UGRC Program 2010

POSTER SESSION
Austin North Foyer
4:30 PM

Meesha Ard Geology

Petrology and Geochemistry of Basaltic Pillow Lavas in Teton Canyon, Idaho, U.S.A.

Basalt pillow lavas are well exposed near the mouth of Teton Canyon, Idaho, U.S.A., where they overlie Huckleberry Ridge Tuff. Basalt outcrops occur on the south canyon wall and consist of three successive columnar-jointed flows, each of which has a zone of pillow lavas at its base. The pillows are as large as 0.5 m in diameter, and the total basalt section is ~25 m thick. The flow originated from one of several of the shield volcanoes on the Rexburg Bench, south of Newdale, Idaho on the southeast margin of the Snake River Plain. We propose a model for formation of the pillow lavas similar to that described by K. Hamblin (1994) for pillow lava formations in the Grand Canyon, Arizona, U.S.A. Three basalt lava flows entered the paleo-Teton Canyon from the south. The flows dammed the river and formed pillows as they entered the ponded water upstream of the dam. Each flow added to the height of the dam. Superposition of the three flows indicates that the intervals between flows were not long enough to allow significant down-cutting by the river. Absence of basalt outcrops on the north side of the canyon indicates that the river eventually breached the dam on that side, where the lava flows made contact with the more easily eroded Huckleberry Ridge Tuff.

Daniel W. Little Geology

Identification and Correlation of Precambrian Fluvial Units in the Southern Beaverhead Mountain Range, Idaho

Geologic mapping in the southernmost Beaverhead Mountain Range of central Idaho has revealed a previously undescribed unit. Based on stratigraphic position, earlier reconnaissance mapping in nearby areas has suggested a Precambrian age with correlation to either the Wilbert or the Swauger Formation. Another report refers to similar exposures as “unnamed Cambrian.” As part of this study, a reference section was measured in Pierce Canyon along the western flank of the southern Beaverhead Range and visually compared to type localities for the Wilbert, Swauger and other formations located in the Lemhi Mountain Range to the west. Comparison was also made to the Cambrian Flathead Sandstone found in the Teton Range to the east. Correlation to the Wilbert and Swauger Formations was dismissed, as these units are lithologically dissimilar to the section in Pierce Canyon. The Flathead Sandstone was also ruled out, as no other known Cambrian outcrops are found in the Beaverhead or adjacent mountain ranges and the unit in question appears to have been subjected to significantly deeper burial. A better match for the Pierce Canyon exposures appears to be the Gunsight Formation, found on the western flank of the southern and central Lemhi Range. Both units consist primarily of reddish, cross-bedded sandstone (now more of a quartzite) in fining-upward successions with scattered thin lenses of mudstone (now slate). Differences in overall bed thickness and grain size may be lateral facies variations. Additional sections will be measured in both localities and combined with a petrographic analysis to determine potential correlation.
Controls of Woody Debris Orientation in Meandering Fluvial Systems
Woody debris (WD) located along the Henry’s Fork of the Snake River, Madison County, Idaho were examined by measuring long-axis orientation in relation to stream flow direction, in order to test the popular hypothesis that fossilized WD record paleocurrent attitudes in fluvial deposits. This hypothesis has recently been challenged by a number of researchers. Results from published studies are inconsistent, indicating perpendicular, parallel, or no preferential orientation depending upon the study. This study takes a new approach, including data accounting for debris shape and position within the river channel. It identifies controls for WD orientation and provides an accurate means for interrupting flow direction from preserved WD in meandering fluvial systems.

