Diversity in Otsego Lake Fishes**

The goal of this long-term survey of the helminth parasites in fishes of Otsego Lake and nearby waters was to identify and document helminth species diversity. To accomplish this goal, fish were obtained (through hook-and-line or seining methods) during all four seasons beginning in fall of 2008. A full necropsy was conducted on each fish, including examination of the intestines, stomach, pyloric ceca, gills, liver, and body cavity. Parasite specimens found were preserved and prepared as whole mounted slides for microscopy study and identification. Results include parasite data on eight well-surveyed fish species (i.e., >20 individuals examined per species). We found a minimum of 15 species of helminthes, and one of these may be a new species!

***Student:*** Connie Belkevich
***Faculty Sponsor:*** Nigel Mann (Biology)

**Stripe-Breasted Wren: Tropical Bird Hoot Song Analysis**

The tropical Stripe-Breasted Wren sings hoot songs to attract a mate. Hoot songs were recorded in 2009 in the Costa Rican rain forest. Some spontaneous recordings were of males vocalizing to females; sometimes a hoot song was played to the birds to get a reaction. The hoot songs were analyzed before and after playback to compare male and female hoot songs. To analyze the hoot songs, the last note of songs was reviewed through a program called Raven. The frequency, tonal pitch, tonal frequency, and duration of hoot notes was analyzed and noted in spreadsheets, in order to see if hoot song frequencies altered as a result of playback.

***Students:*** Michael Benedict, Michael Behnke, Kyle Ellis, Troy Nieves
***Faculty Sponsor:*** Jen-Ting Wang (Mathematics, Computer Science & Statistics)

**The Effects of Textbooks on Student Performance**

This presentation compares whether or not there is a GPA difference between students who use textbooks versus those who do not. Using statistical tests and numerous different variables, we test whether or not it is in a student's best interest to purchase textbooks for their college classes.

***Student:*** Alexandra Bernat
***Faculty Sponsor:*** Jeffrey A. Fortin (History)

**From African to African American: Black Benevolent Societies in Newport, RI 1780-1844**

The colony of Newport, Rhode Island was founded on a peninsula with a severely small amount of arable land; therefore, the colony learned to rely heavily on trading goods and slaves. Newport merchants were among the most active slave traders in the entire Atlantic Ocean. Newport slaves grew up with a sense of their African roots, as well as feelings of inferiority due to some of the practices of their masters. When these slaves gained their freedom and started to grow in numbers, they joined together to address issues facing their community. Out of this, the first benevolent society was formed: The Free African Union Society of Newport, RI. It was formed predominantly to help members in the community solve problems, aid the ill, and, most importantly, to find a way back to Africa. The members of the Society felt like strangers in America, and many wished to return home. The Society lasted for a time; however, monetary issues, as well as disputes within the Society, caused it to disband. Later, some of the members of the first Society got together and formed the Benevolent Society of Newport. This Society, however, was separated by a generation from the first Society; their goals, therefore, were drastically different. They sought education and respectability in their community. While the two Societies had different goals, both struggled to fund themselves and promote their ideals, and both gave their communities hope and aid that proved to be the inspiration for many similar societies.

***Student:*** Kathryn Bevington
***Faculty Sponsors:*** James Ebert (Earth Sciences), Pavel Dufka (Czech Academy of Sciences)

**Early Devonian (Lochkovian) Chitinozoan Biostratigraphy of the Lower Helderberg Group, Appalachian Basin, New York State and the Age of the "Kalkberg" K-Bentonite**

A sparse chitinozoan fauna has been recovered from the Helderberg Group near Cherry Valley and Schoharie, NY. Samples from the Coeymans, Kalkberg, New Scotland and lower Becraft Formations have yielded moderately preserved, low-diversity assemblages. The New Scotland Formation (Fm) contains a Uranium-lead-dated ash (reported as "Kalkberg Bentonite") which has been used to place the Silurian/Devonian boundary at 418 million years (Ma) (Tucker, et. al. 1998). The age of this ash was designated as lower Lochkovian, based on its assumed position within the woschmidti conodont zone. Samples from the ash-bearing interval of the New Scotland Fm have yielded Lochkovian species *Eisenackitina bohemica* and *Margachitina catenaria*. In addition, samples from the base of the ash-bearing interval have yielded *Pterochitina megavelata* and *Cingulochitina ervensis*. Above the New Scotland, samples from the lower Becraft Fm contain late Lochkovian species *Eisenackitina bohemica* and *Fungochitina lata*. These data suggest that the "Kalkberg" K-bentonite is middle-Lochkovian in age. Our middle-Lochkovian assignment for the New Scotland Fm suggests that 418 Ma may be too young for the age of the Silurian/Devonian boundary and that the Devonian Period is longer than previously thought, by as much as 2 Ma.

***Students:*** Erin Bohen, Alissa DeBaun
***Faculty Sponsor:*** Charlene Christie (Psychology)

**The Effect of Others' Opinions on Self Evaluation**

This study investigated how in-group and out-group biases affect people's perceptions of their status group. Subjects completed a task whose results placed them into either a "high status" or a "low status" group. They were then given opinions from both in-group and out-group members. We then analyzed their opinions of the comments they read, both from outsiders and from those within their own group. From this data, we came to the conclusion that those people placed in high status groups have a higher self-evaluation when they receive supportive feedback, as compared to those in the lower status group.

***Student:*** Michele Daly
***Faculty Sponsor:*** Jeffrey Heilveil (Biology)

**The Benthic Macroinvertebrate Community Composition of the Butternut Creek**

The Butternut Creek was evaluated from September 27, 2009 to October 22, 2009 at four sites to determine the effect of recent flooding on the benthic macroinvertebrate community. A previous study, by Michael Stensland in 2002, was conducted to determine whether the composition of the macroinvertebrate community had a direct relationship with the stability and health of the river ecosystem. Although the river has experienced drastic physical changes, preliminary results of this study show that community composition has not been profoundly altered.

***Students:*** Matthew Dami, Rebecca Perry
***Faculty Sponsor:*** Tracy K. Betsinger (Anthropology)

**Bioarchaeological Study: Skeletal Analysis of Four Individuals**

The objective of our bioarchaeological research was to assess age, sex, ancestry, stature, and pathology in a human skeletal sample (n=4). The skeletal remains are fragmentary and display varying levels of preservation, with two of the individuals being markedly more complete than the other two. Due to poor preservation, it was often difficult to assess all bioarchaeological areas for each individual; nonetheless, when possible, age was estimated using sternal rib ends, auricular surfaces of os coxae, degree of epiphyseal fusion, cranial suture closure and dental wear. Sex was ascertained for adults via analysis of various cranial and pelvic characteristics. Ancestry was determined by assessing facial and cranial traits, as well as traits of the femur. Stature was estimated based on long bone lengths. Lastly, pathological conditions were noted when explicitly evident (e.g. trauma, periostitis, etc.). Initial results of the analysis indicate the presence of three adults and one subadult in the sample. Additionally, characteristics of the os coxae and crania of two of the adults are consistent with female features. Our analysis of these four individuals provided us with an invaluable introduction to and understanding of bioarchaeological techniques and methods.

***Student:*** Jessica DeCrosta
***Faculty Sponsor:*** Mary Ann Dowdell (Human Ecology)

**Enhancing the Martin Luther King, Jr. Magnet School Nutrition and Physical Education Programs**

Most young people in the United States do not make healthy lifestyle choices; this puts them at risk for both short- and long-term health problems. A review of literature indicates a need to increase both physical activity during the school day and the variety of healthy foods available within school meal programs. The objective of this research project was to increase physical activity and exposure to raw fruits and vegetables and whole grain products in fourth graders. A walking path with exercise stations was developed to keep students moving for ten minutes, two days a week. Taste-testing sessions were designed to increase student awareness of raw fruits, vegetables and whole grain products, while simultaneously determining the popularity of each item. An average of 56 (75%) fourth grade students participated in the program. On average, students were active for 9.33 minutes, two days a week. Six taste-testing sessions were presented.

The most popular items tested were kiwi (78%), honeydew melon (77%), broccoli with low-fat dip (61%), Triscuit® crackers (69%), and whole-grain granola bars (70%). Results showed that increased school day physical activity is attainable, and that students enjoy being active and eating a variety of healthy foods.

***Students:*** Steven DeMundo, Bryan Folkl, Sara Matrician
***Faculty Sponsor:*** Qun Wu (Economics, Finance & Accounting)

**Performance Evaluation of Six Mutual Funds**

This paper was written for the purpose of providing recommendations for the College at Oneonta Foundation, Inc., portfolio. Fund performance evaluation methods including the Sharpe and Treynor ratios, one- and three-factor regression models, and market timing models calculated for three-, five- and ten-year periods, indicate that the fund (AGTHX) currently held by the College Foundation is a sound investment. Meanwhile, there are other suitable funds for the College Foundation to consider in the future in order, to promote prosperity for the College.

***Students:*** Brittany Deno, Amanda Connor, Amanda Mall, Poletta Louis
***Faculty Sponsor:*** Joan Marshall (Educational Psychology & Counseling)

**Practicum and Faculty Mentoring Program Evaluations Conducted by Counseling Graduate Students**

Four graduate students in the Masters in Education School Counseling (K-12) program conducted program evaluations. Three of the four studies evaluated school counseling practicum students' performance and effectiveness of counseling in the schools; the fourth study evaluated the faculty mentoring program within the Division of Education. For school counseling practicum students, survey results and data were collected from previous semesters. The graduate researchers analyzed and presented patterns and average ratings for each topic; for instance, field supervisor evaluations suggest that supervisors have consistently evaluated their practicum students more highly in particular domains of the Conceptual Framework than in others. Overall ratings indicate that practicum students have lived up to the Conceptual Framework. The effectiveness of both individual and group counseling by practicum students implies that students significantly benefited from their experiences. The research that evaluated the Division of Education's faculty mentoring program gathered full-time faculty members' input via internet survey, and showed that mentors and mentees have similar expectations of the mentoring relationship, and are satisfied with the program, overall. All participants were also familiar with the Personnel Committee, which created and evaluates the faculty mentoring program, in addition to offering other services.

***Student:*** Natalie Diamante, Melanie Christman, Dan Pagan
***Faculty Sponsor:*** Geoffrey O'Shea (Psychology)

**Response Speed in Cued Reaction Tasks: An Analysis of Repetition and Alternation Effects**

In speeded-choice reaction tasks, the repetition effect is said to occur when reaction time (RT) to a stimulus identical to the previous stimulus is faster than RT to a stimulus that is different than the previous stimulus. Repetition effects are generally observed when the response-to-stimulus interval (RSI), or the time elapsing between the response to one stimulus and the appearance of the next stimulus, is less than 500 ms; however, for RSIs greater than 500 ms, an alternation effect is observed, in which responses to a stimulus that differs from the previous stimulus are faster. Theoretical accounts of these effects suggest that the repetition effect is due to automatic processes, whereas the alternation effect is due to conscious processes. In the present experiment, subjects were provided with a cue as to the nature of the forthcoming stimulus. Using RSIs of 375 ms and 750 ms, it was found that an alternation effect was observed under the shorter RSI, but that there was neither an alternation nor a repetition effect observed under the longer RSI. These results about the utilization of cues to speed alternation decisions indicate that the repetition effect may be mediated by conscious processes.