Petrology of the Igneous Rocks of Sawtell Peak, Idaho
Sawtell Peak, which is 3,007 m high and rises ~1,100 m above the surrounding valleys, sits near the Continental Divide on the Idaho-Montana border. The peak and surrounding area is comprised of at least 24 km$^3$ of Eocene shoshonite aa lava flows (at least 350 m thick) that overlie local Paleozoic strata and are cut by feeder dikes. The Huckleberry Ridge Tuff (2.1 Ma), from the nearby Yellowstone Plateau volcanic field, onlaps these rocks at lower elevations. Because these rocks are located between the Absaroka (to the east) and Challis (to the west) volcanic fields their petrogenesis may yield useful insights into the Eocene petrotectonic history of western North America. The volcanic features, petrography, and composition of the Sawtell Peak shoshonites are remarkably uniform throughout the section. The aa flows are 1-10 m thick and are composed of a thin lower rubble zone, a dense interior, and a thick upper rubble zone. Where slopes are steep the cross section of individual flow lobes are exposed. No pyroclastic rocks or lahars were observed. In a very few locations the flows are separated by small, thin (<3 m) sedimentary deposits. In some locations the sediments show clear bedding structures and appear to have infilled the rubble zones. In other locations the sedimentary deposits are matrix-supported and contain abundant, highly angular, weathered shoshonite clasts (<1 m). The lava flows are cut by linear, 1-2 m thick feeder dikes. Some dikes have chilled margins and others are surrounded by zones of hydrothermal alteration. Surface exposures of dikes are 10-100 m long. The flows are sometimes vesicular or amygdaloidal, are crystal rich, and contain euhedral cpx phenocrysts, commonly-altered ol phenocrysts, and microlites of plag and Fe-Ti oxides. Modal proportions are: 61-69% matrix, 22-34% cpx, 5-12% ol. Two units (one flow and one dike) were observed to contain biotite. The rocks are uniformly shoshonitic (K$_2$O 2-5%), silica-oversaturated, magnesian, and calc-alkaline. Major (in wt. %) and trace element (in ppm) variations are relatively small, e.g., SiO$_2$ varies from 51.6-54.5, MgO from 5-9, TiO$_2$ from 0.7-0.8, Cr from 274-417, Ni from 54-106, Rb from 54-199, Sr from 412-799, Ba from 1389-1774, and Zr from 72-129. Major and trace element compositions suggest that 1) Sawtell Peak rocks erupted during (at least) three eruptive episodes, 2) Sawtell Peak rocks are compositionally similar to the mafic rocks of the Absaroka Volcanic Field (likely because they are part of the that field), and that 2) their origin included a significant subduction zone compositional component (likely from the subduction zone that existed beneath western North America during the Eocene).
Zachary Vineyard  
*Geology*

**Mapping the Ashton, ID Aquifer with Geographic Information Systems**

Sampling and testing of private and public wells in the Ashton, ID region shows many wells exhibit high levels of nitrate exceeding the EPA’s Maximum Contaminant level (MCL) of 10 mg/l nitrate as total nitrogen. The mechanism for the observed distribution pattern for impacted wells is not presently understood. In some cases, uncontaminated wells were observed in close proximity to contaminated wells. In an attempt to better understand nitrate distribution, a water-table map of the aquifer is generated. The map is based on water level information on driller’s well logs. These logs provided static water level depths below the land surface. Those depths were then adjusted for the well sites elevation to determine the water table elevation relative to sea level. The data was clustered into four groups, each covering a three-month period to determine if any seasonal variations could be observed. Kriging and Inverse distance contouring tools in ArcMap were used to create the filled water table contour map. These maps can then be used to increase our understanding of direction of flow in the subsurface to help study observed well contamination levels.

Daniel W. Little  
*Geology*

**Reinterpretation of Compressional Structures along the Western Margin of the Southern Beaverhead Mountain Range, Idaho**

The BYU-Idaho Advanced Field Methods course has conducted mapping exercises in the southern Beaverhead Mountain Range for the past several years, resulting in the map shown in this poster. Additional mapping has been done by other workers, with little agreement between the various interpretations. This past summer’s research by BYU-Idaho focused on refining earlier maps and, in the process, discovered previously unknown structures along the western flank of the range. Details of these structures are illustrated by photos and diagrams. Further research, including detailed field surveys, will be performed to better refine structural details of the range, with the ultimate goal of reconciling differences between past and current mapping.

David A. Little  
*Geology*

**Reevaluation of a Devonian Paleochannel Deposit, Central Lemhi Mountain Range, Idaho**

An unnamed Devonian unit near the head of Spring Mountain Canyon in the Lemhi Mountain Range of Idaho has previously been interpreted as a paleovalley fill comprised of sandstone, conglomerate, and shale. This interpretation was based primarily on a distinctive lens-shaped outcrop. However, further investigation suggests that the apparent channel shape is actually the result of a series of tear faults in steeply dipping strata along the eastward limb of a plunging anticline that now forms part of a cirque, and that the unit is comprised mostly of sandy dolomite. Evidence for a tectonic interpretation includes a planar lower contact with the Laketown Dolomite that shows a stair-step offset pattern and a vertical lateral contact with the Laketown at the southern end of the outcrop. Additionally, the unit is not restricted to the apparent channel exposure, but is consistently found stratigraphically between the Laketown Dolomite and the Jefferson Formation throughout Spring Mountain Canyon.
**POSTER SESSION**

*Austin North Foyer*

4:30 PM

Jaren Olsen  
*Physics Education*

**Physics Education Research – Physics 105**

This poster outlines the results of a diagnostic test given to Physics 105 students at the beginning and end of the class. Using statistical comparison methods such as the t test, it is shown whether factors such as gender, previous math experience and whether the class is required for the student's major affect a student's attitude toward physics. Also, the effect of the Physics 105 class itself on attitude toward physics can be seen by the comparison of the pre-test with the post-test.

Nathan Maughan  
*Mechanical Engineering*

**Duct Temperature Rise Analysis**

JBT AeroTech requested a heat transfer analysis be performed on their current air conditioning duct which runs from their mobile cooling unit to the aircraft. The main objective of this analysis was to begin to understand key factors which affect the temperature rise within the duct and then to develop a model which accurately captures the effect of those factors. An error analysis was to be performed by comparing the values produced by the theoretical model and the experimental data. It was determined that there are numerous factors which affect the temperature rise within the duct. These factors include solar radiation, internal convection, conduction through the duct walls, external convection, and external condensation. Furthermore the duct has certain material properties which also play an important role affecting the temperature rise. These material properties include duct length, wall thickness, and the thermal conductivity of the duct material. After analyzing and modeling all of these factors, it was determined that external condensation, if present, has the greatest impact of the temperature rise within the duct. In addition to these findings it was determined that an small increase in the duct wall thickness or a small improvement in the thermal conductivity of the duct material greatly reduces the amount of condensation which occurs.

Tyler LeBaron  
*Exercise Physiology*

**Alkaline Water Enhances Time to Exhaustion during Lactate Threshold Running**

Alkaline reduced water produced through electrolysis has been approved by the Japanese Health and Welfare for its various health benefits. There is also anecdotal evidence that this same water augments athletic performance, but no double blind placebo test has validated this claim until now. This study determined the affects of drinking alkaline reduced water (ARW) on time to exhaustion (TTE) during individual lactate threshold (ILT) running. The ARW, pH 9.90± 0.05, was compared with placebo, tap water (TPW), at a pH of 7.00 ± 0.05. The study consisted of 9 subjects randomly assigned to the placebo or ARW group. Five of the subjects received the ARW for the 1st test, and the other group received the placebo for the first test, then switching for the final test. In the test they ran at (ILT) on a treadmill at a 1% incline to find TTE. ARW group was significantly greater compared to Placebo group showing an average increase in TTE of more than 1 min 30 seconds. The ARW proved to have an ergogenic effect, mostly attributed to reduction of metabolic acidosis, due to the increased glycolytic flux during the run at LT; however, because other supplements used to reduce H+ concentrations (I.E. Na₂CO₃, Beta-Alanine, creatine, etc.) fail to show improvements of ILT or TTE at this distance, it is inferred that there must be another factor involved that needs further research.