***Student:*** Veronica DiMola
***Faculty Sponsor:*** Jeffrey Heilveil (Biology)

**Phylogeography and Post-Glacial Range Expansion in *Acroneuria carolinensis* (Banks) (Plecoptera: Perlidae)**

*Acroneuria carolinensis* (Banks) (Plecoptera: Perlidae) is a predatory stone fly that lives in freshwater streams; its habitat ranges outward from the eastern coast of the U.S. This organism is sensitive to organic enrichment and needs highly oxygenated water, making it a good indicator of anthropogenic disruption. Historically, this insect's range experienced glaciation, which caused a mass migration of the species southward. Using the gene cytochrome oxidase I (COI), this project intends to investigate historical migratory patterns by sampling numerous populations along the eastern coast. The completion of this study will type the DNA of this specimen and produce a phylogenetic map, as well as providing a comparative study for future phylogenetic insect studies.

***Student:*** Luke D'Imperio
***Faculty Sponsor:*** Sunil Labroo (Physics & Astronomy)

**Study of the Hall Effect in Copper-Nickel Thin Films**

When charged particles move in the presence of a magnetic field with a direction that is perpendicular to the direction of the particle velocity, a potential difference arises that is orthogonal to both the direction of the particle velocity and the direction of the magnetic field. This potential difference is referred to as a Hall Voltage. In non-magnetic materials, this effect leads to the understanding of the type of charge carriers and their number density. We have produced thin metallic films, developed and constructed apparatus for the experiment, and observed and recorded this Hall Voltage in relationship to different currents and magnetic fields. Our experiments focus on the study of the Hall Effect when a metal such as Copper (Cu) is doped with small amounts of magnetic impurities such as Nickel (Ni). In our preliminary data for Cu-Ni thin film with 1 atomic % Ni, we have observed deviations from the "ordinary" Hall Effect. This deviation may be caused by magnetization of the Ni atoms in the presence of an external field, which influences the Hall Voltage observed.

***Students:*** Laura K. Douglas, Kirsten G. Nunez, Luis Cruz
***Faculty Sponsor:*** Erik Lind (Physical Education)

**A Diet and Physical Activity Profile of SUNY Oneonta Undergraduate Students**

Many young adults develop independent lifestyle habits during college as they begin to live in a self-directed environment. Two behaviors, dietary choices and physical activity, relate to overall health and well-being, and set the stage for the individual's post-graduation health lifestyle. Currently, little is known about the dietary and physical activity practices of SUNY Oneonta undergraduate students; the purpose of this investigation was to examine their current dietary and physical activity practices. The Diet and Exercise Assessment (DExA), a 70-item online survey, was sent to the electronic mail addresses of the SUNY Oneonta undergraduate population. The survey assessed the respondent's nutritional and physical activity perceptions, current practices, and knowledge of current recommendations. The response rate was approximately 15% (810 total responses; 72% female, 68% upperclassmen, 9% student athletes). The results suggest that the respondents engaged in some healthy behaviors, but lacked knowledge in critical areas of dietary and physical activity recommendations, suggesting that more needs to be done to educate SUNY Oneonta students about healthy dietary and physical activity practices. Future research should examine creative methods of educating SUNY Oneonta students in ways to more permanently incorporate healthy dietary and physical activity choices.

***Student:*** Samantha Fletcher
***Faculty Sponsor:*** April Harper (History)

**Legitimizing the Throne: The Use of Violence by Young Kings**

Throughout the Middle Ages, sovereigns strived to validate the supremacy of their thrones. Various rulers demonstrated their legitimacy through ties with the Pope and heritage. Kings who rose to power in their youth often used violence to authenticate their throne, especially since the coronation of a young monarch was commonly an effect of the previous monarch's untimely death. In the Late Middle Ages, four English monarchs who demonstrated the relationship between adolescence and ferocity were: Henry III, Edward III, the Black Prince, and Richard II. Henry, who inherited the crown at the tender age of nine, was also the son of the highly unpopular "bad" King John, while Edward's father, King Edward II, had been the first king to be deposed. Following in his father's footsteps, the Black Prince was under enormous pressure from nobles who had placed his father upon a pedestal, in an attempt to avoid the offenses of the late King Edward II. Finally, while Richard II came to the throne at the age of ten, he was surrounded by an aging gentry who questioned his very masculinity while he replicated the "femininity" of their advanced years. It is clear that the instability of a nation upon the unexpected death of a monarch, or the death of a Prince of Wales, created a very powerful nobility with the authority to mold, dictate, and govern a young king who had not yet inherited his full mature legitimacy. To restore these claims to the throne, violence was often used, as the use of politics by a monarch not yet of age would most certainly not be taken as seriously as the threat of ferocity. These four monarchs of the Late Middle Ages usurped the use of might to retain their own stability, in an era of revolutionary thought and the questioning of authority by figures such as Watt Tyler, Joan of Arc, and Martin Luther.

***Student:*** Caroline Fornshell
***Faculty Sponsor:*** Mary Ann Dowdell (Human Ecology)

**UCAN: Understanding Control Through Activity and Nutrition**

Behavior-modification programs that include physical activity, nutrition and other lifestyle improvements complement pharmaceuticals in blood glucose management in diabetic patients. The objective of this study was to improve behaviors associated with improved blood glucose in diabetic patients. Participants consisted of diabetic patients at Lackey Free Clinic in Yorktown, VA. A group class was offered weekly for four weeks. Concurrently, participants engaged in four weekly individual sessions with the instructor. Vegetable intake, whole-grain intake, plan-your-plate eating strategy, carbohydrate counting, stress, sleep, frequency of intake, and physical activity were measured at each individual session. A point was awarded per behavior if the participant improved each week; a point was deducted for each behavior which worsened each week, and zero points were awarded if the behavior did not improve or regress from the prior week. Waist circumference, weight, Hemoglobin A1C results, Body Mass Index, and knowledge were measured at the beginning and at the end of the program. Participants (n=10) significantly improved in vegetable and whole-grain consumption (0.7 correlation and 0.75 correlation, respectively), as well as plan-your-plate or carbohydrate counting (0.92 correlation), when correlated with attendance at classes. Patients significantly improved behaviors associated with blood glucose control as a result of participating in UCAN.

***Students:*** Lina Fox, Eileen Rodriguez
***Faculty Sponsor:*** Fred Zalatan (Biology)

**Environmental Sequencing of Microbes in Soil Samples**

Soil samples were collected from the Hunt Union Pond area, in order to analyze the bacterial species present. DNA was extracted and isolated from the samples, and a segment of bacterial DNA was amplified using the polymerase chain reaction (PCR). Experiments are in progress to sequence the amplified bacterial DNA. This method, also known as environmental sequencing, allows the analysis of bacterial species present in a soil sample without culturing the bacteria.

***Students:*** Linda Garvey, Darlene Miller
***Faculty Sponsor:*** Geoffrey O'Shea (Psychology)

**A Contemporary View of College-Aged Students' Dreams**

Dreams reflect our style of life, thoughts and beliefs. Presumably, the content of our dreams is also subject to the times in which we live. This study explored the extent to which dream content reported in two different eras differs. Specifically, we analyzed the content of 80 dream diaries from present-day undergraduate students at SUNY Oneonta and compared results to an earlier study by Hall and Van de Castle (1966). Using a variation of Hall and Van de Castle's system of dream coding, along with our own sociological interpretations, we examined differences in such dream features as anonymous vs. recognizable imagery, differentiated and undifferentiated gender, recurring scripts, and gender differences in dream content. In particular, our presentation focuses on the comparison of recurring dream scripts with undifferentiated gender content among college-aged students. The general categories of dreams that were included in this comparison were food-sharing dreams, potential mate dreams, and competition dreams. Results indicate that the genders are moving closer together in terms of sex and companionship when compared to the original Hall and Van de Castle analyses.

***Students:*** Linda Garvey, Ann Bischoff, Brianna Slutsky, Darlene Miller, Amber Benedict, Brittany Higgins
***Faculty Sponsor:*** Lawrence T. Guzy (Psychology)

**Unexpected Speed Changes as a Function of a Mystery Hill on West Street, Oneonta, NY: Research in Progress**

A mystery hill is a place where the surrounding terrain gives the illusion that one is traveling uphill, level, or downhill, when one is not. West Street, between Hartwick College and the SUNY Oneonta campus, contains a mystery hill, where the speed limit is 25 mph. Drivers tend to speed at this location. They may unconsciously allow their speed to increase, thinking that the perceived uphill will slow them down, when in actuality they are going downhill. As a result, this mystery hill could cause an unexpected and possibly unsafe change in speed. Research has focused on the amusing aspects of misperceiving the profile of the road, but unexpected speed changes associated with these hills have not been investigated. Researchers were positioned at three points along West Street. The first researcher signaled by flashlight when a vehicle coming down the hill reached a point prior to the mystery hill; the second researcher signaled by flashlight when the vehicle exited the mystery hill. The third researcher, holding a radar gun, was hidden behind a large evergreen tree, and recorded the speed at each location. Prior to the start of each test session, the radar gun was calibrated.

***Student:*** Daniel Gasperini
***Faculty Sponsor:*** Tracy K. Betsinger (Anthropology)

**An Assessment of Dental Pathology**

Dental remains are among the most represented materials in archaeological and forensic contexts. This is due to the fact that tooth enamel is the strongest and most resilient biological material of the human body. Most humans have fully-developed and erupted permanent teeth by the time they reach teenage years. Over the course of an individual's life, the teeth show physical wear and pathological changes due to a variety of factors, including diet, stress, poor hygiene, and lack of dental care. The pathological changes are, most commonly, dental caries, occlusal wear (attrition and abrasion), dental abscesses, enamel hypoplasia, and tooth loss. By assessing the dental pathology of an individual, much can be determined about the life s/he lived. In this study, the human dental remains of several laboratory and archaeological specimens were assessed for evidence of these pathological conditions. For all specimens, each tooth was examined, and pathological changes were noted. A specially-developed coding system was used to record the majority of pathological conditions. The Smith (1984) scoring system was used for identification of occlusal wear.

***Students:*** Sara Gaudioso, Kristen List, Melissa Sharp, Nick Pampena
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Consumer Acceptability of Chocolate White Chip Cookies, Dependent Upon Appearance, Texture and Taste, Using Puréed Black Beans as Fat Replacement**

The purpose of this study was to find an acceptable amount of fat replacement in a popular cookie, in order to make a healthier, yet still delicious snack option. With the increasing prevalence of obesity (especially in children, who are the biggest consumers of snacks like cookies) and consumer demand for healthier options in mind, it was our goal to create a marketable cookie with less total fat, saturated fat, and overall calories. We wanted to see if puréed black beans could replace the function of fat (butter) in these cookies and still produce an acceptable product. Samples were tested at 25%, 50%, and 75% fat replacement. Results showed that the sample with 75% fat replacement was very acceptable, with similar ratings to the control. Total calories were reduced by 6.5% in this sample, with a 50% decrease in calories from fat. Total fat decreased 42.5%, with a 50% decrease in saturated fat. Cholesterol was slightly decreased and fiber content was increased.