**POSTER SESSION**

**Austin North Foyer**

4:30 PM

Heath Dewey  
*Biology*

**The Effects of Doxorubicin (DOX) Treatment on Calcium Cycling Proteins of the Sarcoplasmic Reticulum (SR) in Cardio Myocytes**

Two groups of rabbits were raised for this experiment, one control group and a DOX treatment group. Heart tissue was collected and the SR was isolated from the samples. The protein content of the samples was analyzed by sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), transferred to a nylon membrane and then treated with a Western blot to probe for the proteins of interest. The main proteins involved in calcium cycling are the Ryanodine receptor (RYR), the SERCA2 pump and phospholamban (Plb). Upon analysis of the gels, it was shown that function of the calcium cycling proteins was decreased with DOX treatment. An unidentified protein complex was also identified. Future experiments may analyze this complex using Blue Native PAGE.

Ryan Evans  
*History and English*

**Alien Abductions: A Study of Testimony and Physical Trace Evidence**

This presentation is based off of a paper I wrote for a Senior Seminar on Ufology, or the study of the UFO movement. I determined to write an objective historiography about purported alien abductions because of its controversial nature, and to see if there was any credence at all to the numerous claims out there. I used a number of websites to research supposedly legitimate cases, and specifically studied 100 cases. The results were not what I would have thought, being a debunker myself, but rather indicated that there are a series of markers pointing to a need for closer examination. I found that there were commonalities between many cases, which are listed as follows: Scars and Marks, Lost Time, and Implants. I also address the use of regressive hypnosis as a form of evidence. Through this evidence, and the arguments of both skeptics and believers alike, it became apparent that abduction is a field that warrants further investigation.

April McKenzie  
*Psychology*

Cassie Luthy  
*Psychology*

**The Effects of Resources on Self-esteem in College-aged Women**

One issue that many assume to be important in predicting future success in America’s young adults is their level of self-esteem. Since self-esteem suffuses many aspects of a girl’s life, it seems only logical that self-esteem would correlate with other variables that we will call “resources.” This research seeks to understand what those resources are and how they influence a girl’s self esteem. A survey was sent out to 700 randomly selected single girls at BYU-Idaho regarding the following factors: monetary availability, time spent shopping, hours spent on one’s appearance, perceived popularity, social satisfaction, opposite sex relationships, and the value placed on appearance. Social satisfaction was the only resource that directly correlated with self-esteem. Later, five of the girls surveyed were randomly selected to participate in an interview, and an exhaustive description of common themes was developed. Some of the factors that continually showed up were the ability to change one’s situation, independence, one’s social life, and religion. Some future implications regarding differences in age groups, demographics, and changes over time would be valuable for future investigation.
POSTER SESSION
Austin North Foyer
4:30 PM

Allison Coltes  Psychology
Juan Hernandez  Psychology
Racheal Michela  Psychology
Nathan Tolley  Psychology
Elizabeth Brutsch  Psychology
Tommi Williams  Psychology
Jacob White  Psychology
Marcos Sanchez  Psychology
Holly Anderson  Psychology
Nathan Bodily  Psychology
Will Taylor  Psychology
Steven Jenkins  Psychology
Michelle Hudson  Psychology
Kyle Spaulding  Psychology
Kristen Knecht  Psychology

Diagnostic Classification of Autism by Gross Morphology of Heschl’s Gyrus Using MRI Scans

Language and communication disturbances are common symptoms of autism. One brain area that could relate to this problem is Heschl’s gyrus (HG), a structure located in the superior part of the temporal lobe that contains the primary auditory cortex (PAC). The PAC is involved in the analysis of spoken language and sound. The morphology, or structure, of HG can vary: most commonly, it appears as a single gyrus, but occasionally it splits either partially (common stem duplicate) or completely resulting in two gyri (complete posterior duplicate). Such morphological differences have been linked to dyslexia as well as language disturbances in neurofibromatosis type-I. Despite these known differences in dyslexia and neurofibromatosis type-I, to our knowledge no research has been conducted linking the morphology of HG to autism. We hypothesized that there would be differences in the morphology of HG in autistic children compared to controls. Utilizing methods similar to those of Abdul-Kareem and Sluming (2008) to define HG, we analyzed T1-weighted MRI scans of 60 subjects (30 controls and 30 subjects with autism). Our subjects were matched for gender, handedness, and age. A multinomial regression analysis showed that there are no significant morphological differences in HG for controls compared to subjects with autism. We conclude that the brains of autistic subjects cannot be differentiated from controls based on the gross morphology of Heschl’s Gyrus.
Institutional Value Change in the Transition from Ricks to BYU-Idaho: A Qualitative Study

BYU-Idaho has undergone significant changes since its transition to a four-year university. The purpose of this study was to assess whether values have changed in this transition. Three participants were interviewed in the study: a current student body officer, a former student body officer at Ricks College, and a current BYU-Idaho professor who had taught at Ricks College. The apparatus of the study was the interview process, utilizing digital recorders and Microsoft Word. We found that values have significantly changed in the transition, from being more relationally-oriented to more growth-oriented. Future research should focus on whether integral values have been changed or if only the periphery has been modified. Also, generalizability should be increased.

Effectiveness of Persuasive Techniques

Persuasion is a powerful and often implemented tool in business, ethics, advertising, personal values and many other areas. There are so many opposing views vying for attention and support that as consumers of ideas, people can often be led astray with sly arguments. This study examines effectiveness of differing appeals. It studies emotional and ration appeals. It also makes a distinction between positive emotional appeals and negative emotional appeals. University students are exposed to one type of appeal concerning a specific ethical dilemma. They are shown a tape in which a speaker argues for or against the point, relying on one of the types of appeals. This qualitative study attempts to show why some appeals might be more effective than others when trying to persuade.
The Tragic Hero as a Faith Device

Historically the pre-Christian western tragic hero has worked as a device to achieve catharsis in an emotionally cleansing sense. This is how the tragic hero has been interpreted almost universally, but it almost completely disregards one of the most important ways in which the tragic hero functions—as a device to increase faith in a savior figure. This study attempts to examine how the tragic hero device functions in a post-Christian western cultural context by analyzing how the tragic hero has been used and interpreted historically and then looking at the evolution of the device in literature. I make the argument that the post-Christian western cultural tragic hero is a type for the fallen man and works as a faith device to bring people closer to Christ. This knowledge will help readers discover insights into Christian theology as they study tragic hero literature, thereby strengthening their faith in Christ and their understanding of how Christianity is reflected in the cultural underpinnings of society.

“No, My Brutus”: Angels Changing their Stars in Shakespeare’s Julius Caesar

William Shakespeare’s numerous plays abound with accounts of female characters whose behavior and eloquence speak volumes regarding the nobility Shakespeare ascribes to women. Through my research, I intend to 1) investigate the critical dialogue surrounding Shakespeare’s ideas about women, 2) impose those ideas onto the women—Portia and Calpurnia—in Julius Caesar, and 3) demonstrate their ineffective efforts to obtain control over their separate destinies as women and wives to two of the most influential individuals in Rome. Shakespeare, like so many well-meaning authors, unintentionally propagated angelic stereotypes by attempting to portray the female characters in his works as pure, chaste, and strong. In this regard, Sandra Gilbert and Susan Gubar, two twentieth-century feminist theorists, have proposed that women in literature have often been classified as either angels or monsters, both titles tending to encourage the idea of feminine weakness, inferiority, or undesirability. In Julius Caesar, we find two victims of the angel stereotype who see the negation of their femininity as the only way to change their situation. However, their efforts to gain control of their fate, they having realized—like Cassius—that “the fault…lies not in our stars but in ourselves,” terminate with the death of Portia and Calpurnia ineffectiveness as a savior to Caesar. Portia’s death and Calpurnia’s impotence indicate a certain type of fate for those who, by seeking to improve a debilitating situation by adopting an identity not their own, lose themselves completely in the process.