***Student:*** Rebecca Gower
***Faculty Sponsor:*** Vicky Lentz (Biology)

**Preliminary Characterization of Largemouth Bass (*Micropterus salmoides*) Immunoglobulin and its Unique Bonding Characteristics**

Little is known about the immune system of the Centrarchidae family of teleost fish. Our lab has begun studies on Large Mouth Bass (LMB, *Micropterus salmoides*) in an effort to isolate and purify Immunoglobulin M (IgM). Initially, total serum antibodies were purified from LMB using size exclusion chromatography. Native (non-denaturing) as well as Reducing sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) revealed several multimers of Ig, including, but not limited to, monomers, dimers, trimers and tetramers. The tetrameric bands were cut from Native gels and electroeluded to purify tetrameric Ig. Reducing SDS-PAGE of the purified Ig supports the conclusion that the molecule purified is, in fact, IgM.

***Student:*** Sarah Gravelin
***Faculty Sponsor:*** Dona Siregar (Economics, Finance & Accounting)

**Walk Away or Stay in California: The Long Term Effects on Household Wealth of the Decision to Strategically Foreclose**

The housing bubble and its subsequent burst left thousands of homeowners with negative home equity mortgages, known as “underwater homes.” This negative equity can be hundreds of thousands of dollars in states such as California, which have higher relative home prices than many other states. Many homeowners consider the option of a strategic default, meaning they can afford their mortgage but choose to have their home foreclosed upon, so they can buy or rent a cheaper home of equal or better quality than the one in which they currently live. This option is especially popular in states such as California and Nevada that are non-recourse states, meaning that the mortgage lending facility cannot take away anything other than the home in the event of foreclosure. Even though this option may seem attractive, what are the long-run effects upon a household’s wealth if they allow foreclosure and purchase another home in the future? Which is a better financial decision in the long run: to walk away from an underwater mortgage, or to continue to pay it off?

***Student:*** Regina Hanson
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Acceptability of Vanilla Ice Cream Prepared with Okra Gum as a Fat Substitute**

This presentation examines research done to assess the acceptability of vanilla ice cream prepared with okra gum as a fat substitute. Replacing fat with okra gum allows for a dessert choice which has the potential to prevent furthering the obesity epidemic.

***Students:*** Meredith Hartzell, Theanna Quarltere
***Faculty Sponsor:*** Charlene Christie (Psychology)

**Stereotype and Stigma**

Do group stereotypes affect self-esteem, and, as a result, are you more inclined to compare with individuals inside or outside your in-group? By manipulating the two independent variables of group stereotype and task difficulty, we examined the individual and combined impact of these variables on self-esteem and comparison strategies. Participants completed a series of pre-tests, tasks, and post-tests. The pre-test determined the strength of group affiliation, current self-esteem, and collective self-esteem as it pertains to being a member of a group. The following task manipulated stereotype threat, exposing half of the participants to information that negatively stereotyped their group and the other half to information that positively stereotyped their group. During the post-test, participants' group identification and self-esteem was measured again. Participants then compared themselves to others based on their performance on the manipulated task. We hypothesize that the self-esteem of individuals with loose group affiliation is less likely to be influenced by the manipulated task, and that they are more likely to compare themselves with out-group members.

***Students:*** Liza G. Hendricks, Michael P. Bergman
***Faculty Sponsor:*** Florian Reyda (Biology)

**Host Use and Morphological Variation of *Leptorhynchoides thecatus* from Otsego Lake, New York**

A survey of the helminth parasites of the fishes of Otsego Lake and nearby water bodies in Otsego County, New York was undertaken from September 2008 to the present. Fish were collected by hook and line, seine, or gill net. Over three hundred individual fish, representing nine species, were examined for intestinal helminths. Seven of the nine fish species examined were infected with adult specimens of the acanthocephalan *Leptorhynchoides thecatus*; however, gravid female *L. thecatus* were only found in the Largemouth bass, *Micropterus salmoides*. In each of the seven fish species infected with *L. thecatus*, worms were more frequently located in the intestine rather than in the pyloric cecae. Morphological features of the *L. thecatus* specimens encountered were compared with *L. thecatus* reported elsewhere. Of note was a conspicuous dorsal-ventral hook asymmetry on the proboscis. The variation in host use and morphological features of *L. thecatus* encountered in this study supports other recent studies that suggest *L. thecatus* represents several morphologically distinguishable species in North America.

***Students:*** Gouinda Jayanathan, Brooke Bellows, Kayla Corpin, Evangeline Shoemaker
***Faculty Sponsor:*** Geoffrey O'Shea (Psychology)

**The Effect of Articulatory Suppression on Hebb Digits Learning**

The Hebb Digits (HD) task, which involves incidental learning of a repeating nine-digit sequence, has been a useful paradigm for investigating the transfer of serial information from short-term to long-term memory. Previous results have indicated that equivalent learning of the repeated digit sequence occurs irrespective of awareness of sequence repetition (McKelvie, 1987). Recent research, using a modified HD task, suggests that incidental learning survives articulatory suppression, or a condition whereby rehearsal of the digits is prevented by having the subject repeat an irrelevant sound during digit presentation (Hitch et al., 2009). Moreover, Hitch et al. found that awareness of the recurrent sequence did not impact learning. The present study attempted to replicate Hitch et al.'s findings using the traditional HD task and Jacoby's (1991) process dissociation task, which is a more stringent awareness test. Results found learning of the repeated sequence was greater for aware than unaware participants in both an auditory and a visual HD task. These results, contrary to Hitch et al.'s findings, suggest that articulatory suppression limits HD learning, highlighting the influence of awareness on serial learning, as well as how awareness can be assessed in the HD paradigm using alternative methods.

***Students:*** Kevin Kahl, Tara Maslin, Megan Clement, Emily Ferencik
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**The Acceptabliliy of Banana Nut Muffins Produced with Flaxseed Supplement**

Flour can be replaced with flaxseed mill in bakery products to benefit the nutritional value of the products. This study was conducted to test the overall taste, color, flavor and acceptability of flaxseed-substituted banana nut muffins, compared to their original ingredients (including flour). The findings of this study will be greatly useful for dietetics professionals who suggest healthier ideas for their patients. The experiment replaced 30%, 50%, and 70% of the flour with the same percentage of flaxseed mill in banana nut muffins. All ingredients were measured using the same measuring devices, and all samples were baked for the same amount of time. The 100% flour banana nut muffins were the control group, and were compared with the four samples. Twenty-five SUNY Oneonta students evaluated each sample based on the taste, texture, color, flavor, and overall quality. The students varied from having general knowledge about food and nutrition, to having little or no knowledge. Each section for the evaluation had a rating scale of one to five, with five being the highest score given. This research may improve our nation's health and contribute to the techniques of healthy cooking.

***Student:*** Christopher Kakolewski
***Faculty Sponsor:*** Les Hasbargen (Earth Sciences)

**Mapping and Characterizing Late Glacial and Holocene Alluvial Fans in Upstate New York**

The Butternut Valley hosts a number of alluvial fans abutting the valley walls and resting at the mouths of several tributaries to the Butternut Creek. These fans were deposited during a time period ranging from deglaciation to ice-free conditions. We hypothesize that the distribution of post-glacial fans varies between valley types in this area. Basically, valleys that served as outlets for ice streams from the Laurentide ice sheet (through valleys) experienced active ice conditions, whereas non-through valleys experienced stagnant ice conditions. In both cases, exposed upland tributaries delivered sediment into the main valleys, which were still occupied by glaciers. Within non-through valleys, alluvial fans experienced deposition against or on stagnant (dead) ice. We propose that fan formation is most common within non-through valleys as opposed to through-valleys. Ice contact fans exhibit toes with distinct angles of repose and an undulating appearance from on-ice deposition. Fans deposited after ice retreat retain a classic fan semblance marked by a nearly linear profile and radial distribution pattern. We are beginning to more formally interpret fan distribution and areal extent using digital topographic data (USGS National Elevation Data), new high-resolution light detection and ranging (LiDAR) elevation data for parts of our field area, and field mapping.

***Students:*** Anyango Kamina, Michelle Linder, Samantha Kamp
***Faculty Sponsor:*** Jacqueline Bennett (Chemistry & Biochemistry)

**Formation of Metal Imine Complexes for Potential Use as Catalysts**

Combining organic ligands and metal ions leads to the formation of metal-ligand complexes. These complexes are utilized as catalysts, in SM-OLEDs (small molecule organic light emitting diodes), and as biosensors. Our research project involves the combination and reaction of imines (made previously by the BLONDES Research Group) and various metal-salts, which results in the creation of metal-imine complexes that can be used as catalysts. In order to create these complexes, we use ethyl L-lactate because it is a "green" solvent with a high boiling point, which allows for faster complex formation. Faster-forming complexes are necessary due to the fact that group three transition metals tend to form stronger bonds with the molecule that they are attached to; therefore, ethyl L-lactate is an appropriate solvent to utilize in order to break these bonds and form new complexes. In addition, certain metals, such as ruthenium, will likely lead to fluorescent or phosphorescent complexes (meaning that they will glow). We will explore this property further – if successful, these complexes will emit light for long periods of time. Such complexes can be utilized as SM-OLEDs in entities like flat panels and full color displays.

***Students:*** Jaclyn Kassoff, Elisabeth Levine, Gina McAteer, Kyle Hill, Emily Ferencik
***Faculty Sponsor:*** Lawrence T. Guzy (Psychology)

**Taste Perception: Are there Differences in Eating Habits and the Frequency of Fungiform Papillae (Taste Buds) between Dietetics Majors and Non-Majors?**

Recently, a unique method for distinguishing "non-tasters" from "super-tasters" in taste perception was developed. Applying blue food coloring to the tip of the tongue does not stain the fungiform papillae (which carry taste buds on their upper surfaces) blue. By placing a loose-leaf paper reinforcement containing a six-mm-diameter standardized opening, the number of fungiform papillae can be readily counted. Recently, several dietetics majors were identified as super-tasters, possessing more than 35 fungiform papillae, and living in a "neon" world of taste perception. We investigated the hypothesis that one factor for choosing a dietetics major may be the ability to differentiate among tastes in a superior fashion compared to non-dietetics majors. We recruited ten Dietetics and ten Fashion Industry students; each participant was administered the Three Factor Eating Scale, which examines subcategories of Hunger, Cognitive Restraint, and Disinhibition. The participant then applied blue food coloring near the tip of the tongue with a cotton swab. Two observers independently counted the numbers of papillae within a six-mm circle while looking through a six-inch magnifying lens.

***Students:*** Christopher Keefe, Christopher Kakolewski, Joseph Krikorian, Ross Todd, Annelise Muscietta, Michael Walsh, Wala Canario
***Faculty Sponsor:*** James Ebert (Earth Sciences)

**Sediment Starvation Along the Punch Kill Unconformity and Westward Onlap of the Kalkberg Formation (Lochkovian, Helderberg Group) in New York State**

The Punch Kill Unconformity (PKU) separates the Coeymans and Kalkberg Formations (Fm). The PKU is an irregular, pyrite-mineralized surface that records maximum marine flooding. At Cobleskill, this surface caps several decimeters of well-sorted, pyritic, nodular echinoderm grainstones that record *in situ* reworking of resistant skeletal debris. At Catskill, the lowest Kalkberg comprises four units. Unit A is a cherty, skeletal packstone, which is overlain by less cherty beds (Unit B). Unit C comprises pyritic, shaly mudstones with packstone interbeds, followed by interbedded packstones and shaly wackestones with holdfasts of *Mariacrinus stoloniferous* (Unit D). At Cobleskill, Unit B is more fossiliferous and directly overlies the PKU, followed by thinner and more fossiliferous occurrences of Units C and D. At Cherry Valley, Unit D rests directly on the PKU. The westward younging of units above the PKU demonstrates westward onlap of the Kalkberg Fm. All Units thicken eastward. Siliciclastics and pyrite also increase eastward, whereas faunal content and diversity decrease. These changes signal greater water depth and dysoxia to the east. Rapid changes in thickness and relative bathymetry suggest that Kalkberg onlap was driven by increased subsidence, rather than eustatic deepening; we interpret this as a distal response to earliest Acadian tectonism. An expanded version of this abstract was published by the Geological Society of America, following presentation at the combined meeting of the Northeast and Southeast sections in Baltimore, MD.