Sign and Subject: Revealing Objectified Relationships in Sense and Sensibility

This essay explores objectified relationships in Jane Austen’s Sense and Sensibility. It argues that neither sense nor sensibility is favored in the novel, but rather that Elinor and Marianne are equally subject to society because of their social aspirations. These aspirations cause Elinor and Marianne to objectify the men in their lives, and sense and sensibility are both tools that they use to objectify men. The essay builds on feminist remarks, and rebuts the assertion that sense is the condoned virtue in the novel. Jean Baudrillard’s theory of object sign value will be used to explore Elinor and Marianne’s objectification of men.
**J. Rebecca Smith  English**

**Eliot’s Beckett: Martyr or Megalomaniac?**

Thomas Beckett believed he was the Savior. Or at least, so T.S. Eliot would have us suppose in his play “Murder at the Cathedral”. Although hagiographers have stated for decades that Eliot’s portrayal of Beckett was a spur to incite religious fervor, especially for his sainthood, I argue that Eliot’s purpose was quite the opposite. Through Eliot’s portrayal of Beckett, the Archbishop emphasizes similarities between himself and Jesus Christ throughout the play. This is most evident when the Fourth Tempter enters in Act I. Beckett is astounded and claims he expected three visitors, not four. The inference is clearly drawn that Beckett believed his experience to be parallel to Christ’s when being tempted by Satan. According to the book of Matthew, Jesus Christ was only tempted three times by the devil. Beckett, thinking himself equal to the Son of God, anticipated the same, but was surprised when presented with a fourth. The Fourth Tempter then exposes the secret desire of Beckett to be sacrificed in the same manner that Christ was. Beckett believes his mission is the same as Christ’s—to sacrifice himself. Eliot, through this marked difference, was challenging views of sainthood. Although not attempting to justify the King, Eliot was defiantly exposing Eliot for exactly what he was: a man.

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**Jamie Goodwin  English Education**

**Re-framing Narrative to Overcome Racial Stereotypes in August Wilson’s *Fences***

Prior to the Civil Rights Acts of the 1960s, African American individuals were legally free but continued to experience hate crimes, mob ruling, and Jim Crow Laws. Working to overcome racial prejudice and the myriad of African American stereotypes, Troy Maxson, in August Wilson’s *Fences*, works to change common misconceptions of African American men through reframing his stories to alter himself from the victim to the victor. I argue that Troy counters cultural stereotypes in society to show strength and humanity through rewriting oral narratives, altering the meaning of songs, and using improvisation to overcome barriers in his life. August Wilson stated, “If black folks would recognize themselves as Africans and not be afraid to respond to the world as Africans, then they would make their contributions to the world as Africans.” My research synthesizes ideas of Troy working to find his identity amongst white society by turning to his roots, and the idea that by reframing his stories allows Troy to show how he can contribute to the world in his own way and overcome stereotypes of African American men.
Investigating Proficiency Gains of Students in the Chinese Language Minor at BYU-Idaho

The purpose of this study is to measure and investigate gains in Chinese language proficiency by students in the Chinese Language Minor at BYU-Idaho. More specifically, this study compares the listening comprehension and reading ability of 200 and 300 level Chinese speaking returned missionaries (RM) with those students who began their study here on campus at the beginning level (non-RM). The data collection tool used is an internationally recognized proficiency exam called the Hanyu Xueping Kaoshi (HSK). The researcher utilized an unofficial practice version of this exam, but modified it so students could complete the exam within a 60-minute class period. The exam consists of a listening portion with 29 questions based on a passage that either describes a picture or a dialogue between two people. The reading portion contains 37 questions consisting of cloze-type fill-in-the-blank sentences and general reading comprehension passages. All exam questions are multiple-choice which require the participants to record their answers on an answer sheet. Data is being collected in four intermediate level Chinese language courses here on campus. During the first week of each semester, data is collected from the CHIN 201 and 301 classes. At the end of the semester, data is collected using the same procedure from the 202 and 302 classes. This allows the researcher to measure proficiency gains over the 200 and 300 level courses. The first round of data was collected in the fall semester of 2009 and will continue in future semesters. The data that has been collected so far is being used to see if significant differences exist between a variety of variables. The following means will be calculated: overall class averages, RM averages within classes and non-RM averages within classes. The following relationships will also be tested to see if significant differences exist between groups: classes of same level (ex. beginning 200/300 level with completed 200/300 level), same class at different semesters, beginning 200 level with completed 300 level and RM with non-RM in same classes. Results of the above analyses are currently underway and will be completed by the time of the conference presentation. These results will be used as part of an internal review of the objectives and outcomes of the Chinese Language Minor. Additionally, other proficiency measurement tools will be reviewed as part of an ongoing project to improve the effectiveness of learning and teaching Chinese here on campus.