***Students:*** Devon Kelley, Amber Benedict, Will Benson, Savannah Sleicher, Brooke Bellows, Rebecca Kennedy
***Faculty Sponsor:*** Doreen Comerford (Psychology)

**Optical Illusions in Electronic Navigation Displays**

Many present-day navigation displays require judgments about distances, and those judgments depend on perceived space; for example, GPS displays in automobiles, traffic displays in aircraft, and air traffic control displays require distance judgments. Human lives and safety depend on these judgments, and if these judgments are impacted by the Filled vs. Unfilled Space Illusion, displays might be designed to either eliminate or reduce the impact of these illusions. This research evaluated the effect of the Filled vs. Unfilled Space Illusion by asking participants to imagine being an airline pilot utilizing a navigation display. The participants were shown flight

paths of varying lengths, and intervening points were superimposed on the flight paths such that the amount of "filled space" varied systematically. Participants were asked to judge the distance from their own aircraft to the farthest point on the flight path. An analysis of errors in judgments revealed a significant interaction between the length of the flight path (line length) and the number of intervening points. This finding suggests that the Filled vs. Unfilled Space Illusion may be important when making distance judgments in a practical setting such as a navigation task.

***Student:*** Tami LaPilusa
***Faculty Sponsor:*** Jeffrey Heilveil (Biology)

**Genetic Diversity of *Cardisoma guanhumi* Latreille (Crustacea: Decapoda) Populations on Andros Island, Bahamas.**

*Cardisoma guanhumi* Latreille, the blue land crab, is one of the species upon which the economy of Andros, an island in the Bahamas, hinges. Decades of over-harvesting have caused a precipitous decline in *C. guanhumi* populations. The size of the *C. guanhumi* metapopulation, and even the number of populations on the island, is unknown. Between the visually apparent decline in the number of crabs and the importance of the species to the Androsian economy, a study of the population structure and genetic diversity of *C. guanhumi* on Andros is critical. Using DNA sequences from the mitochondrial d-loop, this study will determine the number of genetically distinct populations, and the amount, if any, of gene flow between them.

***Student:*** David Larrison
***Faculty Sponsor:*** Sallie Han (Anthropology)

**Masculinity and the Male Pill**

*Male Birth Control in Popular Culture* is an in-depth analysis of the many perspectives of a male hormonal contraceptive. The project began in the fall 2009 semester with a quantitative analysis of data gathered from questionnaires, with comparisons from popular sources and scholarly articles. This independent research project offers a qualitative perspective to the study, with interview-based methods, including two focus groups. My hypothesis states that the current views of masculinity in society will prevent the widespread conceptualization of the Male Pill; furthermore, male hormonal contraceptive pills will be viewed as emasculating and a threat to how society views masculinity.

***Student:*** James Lauzun
***Faculty Sponsor:*** Kelly Gallagher (Chemistry & Biochemistry)

**Computational Modeling of the Hydration Shell of Snowflea Antifreeze Protein**

Antifreeze proteins are found in a wide variety of organisms, including plants, bacteria, insects, and fish. These proteins are thought to inhibit the growth of nascent ice crystals via an adsorption-inhibition mechanism. This indicates a role for protein recognition of the ice surface. Studies with several antifreeze proteins have demonstrated that there is a distinct hydration signature that correlates with antifreeze activity. The major feature of the ice-binding, or active, face, of these molecules is a topologically flat, relatively hydrophobic surface. A glycine-rich protein from the snow flea (sfAFP) represents a new class of antifreeze protein with an enhanced ability to inhibit ice growth. This study examines the dynamics and geometry of solute-induced structural distortions in water as determined from atomistic molecular dynamics simulations.

***Student:*** Amber Longe
***Faculty Sponsor:*** Nancy Bachman (Biology)

**Heat Shock Factor 1 in Mouse Cell Lines**

Heat shock factor 1 (HSF1) regulates the heat shock response in cells. Two different mouse cell lines will be tested. One type will be cancer-like and the other type will be more like normal animal cells. Each cell line will be tested for certain mRNAs that code for the heat shock proteins

(hsps). Our goal is to create a cell culture system that better demonstrates the physiological process of heat shock seen in normal cells.

***Student:*** Julie Ltaif
***Faculty Sponsor:*** Janet Nepkie (Music)

**When Music Went Viral**

It's 1985. You are walking through a high school courtyard during lunch hour; students are hanging around giant boom boxes, and music fills the air while quieter students bob their heads to their mixed tapes and favorite jams on their Walkmans. Fast-forward to present-day 2010. Walking through the same school's courtyard, all is quiet; students all have ear buds in their ears and are playing on their cell phones. What's happened? Among many factors, music went viral. As Music Industry students for the past three years, my closest friends and I have kept up-to-date and knowledgeable about the music world around us; however, I was curious about the average person's current views on, and awareness of, the music world. Since the development of mp3s, free downloading, and portable mp3 players, there can be no doubt that the ways people value, and feel about acquiring music have changed, in fact so greatly that the music industry business model that worked from the 1940s until the late 1990s has completely disintegrated and must be rebuilt. Therefore, I set out to survey the average American to see if there actually are trends or stable views amongst music listeners today.

***Student:*** Matthew Lundquist
***Faculty Sponsor:*** Donna Vogler (Biology)

**Observation of Honey Bee (*Apis mellifera* L.) Flower Choice of Native Yellow Trout Lily (*Erythronium americanum* Ker-Gawl.) and Non-native Garlic Mustard (*Alliaria petiolata* (Bieb.))**

Non-native, invasive species become an ecological problem when they take over a particular area and out-compete native species. Invasive plants like garlic mustard (*Alliaria petiolata* (Bieb.)) can put pressure on native plants by competition over pollinators. If the invasive plant can attract more pollinators than a native plant, the fitness of the native plant can be negatively affected, either through lowered levels of outcross pollination or by loss of pollinator service altogether. The goal of this project is to present honey bees (*Apis mellifera* L.), a major pollinator, with both flowers of invasive garlic mustard and native yellow trout lily (*Erythronium americanum* Ker-Gawl.) flowers, to test the preference of bees in visiting one species over the other. Experimental arrays of flowers in different combinations of garlic mustard and trout lily will be presented to bees foraging near an active hive, and rates of visitation will be recorded.

***Students:*** Mattthew Lundquist, Luke Soposki
***Faculty Sponsor:*** Jen-Ting Wang (Mathematics, Computer Science & Statistics)

**Regressional Analysis of Endangered Species in the United States**

The number of endangered species varies widely in each state throughout the U.S. An assortment of factors, including climatic, economic, and agricultural variables, can contribute to this phenomenon. Determining the correlation between these variables is the first step in the formulation of conservation policies. The goal of this study is to use statistical software and regression analysis techniques to find the correlations between the number of endangered species and numerous factors.

***Student:*** Kelly MacDonald
***Faculty Sponsor:*** Mary Ann Dowdell (Human Ecology)

**"Try Five" – An Elementary School's Introduction to the Importance of Eating an Adequate Number of Fruits and Vegetables**

Childhood eating habits often carry over into adulthood. U.S. children's intake of fruits and vegetables is grossly inadequate. Studies have shown that fruit and vegetable promotions can be successful at increasing knowledge and consumption of fruits and vegetables. This program

evaluated the effect of an interactive fruit and vegetable promotion upon knowledge and consumption of fruits and vegetables. The K-4 grades students at Richmond Consolidated School (n=75) participated in this study, which consisted of four weeks of classes, "Food Fun Fair," and a parent website. Matched pre- and post-tests were given to assess the students' knowledge of nutrition. Intake of fruits and vegetables was assessed through pre- and post-intervention 24-hour dietary recalls completed by their parents. From 71 pairs of matched pre- and post-tests, every student showed improved knowledge. Kindergarteners, who started with the lowest scores, showed the largest improvement. First- and second-graders had the highest average scores on the post-test and seemed to benefit most from this intervention. Dietary recall results showed an average 0.93 and 0.23 serving per day increase in fruit and vegetable consumption, respectively. Findings indicated an improvement in the students' nutrition knowledge and consumption of fruits and vegetables after participating in the program.

***Students:*** Alyson Marmet, Kaitlyn Charles
***Faculty Sponsor:*** Jacqueline Bennett (Chemistry & Biochemistry)

**Quantification of Energy, Solvent, and Reagent Cost in Imine Synthesis and Comparison Between Modern and Traditional Methods**

Ethyl L-lactate, a solvent that is approved by the FDA as a food additive, is derived from renewable resources, and is biodegradable. Recently the commercial synthesis of ethyl L-lactate has become optimized, and it is now offered to the public at a cost comparable to traditional organic solvents. This development led to the discovery of the synthesis of imines by an ethyl L-lactate and water co-solvent by Bennett et al. (the water is used to tune the reaction conditions to optimize results at room temperature). Imines are important intermediates in the synthesis of complicated amines. They are also the basis of many pharmaceutical products. The traditional method for synthesizing imines is very time-inefficient and uses many more materials (water, heat, and excess solvents for purification) than the novel, "green" method. By measuring the amount of water used, using an energy meter to measure the energy consumed, and quantifying the amount of excess solvent, we will be able to determine the actual costs and impacts of performing each type of synthesis with quantitative data (amount of energy in kilowatt hours, amount of solvents in liters, and amount of water in liters) instead of just qualitative data.

***Student:*** Taylor Martin
***Faculty Sponsor:*** Yun-Jung Choi (Human Ecology)

**Culture Shock**

The goal of this project was to create a high-end fashion line made strictly of previously-used materials. Fascinated by the lives of other world cultures, various elements from rituals and customs of tribes throughout Africa, as well as aspects of Tibetan Buddhism, were incorporated into my designs. These two cultures have inspired me time and time again; their resourceful nature and way they live in harmony with the world around them is something that I admire, and were the reason that I chose to work with only recycled materials. Jane Goodall stated: "It's awfully sad, that with our clever brains capable of taking us to the moon, we seem to have lost wisdom, and that's the wisdom of the indigenous people who would make a major decision based on, how will this decision affect our people seven generations ahead?" I feel that in today's world, we are fortunate to have so many already-existing materials, and that we have the ability to take what is old and create so much new!

***Students:*** Elizabeth Maziejka, Evan Magnone, Samantha Forster, Corey Coppola
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Fat Replacement in Rice Crispy Treats**

As the number of obese Americans increases, so does the need for products using less fat. Heart disease is the number one killer in our country, and may be partially caused by too much fat in the diet. In order to create a dessert with less fat, we propose to substitute the margarine in Rice

Crispy Treats with various proportions of pear purée. This study will replace 25%, 50%, 75% and 100% of the margarine with the same percentage of pear purée in Rice Crispy Treats. The 100% margarine Rice Crispy will be the control group, to be compared with the four alternations. A blind taste evaluation will be done by twenty-five partly-trained participants to test each of the four alternative products, and the control product. The taste, texture, color, flavor and overall acceptability will be evaluated in the taste survey. This research may contribute to the techniques of healthy cooking and improve our nation's health.

***Students:*** Erica McCarthy, Samantha Schwartz, Amy Sibert, Liz Hall
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**The Application of Chickpeas on the Texture, Color, Integrity, Volume, Flavor, and Overall Acceptability of Gluten-Free Chocolate Cupcakes**

Gluten is the essential structure-building protein in wheat. Gluten complexes result in viscoelastic dough. Viscoelastic properties are needed to produce good-quality baked products that can properly develop during kneading, leavening, and baking. To individuals with allergies, intolerances, or celiac disease, however, the gluten complexes can be very harmful; their avoidance of gluten from wheat, barley, and oat proteins is mandatory. The removal of gluten in bakery products often results in a liquid batter, crumbling texture, poor color, and other post-baking quality problems. Currently, many gluten-free products are available, but are of low nutritional quality, exhibit a dry crumb, and have poor mouth-feel and flavor. The main aim of our research is to use gluten-free flour and chickpeas to influence the texture, color, shape/integrity, volume, flavor, and overall acceptability of gluten-free chocolate cupcakes while producing a gluten-free product that contains higher protein and dietary fiber levels. The methods and materials used in the this experiment include: a control cupcake (Sample One) made with all-purpose flour; Sample Two, made with 75% gluten-free flour and 25% chickpeas; Sample Three, made with 25% gluten-free flour and 75% chickpeas; and Sample Four, made with 100% chickpeas. A survey will be used to test the acceptability of texture, color, shape/integrity, volume, flavor, and overall acceptability for the four samples of gluten-free chocolate cupcakes.

***Student:*** Rachel McDermott
***Faculty Sponsor:*** Gina L. Keel (Political Science)

**Composting SUNY Oneonta's Food Waste**

My research involves testing the feasibility of composting SUNY Oneonta's food waste through creating a small-scale pilot composting project. One 157-gallon compost bin will collect food waste from the Wilsbach Hall dining area, diverting it from a landfill. While this food waste decomposes, I am collecting data on heat, odor, visual appearance, acidity, nutrients, and moisture content. The project's success will be determined by final compost material neutrality (pH), scale, and size (i.e., if the materials are broken down enough to be used for landscaping). Another consideration will be the amount of waste that was diverted from the trash. Observations from this project will serve as model for future large-scale campus composting projects.

***Student:*** Marcela Micucci
***Faculty Sponsor:*** Thomas Beal (History)

**The Infanticide Epidemic: Poverty, Abandonment, and Illegitimacy in Antebellum New York City**

This project explores mothers who killed their infants in mid-nineteenth century New York City. My research focuses primarily on the social and economic motives behind the crime, as well as its prevalence over time. In order to do this, I analyzed thousands of New York City Coroner's reports from 1835 to 1845. I also read and examined early American newspapers, such as the *New York Herald* and The *Weekly Herald*. As a result, I learned that infanticide and infant abandonment were a part of everyday life in the mid-nineteenth century. Infants were found floating in the river, abandoned in alleyways, tossed over church burial grounds in coffins, and even uncovered in pickle casks and privies. By analyzing the causes of death of these infants, as

well as their location by street and ward, I have used the coroner's reports to track not only the types of women that were committing infanticide, but also why the crime was occurring on such a large scale. I also found trends in the high ratio of White infant deaths compared to that of Black infant deaths.

***Students:*** Karley Morgans, Kristen Hohorst, Christopher Goroleski, Hannah Sloboda
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Fat Replacement in Carrot Cake**

Obesity, diabetes, and heart disease are just a few health issues that many Americans face today. The high fat and sugar content that is often found in foods items contribute to the risk of developing these diseases. Research has been done in attempt to limit the use of fat in recipes, yet maintain the same characteristics that people want when they consume the product. An effective way to lower the fat content and preserve flavor in food is to use fruit purée as a substitute for oil. The purpose of this study was to determine the acceptability of pumpkin purée as a fat substitute in carrot cake. The control carrot cake used 100% vegetable oil; the first experimental cake used 50% oil and 50% pumpkin purée. The second experimental cake used 25% oil and 75% pumpkin purée, and the last experimental cake used 100% pumpkin purée, without using oil. Twenty-three people evaluated the cake in the pilot study. Areas that were examined by the participants were the taste (mouth feel), texture, color, flavor (mouth feel + smell) and the overall acceptability. The sample with 50% oil and 50% pumpkin was the least favorite, scoring 57% acceptability. The sample with 100% oil scored a 62% acceptability. The sample with 25% oil and 75% pumpkin scored a 72% acceptability. The last sample, with 100% pumpkin, scored an 81% acceptability. The results of this experiment were positive and revealed that pumpkin is an excellent fat substitute in carrot cake. A future taste evaluation will be administered with 200 more participants, to confirm the reliability of the findings.

***Student:*** Blake Moses
***Faculty Sponsor:*** Nancy Bachman (Biology)

**Subcellular Localization of Mouse Heat Shock Factor 1 Alpha and Beta Isoforms**

Heat shock transcription factor 1 (HSF1) is activated by stressors in cells, such as heat. The protein is thought to be inert (monomer form) under a normal cellular environment and active (trimer form) when stress is put on the cells. The cellular location of HSF1 before and after stress was the main concern of the research. To determine the localization of HSF1, we used mouse NIH/3T3 cells, which contained tagged mouse HSF1 protein, detectable with specific fluorescent antibodies. The cells were put under both stressful conditions and normal (control) conditions. Under control conditions, we discovered that HSF1 is predominantly a protein in the cytoplasm of cells; previous studies have shown the protein to be mostly found in the nucleus. Immunofluorescent microscopy of the hemagglutinin (HA) tagged constitutive isoform under normal cellular conditions determined that the protein was concentrated in the cytoplasm. Heat-shocked and cold-shocked NIH/3T3 cells, with tagged HSF1, will be tested next to determine the localization of the protein.

***Students:*** Annelise Muscietta, Joseph Krikorian, Ross Todd, Michael Walsh, Christopher Kakolewski, Christopher Keefe, Wala Canario
***Faculty Sponsor:*** James Ebert (Earth Sciences)

**Sedimentology of the Uppermost Coeymans Formation and Lower Kalkberg Formation (Lochkovian, Helderberg Group) on I-88 Near Cobleskill, NY**

Near Cobleskill, the uppermost Coeymans Formation (Fm) comprises fine to coarse biosparites with abundant *Lepocrinites gebhardi*. Disarticulated brachiopods, bryozoans, tabulate corals and trilobites are common. Nodular bedding suggests extensive bioturbation. Remnant ripples and cross-stratification, winnowed textures and a predominance of filter feeders indicate frequent wave or current agitation on the Helderberg ramp. The Punch Kill Unconformity (PKU) separates the Coeymans from the overlying Kalkberg Fm. The PKU is overlain by bioturbated calcisilt,

followed by shaly to fossiliferous micrites with interbeds of poorly washed biosparites to packed biomicrites. Brachiopods dominate, and many are in life position. Diverse bryozoans, trilobites, rugose corals, echinoderm debris and rare orthocones are also present. The shaly micrites represent the background deposition below normal wave base. Shell lags were concentrated by storms that winnowed mud from the lower ramp. This Unit is abruptly overlain by dark, pyritic, shaly micrite, which records dysoxia and rapid deepening. The remaining Kalkberg comprises thick beds of fine, echinoderm biosparites to packed biomicrites, with holdfasts of *Mariacrinus stoloniferous*. Bryozoans, brachiopods and small rugose corals are common. These strata accumulated on an intermediate portion of the Helderberg ramp, which was deeper than the upper Coeymans Fm, but shallower than underlying lower Kalkberg. An expanded version of this abstract was published by the Geological Society of America, following presentation at the combined meeting of the Northeast and Southeast sections in Baltimore, MD.

***Student:*** Scott Nichols
***Faculty Sponsor:*** Thomas Beal (History)

**Rise of the B'Hoy: The Emergence of New York's Violent Working-Class Masculine Identity**

In the first half of the nineteenth century, the men in New York's working class underwent a transformation of identity. This transition was epitomized by the creation of what historians have designated the "B'Hoy," a violent man whose self-worth was not defined by his ability to provide for his family but by his physical prowess. The origins of the notorious B'Hoys of the 1850s, such as William Poole and John Morrissey, lay in the men of previous decades: men of less acclaim who struggled to succeed in the burgeoning capitalistic economy of New York. The men who created and lived by the violent tavern lifestyle of the working class redefined the manner in which they proved their worth to one another. Men like William Poole owed their acceptance to the generations prior that struggled to establish the characteristics that defined the B'Hoy.

***Students:*** Sarah Nicoletti, Casey Renko
***Faculty Sponsor:*** Joseph P. Chiang (Chemistry & Biochemistry)

**Synthesis of Silver Nanoparticles Using a Microwave Method**

Silver nanoparticles are particles between 1nm and 100nm in size. These silver nanoparticles have a wide variety of applications, such as surgical instrument coatings, or as cathodes in batteries. Mixtures of Silver Nitrate (AgNO3) and D-glucose were prepared at known concentrations, varying the molarity of D-glucose for each sample. By varying the molarity, we were able to find the optimum concentration at which these nanoparticles could be produced. The samples were prepared in 4mL aliquots, placed in the CEM Mars-5 Microwave and heated at 800W; the heating times were either 8 or 12s in order to determine the best conditions for synthesis of silver nanoparticles. After heating, the samples were cooled, then transferred to ceramic crucibles and placed in an autoclave for 24 hours. The resulting nanoparticles were sent to the University at Albany for analysis. The conclusions drawn from this analysis will provide us with the information needed to continue our research.

***Student:*** Gwendolyn Nieves
***Faculty Sponsors:*** Kelly Gallagher (Chemistry & Biochemistry), Nancy Bachman (Biology)

**Purification and Crystallization of Human CGI-112**

Research objectives are to produce and purify the human Comparative Gene Isolate 112 protein (CGI-112), to establish optimal conditions for crystallization utilizing a hanging drop vapor diffusion technique, and to experimentally determine its structure via x-ray diffraction. The three-dimensional structure of a protein is vital, as it determines biological function. The function of the CGI-112 protein is currently unknown. If experiments are successful, comparison of the resultant structural model with known protein structure and function will enable researchers to propose a protein function and will permit them to investigate present protein folding theories. In order to determine the CGI-112 protein structure, a sufficient quantity of its purified form must be

obtained. Bacterial cells that contain the CGI-112 gene will produce the protein and will then be modified to contain a "His" tag. This tag is utilized to purify the protein using an affinity column that bonds to a molecule that recognizes the His tag. The protein of interest will then adhere to the matrix. Once nonbinding molecules pass through the matrix, the protein of interest is removed by altering solvent conditions.

***Students:*** Katie Nugent, Stacey Castillo
***Faculty Sponsor:*** Charlene Christie (Psychology)

**Stereotypes and Sexism**

The experienced ease of recall of stereotypes was used to determine whether people inferred something about their own prejudice. The subjects were asked to list either four or twelve gender stereotypes and to rate the difficulty of that task. Subjects then completed the Ambivalent Sexism Inventory. Our hypothesis is that subjects who listed four stereotypes perceived this task as easy, and therefore thought of themselves as more sexist. Subjects who had to list twelve stereotypes are thought to perceive this as a more difficult task, and therefore not think of themselves as sexist. We also predicted that people who had to only list four stereotypes would score higher on the Ambivalent Sexism Inventory than the people who were asked to list twelve.

***Students:*** Katherine Ogut, Brianna Olsen, Maribeth Rubenstein
***Faculty Sponsors:*** Gina L. Keel (Political Science), Thomas M. Rathbone (Facilities)

**State University of New York College at Oneonta Greenhouse Gas Inventory**

Environmental sustainability is one of the tenets of SUNY Oneonta's institutional philosophy. Because carbon emissions are a major contributor to global climate change, evaluating and reducing our carbon footprint is one way that the campus can support this principle. Greenhouse Gas Inventories are a method of tracking carbon emissions by source and amount. These inventories can be used to demonstrate a college's emission record over time and in comparison to other college campuses. This data can be used as a basis for creating a Climate Action Plan and to inform the budgetary and resource decisions necessary to achieve those goals. In fall 2009, SUNY Oneonta's first Greenhouse Gas Inventory (Year 2008) was conducted. Methodologies were developed as data was collected. Upon completion of the raw data collection, the information was entered into the *Clear Air-Cool Planet Calculator* spreadsheet. The calculations revealed various statistics, including the College's total carbon emissions in metric tons. These results were analyzed and presented in PowerPoint and written reports to faculty and administration. An inventory is currently being conducted for Year 2000. This is the second in a series of inventories tracking campus emissions from 1990 (Kyoto Protocol) through the current year and beyond.

***Students:*** Kara Parnett, Jillian Richards
***Faculty Sponsor:*** Nathan Gonyea (Educational Psychology & Counseling)

**The Influence of Gender and Year in School on Pre-Service Teacher Attitudes and Perceived Competence Toward Educational Research Paper**

We conducted a survey with 212 undergraduate education students from SUNY Oneonta. The sample consisted of 45 male and 167 female participants; 103 of these participants were juniors, 81 were sophomores, 25 were seniors, 3 were freshmen, and 3 classified themselves as others. This study examined the attitudes and perceived competence of these pre-service teachers. These attitudes and perceived competences were further examined in terms of gender and upperclassmen and lowerclassmen. This study found that there was no difference in attitude toward educational research between men and women, and that males had a significantly higher perceived competence than females. This study also determined that upperclassmen and underclassmen have statistically similar attitudes toward educational research; there was no significant difference in perceived competence between upperclassmen and underclassmen.

***Student:*** Briana Parsons
***Faculty Sponsor:*** Jeffrey Heilveil (Biology)

**Development of Microsatellite Markers for *Acroneuria carolinensis* (Banks) (Plectopera: Perlidae)**

An efficient way to study an ecosystem is to focus on an important contributor to ecological interactions. *Acroneuria carolinensis* (Banks), a member of the family Perlidae, plays a multifaceted role in its environment. They are major predators in stream systems, and are also a food source for game fish, supporting this $700 Million industry in New York. One way of assessing the health and viability of populations is by examining genetic diversity, which can be done in multiple ways. Using microsatellites for genetic work is a less expensive approach than DNA sequencing, but still allows population structure patterns to be determined. There are currently no microsatellite markers developed for the family Perlidae. The proposed project will result in the development of a suite of 9-15 microsatellite markers from across the genome of *A. carolinensis* that will be easily scored in this and other confamilial species. Broadly applicable markers are a highly sought commodity among molecular ecologists. Using the DNA from an individual, restriction enzymes will be used to create a genomic library. This library will be enriched for microsatellite-containing fragments, which will then be cloned and sequenced. PCR primers will be designed for promising fragments and tested on other individuals.

***Students:*** Calla Peters, Megan Raggi, Dana Scarano, Renae Terbush, Jessica Hurtt, Ryan Alford
***Faculty Sponsor:*** Dawn Hamlin, Nathan Gonyea (Educational Psychology & Counseling)

**What's Gender Got to Do With It? The Role Gender Plays in Special Education**

Gender is often an overlooked factor in special education. While it has been noted repeatedly that many disability categories (i.e., Emotional/Behavioral Disability [EBD]; Wagner et al., 2005) have disproportionate numbers of males compared to females, little research and training is devoted to address the 'why' behind those numbers. This presentation looks at the role gender plays in exceptionalities and provides ideas to help the often-missed female exceptional students.

***Student:*** Daniel Pneuman
***Faculty Sponsor:*** Paul Conway (Political Science)

**Muslims in the Maw of 20th Century Genocide**

The stunning degree to which entire groups were victimized by murderous regimes during the last hundred years has caused some political scientists and historians to describe the period as "a century of genocide." Then, as in previous centuries, countless numbers of mass murderers were motivated by their religious beliefs and millions were targeted because of their religion. In the west, Islam has long been characterized as "a religion of the sword." For many, this perception still seems to be widespread. Given this persistent, stereotypical view of Muslims, it may be useful to examine how they were involved during some of the well documented genocides that occurred during the twentieth century. This paper examines genocides from the Armenian to Rwandan, regardless of whether Muslims were perpetrators or victims, and takes into account many factors including religion, social context, political state of affairs, and economic conditions surrounding each period of genocide in order to gain a complete picture of stresses and motivators that induced the perpetrators to commit the most heinous act of violence known to humankind.

***Student:*** Nefretiti Pough
***Faculty Sponsor:*** Donna Vogler (Biology)

**Invasive Species Assessments**

An exotic species is defined as a species occurring in a given place as a result of direct or indirect, deliberate or accidental actions of humans. Some exotic species can be extremely disruptive which can be threatening to the survival of naturally evolved plant assemblages and individual native species. Exotic species are often major roadblocks to managing natural resources in parks and other natural areas. Managers take into account impact of the species being present or removing such species. Since resource managers face such difficult decisions, a ranking system

has been developed to sort exotic plants within a park according to the species level of impact and its innate ability to become a pest. The Exotic Species Ranking System was designed to separate innocuous species from disruptive. Drs. Vogler and Ryder collaborated on an online database that used peer-reviewed published works and the Exotic Species Ranking System to rank plants that are considered as invasive by the New York Invasive Plant Species Council. The database was upgraded to improve user access to this information. Upon completion of the database the website was offered to the National Park Service and the Natural Resource Program Center.

***Students:*** Zubaida Qamar, Kristen Conroy, Diane Herzog
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Acceptability of Cinnamon Rolls Prepared Using Okra Gum as a Fat Ingredient Substitute**

In this era of technology, it is seen that there is an increasing trend of diet-related diseases, particularly heart disease and diabetes. A major factor for the cause of these diseases is intake of unhealthy and fattening diet. One of the ways people can prevent these diseases is by incorporating healthy and low-fat items in their diet. It is a great challenge for the food professionals to create a tasty but low fat bakery product. The main purpose of this study is to discover a healthy and low fat version for a popular product, cinnamon rolls. This research will examine the different amounts of okra gum used as a fat substitute in place of butter in the filling of cinnamon rolls. In addition, this research will investigate the acceptability of cinnamon rolls using 50%, 75% and 100% okra gum in place of traditional fat, and compare the attributes such as taste, appearance, flavor, texture and overall quality to the control roll made with traditional fat. The four types of cinnamon rolls were prepared using traditional recipe and compared to each other for the attributes mentioned above. Twenty participants were invited to rate the products.

***Students:*** Corey Ranno, Michael Toomey
***Faculty Sponsor:*** Sheila Serbay (Psychology)

**Legalization of Medical Marijuana**

Americans with debilitating medical conditions do not have legal access to effective therapeutic cannabinoids due to a history of negative propaganda and a warped social understanding of the drug. Due to the rising trends of the past 15 years, we believe the use of medicinal marijuana will be legalized on a federal level for patients with debilitating illnesses. At the beginning of the 20th century, the use of marijuana was discouraged and controlled due to a rise in the Mexican population in the U.S. Throughout the remainder of the century, marijuana was portrayed as a menace to society until recent studies revealed significant medicinal uses for the drug. With the passing of Proposition 215 in California in 1996, fourteen other states have recognized the advantages of marijuana for medicinal usage. The argument for legalization on a federal level has gained momentum due to these rising trends for legalization on a state level. We believe the benefits of medicinal marijuana cannot be ignored. With the approval of a licensed doctor and distribution through an authorized facility or caregiver, marijuana can help Americans with debilitating medical conditions; legislative bodies will soon come to a conjoined consensus.

***Students:*** Corey Ranno, Austin Fox, Michael Toomey, Joe Efrein, Adam Guillaume, Rebekah Cramer, Lindsey Doxtader, Samantha Rivet, Alexis Cornell
***Faculty Sponsor:*** Lawrence T. Guzy (Psychology)

**Loudness Magnitude Matching of Salty, Sweet, Sour, and Bitter Liquids as a Function of the Number of Fungiform Papillae with Varsity Collegiate Wrestlers**

*Problem:* Wrestling is a unique sport in which a competitor must maintain his/her weight in order to wrestle at a previous trained weight class. *Purpose:* We examined whether eating habits, quality of taste perception, and number of fungiform papillae are related and do they relate to the ease of maintaining weight. *Method:* Wrestlers were recruited from the varsity wrestling team. Participants were: a) administered the Three Factor Eating Scale, which examines subcategories of Hunger, Cognitive Restraint, and Disinhibition, b) applied blue food coloring near the tip of

the tongue with a cotton swab (the tongue stains blue while the fungiform papillae do not) and the numbers of papillae were counted within a six mm circle by two independent observers looking through a six inch magnifying lens, and c) adjusted the loudness of a sound generator to match the perceived taste of independently sampled drinks that were sweet, sour, bitter, & salty. Loudness was measured with a sound pressure level meter. Each drink was presented twice using a Latin-square design.

***Students:*** Kayla Reinstein, Mallory Green, Jessica Lee
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Low-Fat Yogurt as a Fat Replacement in Pound Cake**

Fat substitutes are ingredients that resemble conventional fats and oils and can replace fat on a gram for gram basis. When incorporated into an overall healthy diet, reduced fat foods made with fat replacers can play an important role in helping consumers reach and maintain their goal of reducing consumption of dietary fat. Using a fat substitute that has many health benefits will better improve the value of the product. In our experiment we substituted the fat in pound cake, butter, with a high protein yogurt. Yogurt has many positive effects on the body. For instance, yogurt is an excellent source of protein, calcium, phosphorous, riboflavin, thiamin, and vitamin B12 and a valuable source of folate, niacin, magnesium, and zinc. We substituted the butter in increments with a control, 25% yogurt, 50% yogurt, 75% yogurt, and 100% yogurt. We tested for appearance, texture and flavor, moistness, tenderness and overall acceptability. We used surveys to test the variables. Results show that the 50% yogurt, 50% butter pound cake was most acceptable. Also, the other experimental samples were liked more than the control, demonstrating that a cake made with fat substitutes can be acceptable to consumers.

***Student:*** Tyson Robb
***Faculty Sponsor:*** Devin Castendyk (Earth Sciences)

**Green Solution to an Orange Problem: Energy-Producing Purification of Acid Mine Drainage**

I intend to investigate the feasibility of energy production through electrolysis and examine the energy output produced from different acidic solutions. This study is very important especially now that we, as a nation, are coming to the realization that there is no choice other than sustainable energy production. The process tested would use fuel cells to convert hydrogen into electricity on the premise that hydrogen may be a better way than batteries to store energy that is produced. With electrolysis and the hydrogen fuel cell, changes in acid mine drainage quality were measured. Samples of different pH concentrations were analyzed to determine if there is more hydrogen produced from acidic solutions and also to ascertain the effects on the pH of the solution, once electrolysis was performed. The pH of solutions did change, and solutions with a higher hydrogen concentrations did produce more gas. Now that the effectiveness of electrolysis has been ascertained, further research into its contributions to remediation of acid mine drainage can be explored.

***Students:*** Jessica Rodriguez, Miyeon Presky
***Faculty Sponsor:*** Jacqueline Bennett (Chemistry & Biochemistry)

**Green Synthesis of Aryl Imines**

Imines are a significant intermediate in pharmaceutical compounds such as Zetia® (ezetimibe), a popular cholesterol reducer and Taxol® (paclitaxel), a chemotherapy drug. This is due to the nitrogen double bond component present in imines. According to previous literature, imine synthesis requires copious energy for purification, and utilizes harmful methods and solvents. Using Dr. Bennett's green method, imines are produced by using minimal amounts of energy and at significant yields.

***Students:*** Jessica Rodriguez, Julie Sosenko, Christopher Schwarz
***Faculty Sponsor:*** Keith Schillo (Biology)

**Effects of Fructose on Mice Satiety**

Controlled studies dealing with the effects of dietary consumption of fructose on metabolism and growth are of mixed quality and have produced mixed results. We find it necessary that a well-designed study be conducted on a non-human model in order to control variables that have not been taken into account in these past studies. Our plan was to test the effects of fructose and glucose on satiety in a mouse model. We proceeded do this by fasting our mice for 24 hours, allowing them access to water (control group), glucose, or fructose on day 2, and allowing them unlimited access to feed on day 3. Measurements were taken of treatments ingested (fructose/ glucose), final body weight of mouse, and overall caloric consumption.

***Student:*** Cindy Sabonis
***Faculty Sponsor:*** Marius Munteanu (Mathematics, Computer Science & Statistics)

**Classification of Doubly Ruled Surfaces**

Within architecture, there are certain buildings whose construction and appearance are somewhat of a paradox. These buildings may be constructed using only a latticework of straight elements, and yet are some of the most aesthetically pleasing structures constructed. Through the exploration of doubly ruled surfaces, we investigate how certain curved surfaces are constructed using only straight lines. In addition, we investigate how any point on these doubly ruled surfaces is contained within two straight lines.

***Students:*** Jacob Sango, Christina Vogel
***Faculty Sponsor:*** Trudy Thomas-Smith (Chemistry & Biochemistry)

**Investigation of Components of Cleaning and Personal Care Products in the Environment**

Many organic compounds degrade in the presence of light. In natural waters these photochemical reactions may be facilitated by the presence of colored dissolved organic matter (CDOM). CDOM, which is present in all types of natural waters, is formed by the decomposition of plants and animals and is known to absorb light in the UV and visible ranges. When it absorbs light, CDOM produces many reactive species and therefore, has been shown to mediate many chemical reactions in natural waters and model systems. There is evidence to suggest that personal care products and pharmaceuticals (PCPPs) are present in natural waters at varying concentrations and that many of these compounds act as endocrine disruptors. The photochemical reactions of triclosan (an antibacterial agent) and ibuprofen are analyzed for wavelength and intensity of light in the presence of CDOM (in the form of humic acid). The use of high pressure liquid chromatography (HPLC) allows for a simple, sensitive, and robust analytical method for the determination of ibuprofen and triclosan in natural waters. Knowledge of the fate of these compounds in natural waters will afford a greater understanding of the need for water treatment procedures for these PCPPs.

***Students:*** Joseph Schenone, Sara Slater, Ayesha Qamar, Nickeema Cox
***Faculty Sponsor:*** Steven J. Gilbert (Psychology)

**Auto-Kinetic Suggestibility**

The auto-kinetic effect is a phenomenon in which people perceive a motionless object to be in motion when viewed in a dark room that provides no frame of reference. When the object has dynamic properties (such as an arrow), people tend to see more motion. Past studies have shown much variation between subjects in how much more perceived motion is induced by stimuli with dynamic properties. Our present study is interested in the relationship that these individual differences have with several other measurements. We hypothesized that auto-kinetic responsiveness to dynamic stimuli, field dependence, hypnotic suggestibility, and holistic (vs. analytic) thinking are all related under one hierarchical structure known as suggestibility. By measuring individual differences in all of these areas, we expected to find that people who

perceive more auto-kinetic motion in the presence of dynamic stimuli are also more hypnotically suggestible, more field dependent, and show a more holistic orientation. To measure the auto-kinetic effect, we are showing participants figures with dynamic qualities and recording their perceived motion. Hypnotic suggestibility is measured using the sway test. Field dependence is measured using the embedded figures task, and analytic/holistic qualities are measured using the 24-item Analytic/Holistic scale (AHS).

***Student:*** Erik Scrivener
***Faculty Sponsor:*** Peter Hayward (Geography)

**Exploring the Impacts of Development of the Tourist Industry on the Route 28 Corridor in Otsego County, NY**

The Village of Cooperstown in Otsego County, NY is a world-renowned tourist destination. The Baseball Hall of Fame and other museums cater to the traditional tourists that have visited the area for years. However, in 1996 the Cooperstown Dreams Park opened in the town of Hartwick, and began a growth in the number of recreational tourists visiting the area. Revenues have increased significantly in Otsego County in the form of a 12% occupancy tax, known as Bed-Tax revenues. The towns of Otsego, Hartwick, and Milford, located on the Route 28 corridor, have experienced significant growth in their Bed-Tax revenues due to their proximity to the Cooperstown Dreams Park. As the Park has expanded over the years, a number of accommodating facilities have been constructed to serve the growing tourist industry.

***Student:*** Rebecca Shea
***Faculty Sponsor:*** Paul French (Physics & Astronomy)

**Atwood's Machine Revised**

Atwood's Machine is a common physics experiment where the acceleration due to gravity is determined by timing the motion of two masses hung over a pulley. This research is an expansion upon previous research done to determine the best way to implement the experiment within the high school physics curriculum. Two methods of data collection were used: stopwatches and a photogate pulley system. These data were then analyzed using three different methods of increasing complexity. It was concluded that a light-weight, ball-bearing pulley is the best type of pulley to use. The best apparatus was the photogate pulley, yielding results that match the accepted value of the gravitational acceleration within 1.2% precision using analysis method three. This third analysis method incorporates friction and the rotational inertia of the pulley. While this method produced the best results, it is perhaps too complex for all but the most advanced classes. Method two (excluding the rotational inertia of the pulley) may be used in regular classes with adequate results.

***Student:*** Rachel Stevenson
***Faculty Sponsor:*** Jeffrey Heilveil (Biology)

**Development of Microsatellite Markers for *Nigronia serricornis* Say (Megaloptera: Corydalidae)**

Overall, this project aims to isolate and design a suite of microsatellite primers in *Nigronia serricornis* (Megaloptera: Corydalidae). Microsatellites are regions of DNA with tandemly repeated nucleotide motifs. These repeated nucleotides usually occur in the non-coding regions of the genome. They are not converted into proteins and therefore are not acted upon by natural selection. This property makes microsatellites a good evolutionarily-neutral marker so it may be readily used to determine the relatedness between individuals from two populations. Besides use in studies regarding population structure, microsatellites can also be used for forensic identification, identifying evolutionary relationships, and many other applications. This primer set will be of great value to science as the first set ever designed for the superorder Neuropterida. These newly developed primers will be tested on other members of the Order and Super-order, and will be used to examine familial relations in a group of 20 individuals collected from the Cohocton population from which the initial insect was collected.

***Students:*** Rachel Stevenson, Tami LaPilusa
***Faculty Sponsor:*** Nigel Mann (Biology)

**Does Female Attractiveness Affect Reproductive Investment and Success in Zebra Finches (*Taeniopygia guttata*)?**

Zebra Finches (*Taeniopygia guttata*) are a model species used in avian behavioral and reproductive studies. Previous research indicates that leg color banding for identification purposes can correlate with the perceived attractiveness of male Zebra Finches and can influence their reproductive input. Few studies have assessed reproductive success as a result of the perceived attractiveness of females on the basis of leg band coloration. Nevertheless, a female's self-perception of attractiveness has been shown to influence mate selection and investment in her offspring. Our study will test whether the sex-ratio of offspring and sex differences in brood care, positive bonding behavior, and aggression are affected by differential color banding of female Zebra Finches.

***Student:*** Ross Todd
***Faculty Sponsor:*** Les Hasbargen (Earth Sciences)

**GPR Stratigraphy of Fluvio-Glacial Landforms in Central New York State**

We present results on tests of the ability of Ground Penetrating Radar (GPR) to characterize stratigraphy in glacial landforms in upstate New York. GPR is a non- invasive tool which allows visualization of the subsurface. There are, however, significant constraints on GPR capabilities. The depth to which GPR can penetrate depends on the substrate electromagnetic properties of conductivity and permittivity. Changes in permittivity generate reflections, and thus materials with permittivity contrasts are ideal for reflective surveys. Highly conductive materials, however, absorb the GPR signal and limit the depth of penetration. We tested the radar in a variety of glacial depositional settings, including a kame delta, till-mantled bedrock, and outwash deposited on dead ice. We find penetrative depth is shallow. Maximum penetration depths were about 2-4 m. Within the shallow subsurface we discerned a variety of radar stratigraphic features, including continuous layers, disrupted zones, and isolated hyperbolae. Continuous boundaries often show trough-like shapes suggestive of buried channels. We interpret isolated hyperbolae as scattered cobbles within a fine-grained matrix, disrupted radar zones as cobble-rich features, and dipping layers as delta foresets. Based on initial results we hope to extend GPR surveys into a 3-d model for a clearer picture of fluvio-glacial stratigraphy.

***Students:*** Alyssa Tufano, Jaclyn Kinash, Kristine Troescher
***Faculty Sponsor:*** Charlene Christie (Psychology)

**Homogeneity vs. Diversity: The Impact of Friendship on Prejudicial Attitudes**

The study took a closer look at how homogeneity and diversity affect attitudes toward Hispanic immigrants. A second phase of this study focused on how out-group friendships influenced the impact of homogeneity or diversity messages on attitudes toward Hispanic immigrants. Results revealed significant effects regarding the homogeneity manipulation. Two main effects were revealed: Ps in the homogeneity condition viewed Hispanic immigrants as a more homogenous group and Ps in the homogeneity condition expressed less prejudicial attitudes regarding Hispanic immigrants. Results also revealed a significant main effect of friendship, with Ps who indicated having many friends within the out-group expressing less prejudicial attitudes than people who did not have many friends in the out-group. More specifically, when Ps reported not having many or any friends in the out-group, the impact of homogeneity vs. diversity was not significant. This research illustrates interesting findings regarding the capacity of friendship; individuals who are friends with members of an out-group will automatically perceive other members of that out-group less threatening despite the background information that is given to the individual regarding a particular out-group.

***Student:*** Trevor Tunison, III
***Faculty Sponsor:*** Andris Balins (Music)

**The Whole Universe and Who Cares**

*The Whole Universe and Who Cares* is the title for Trevor Tunison's debut album. The concept of the album encourages listeners to wonder about their spirituality and the energy and the power that exists in the universe. The album was recorded, produced, and mixed by Trevor Tunison. Professor Balins met with Trevor regularly to listen to the mixes of his songs and give his professional opinion about what could be changed to make them sound better. The album was recorded at SUNY Oneonta's recording studio, Trevor's studio apartment and the Baker Recording Studio. The release date for the album is May 6, 2010.

***Student:*** Sha-Qwanda Venable
***Faculty Sponsor:*** Yun-Jung Choi (Human Ecology)

**Gothic Lolita**

Upon hearing the Victorian industrial music of Emilie Autumn, I was not only entranced and captivated by her melodic melodies but also her attire. Her blend of Victorian, Elizabethan, and medieval influences into her stage wear immediately captured my attention and lead to deeper interest in her way of dress, the gothic way of dress. The gothic subculture is built on literature, movies, music, but most importantly, on aesthetics. The focus of this study was to learn about the dress of the subculture (women being my focus) and create my own garments that were inspired by the gothic subculture while learning about entrepreneurship and the starting of one's own business. The first garment made of a shiny black polyester fabric is a cap sleeve dress with a red detailed spandex waistband. The garment has a diamond shaped neckline with an inch and a half standing collar. The bottom portion of the dress forms a mermaid silhouette. The second garment is also composed of shiny black polyester fabric with a red polyester waistband. The garment is a dress with a large circular skirt and bell sleeves with exaggerated length. The neckline will heart shaped with a flat collar.

***Students:*** Travis Visco, Devon Kelley, Ethan Tierney
***Faculty Sponsor:*** Doreen Comerford (Psychology)

**Visualization of Three Dimensional Weather for the Flight Deck**

This project was undertaken by a multi-disciplinary team at SUNY Oneonta, which included students from Psychology, Meteorology, and Computer Art. Our research goal was to provide recommendations regarding the display of three-dimensional weather information for NexGen aviation flight decks, and to produce a design of the display. We identified various weather types that are hazardous to commercial aircraft, the thresholds at which the various weather types are likely to become a hazard to flight, and the manner by which this information can be displayed effectively and efficiently to the pilot of the future. The team has been coordinating activities with meteorology researchers at Mississippi State University, and will ultimately provide the recommendations to researchers at NASA Ames Research Center.

***Students:*** Ashley Wakeman, Crystal Evans, Courtney Cordero
***Faculty Sponsor:*** Gayane Torosyan (Communication Arts)

**Global Exchange: Radio/Web Dialogues**

The goal of this project is to produce and broadcast a 20-minute radio program called *Global Voices* on SUNY Oneonta's campus-based Community Radio WUOW 104.7 FM with a further analysis of program-generated web discussions. The analytical part of the project includes exploring topics in conflict analysis and transformation using reporting methods known as Peace Journalism. The theoretical framework for the project is Track II Diplomacy with its media applications. Peace Journalism is an approach proposed by Jake Lynch (2006) as an alternative to mainstream media's current, conflict-based War Journalism approach. The goal of the project is to instigate an Internet discussion on the topics covered by the 20-minute radio program and to

draw audiences into becoming part of the journalistic process in conflict resolution. We want the listeners to help set the agenda on what is discussed, and sources consulted, through conflict-related topic dialogs facilitated on a coupled website.

***Students:*** Michael Walsh, Joseph Krikorian
***Faculty Sponsor:*** Devin Castendyk (Earth Sciences)

**Geochemical Characteristics of Leachate from the Marcellus Shale, Otsego, County New York; Results of a 100-Day Laboratory Test**

The potential environmental impacts of natural gas drilling in the Marcellus Shale have caused considerable public concern in New York State (NYS). One of the principal concerns is the potential for metals to be leached from drill cuttings, and the migration of this leachate into surface water and/or shallow groundwater. The purpose of this project is to characterize the geochemistry of leachate produced from Marcellus Shale over time. Three weathered rock samples were collected from the basal layer of the Marcellus Shale exposed in a road cut along U.S. Route 20 in Cherry Valley, New York, at the northern-most boundary of the Allegheny Plateau. Samples were crushed by hand to a pebble size with a diameter ranging from 4.00 mm to 12.7 mm. X-ray fluorescence techniques identified the whole-rock composition of metals (i.e. Fe, Mn, Mg, Na, Cl, Ba, Sr, K, As, and Ca) in each sample prior to leaching. In the laboratory, 1000 mL of water was percolated through approximately 10 grams of crushed sample. The resulting leachate was collected and re-percolated through the sample once a day for 100 days at 25 °C. Water samples were collected at 25-, 50-, 75-, and 100-day intervals and analyzed for pH, electrical conductivity, dissolved metals (i.e. Fe, Mn, Mg, Na, Cl, Ba, Sr, K, and Ca) using an ICP-ES, anions (i.e. SO4 and Cl) using an adsorption spectrophotometer, arsenic using a Hach test kit, and carbonate alkalinity by titration. The mobility of metals from drill cores will be determined by comparing the dissolved concentrations to the whole-rock concentrations for each species. The dissolved concentrations will also be compared to NYS water quality guidelines to identify potential contaminants of concern associated with Marcellus Shale drill core leachate.

***Students:*** Christopher White, Katie Greico, Kaytrin Della Sala, Tyler Gore
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Oatmeal Chocolate Chip Cookies**

The purpose of this study is to see if there is a significant quality difference between the regular oatmeal chocolate chip cookies and three other sample products produced with mango puree used as a fat substitute in the cookies. This study will replace 25%, 50% and 75% of the butter with the same percentage of mango puree in oatmeal chocolate chip cookies. The oatmeal chocolate chip cookies with 100% butter will be the control group to be compared with the three sample products. A taste evaluation survey was conducted. Twenty-five students were invited to participate in the taste survey. The taste (mouth feel), texture, color, flavor and the overall acceptability of the cookies were evaluated using the Five-Point Likert Scale. This research may contribute to the techniques of healthy cooking.

***Student:*** Crystal Wiles
***Faculty Sponsor:*** Florian Reyda (Biology)

**An Investigation of the Gregarine Parasites of Damselflies and Dragonflies in Otsego County, NY**

The gregarine parasite has a rich species diversity due to their host specific nature (Janovy and Roberts, 2005). Little is known about how many different gregarine species exist in the United States because many insects species have not been examined for parasites. In fact, no studies have been done in the Northeastern United States. This survey of the gregarine parasites of dragonflies and damselflies was conducted at the SUNY Oneonta Biological Field Station in Otsego County, New York. Sampling was done using aquatic and aerial bug nets to catch both the larval and adult stages of the odonata. The dissections were done by dragging the gut of the insects across a slide and then teasing the gut apart to look for parasites. Any gregarines found were stained with

Semichon's Carmine Stain, dehydrated, made transparent in xylene, and mounted in Canada balsam. Approximately twenty-one different dragonfly and damselfly species were encountered. Previously described species and some possible new species of gregarines were found in the dragonflies and damselflies. The findings of the survey show that more research is needed to be done to better understand the gregarine diversity in the dragonflies and damselflies of Otsego County.

***Students:*** Michael Williams, Christopher Coradini
***Faculty Sponsor:*** Shih-Ming Hu (Human Ecology)

**Acceptability of Cannellini Beans as a Fat Replacer in Carrot Cake**

Currently 67 percent of the American population is overweight or obese. An effective measure in addressing this concern may be in reducing the fat and caloric content of high fat foods, while still maintaining quality. This single-blind study tested the acceptability of a high fat carrot cake prepared with cannellini beans as a fat replacement. Four carrot cakes were prepared with different ratios of fat replacers (cannellini beans /vegetable oil): 25/75, 50/50, 75/25 and 0/100 (control). Acceptability was determined by quality characteristics of mouthfeel, flavor, texture, appearance and overall quality. Participants (n=49) ranked these characteristics using a Likert scale of 1–5 (lowest to highest). The study found high levels of acceptability in all fat-replaced cakes. Compared to the control, the cake with 25 percent cannellini beans ranked higher in all quality characteristics. In all fat-replaced cakes, the texture, appearance and overall quality ranked equal or higher than the control. Nutrient analysis of each cake found that replacing fat with cannellini beans lead to decreases in fat, saturated fat and total kcal, while increasing fiber, carbohydrates and protein content. The increased nutritional quality coupled with increased quality characteristics makes cannellini beans an ideal replacement in carrot cakes.

***Student:*** Amanda Willsey
***Faculty Sponsor:*** Dona Siregar (Economics, Finance & Accounting)

**The Effects of the 2007-2009 Financial Crisis on U.S. Corporate Debt Structure**

This paper seeks to investigate the changes in corporate debt as a result of the 2007-2009 financial crisis. In normal economic times, firms may make decisions for debt financing based on a series of factors. Assuming that changes in corporate debt structure can be seen as a result of the financial crisis, what were firms' motivations in initiating these changes? This paper will focus on the liquidity risk and signaling hypothesis, and, in part, determine if either or both of these theories held true during the crisis.

***Student:*** Randall H. Wilson
***Faculty Sponsor:*** James Ebert (Earth Sciences)

**Unconformities and Stratigraphic Relationships Within the Manlius Formation (Helderberg Group) of Central New York State**

Correlation in the western Helderberg outcrop belt has clarified stratigraphic relationships within the Manlius Formation (Fm). The Minelot Falls Unconformity marks the contact between the Thacher Member (Mbr) of the Manlius and the underlying Rondout Fm. However, at Skaneateles Falls, the Elmwood C Mbr. rests on the Rondout via onlap. The Clockville Unconformity at the top of the Thacher and the overlying Green Vedder Mbr. are correlated westward, nearly to the limit of the outcrop belt. Tracing of the Olney Mbr. has revealed that it does not grade into the Dayville Member; instead it is unconformably overlain by the Dayville. Therefore, strata previously assigned to the Olney east of Manlius, NY are actually Dayville. The Elmwood rests on an unconformity that progressively beveled older units westward. Rickard's (1962) "undifferentiated Elmwood" is now recognized as uppermost Dayville. The base of the overlying Clark Reservation Mbr. (CR) is also unconformable and numerous bored hardgrounds indicated condensation in the unit. A sub-Jamesville unconformity truncates CR, Elmwood and then the uppermost Dayville before it is cut by the descending Howe Cave Unconformity. These

relationships further emphasize the need to reassign the Dayville Mbr. from the Coeymans to the Manlius Fm. (Ebert and Matteson 2003). An expanded version of this abstract was published by the Geological Society of America, following presentation at the combined meeting of its Northeast and Southeast Sections in Baltimore, MD.


Grants Development Office
SUNY College at Oneonta
Morris Conference Center
Oneonta, NY 13820
Phone: 607.436.2632
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