Growing Up Huck: Comparing Buck’s Naivety to Huck’s Growing Maturity

Mark Twain’s *Adventures of Huckleberry Finn* has been discussed as a coming of age story as well as a controversial story. Many scholars argue that Huck Finn’s story is lacking in evidence of Huck’ growth, while others argue the opposing view. Is *Adventures of Huckleberry Finn* just a book about a young boy’s adventures? Does Huck really grow mentally despite Twain’s unusually happy ending? The object of my argument is demonstrate that Twain purposely added the character Buck Grangerford to his story in order to establish a comparison between Buck to Huck. The fact that the boys have such similar names and ages indicates that they are supposed to be compared. By comparing the two boys, Buck’s ignorance and naivety accentuates the growing maturity level of Huck Finn. Because Buck is so unaware of the realities of life, Huck’s character questions him and in turn learns and grows more as an individual. My analysis of research and textual evidence shows that Huck’s small change in maturity and expansion of individualism illustrates that life without progression becomes meaningless.
Censoring the Right to Speak

The battle against censorship is one that is long lasting and extremely prevalent today in education. My research paper explores the argument against censorship in the education system; particularly involving the book *Speak*, written by Laurie Halse Anderson. Censorship shelters young adults from knowing about real, hard pressed issues in the world; issues such as sex, rape, and drugs. By censoring books that deal with hard topics and issues, we are denying youth the opportunity to exercise their free will in choosing and practicing their personal morals and beliefs. Young adults cannot learn what they personally will and will not tolerate in their reading if censorship keeps them from reading about controversial topics. Reading about these subjects in the classroom is a safe way students can explore deeper into these topics without going into the real world and experiencing them firsthand for themselves. *Speak* has received both positive and negative feedback since its publication in 1999. My argument is that *Speak* should not be banned or challenged for its topic of rape. *Speak* is an empowering novel that focuses on the repercussions of silencing ourselves against evil in the world, and it focuses on the ability to overcome those evils. *Speak* has inspired thousands of people to speak up about their personal suffering and see the book as an encouragement to heal. Why keep young adults in the dark, and why deny them the opportunity to learn and grow from someone else’s positive inspiration? Young adults can learn several lessons from this book and be influenced and empowered for the better from it; if only we would let them read it.

The Deadly Disease: The Need for Assimilation in Willa Cather’s *My Ántonia*

The Deadly Disease: The Need for Assimilation in Willa Cather’s *My Ántonia*

Willa Cather once suggested that assimilation in America amounted up to a “deadly disease”. Tim Prchal, a Cather critic, argues that Cather in her novels “manipulates” negative stereotypes of immigrants, specifically those of Czechoslovakian and Eastern European origin, into images that promote Cather’s “vision” of a nation where homogeneity is not a requirement for success in America. Such a “vision” suggests that assimilation is unnecessary and that, in fact, immigrants ought to retain their “ethnic distinctiveness” while in America. Prchal demonstrates how Cather illustrates certain Czech characters in *My Ántonia* to make the idea of a “pluralistic society” more appealing to her readers, thus promoting her anti-assimilation ideals. I argue that Willa Cather’s novel *My Ántonia* refutes any disposability of assimilation and in fact shows that assimilation is necessary for success in America. I do this by examining the development of two figures, Antonia Shimerda and her father, Anton Shimerda. Ántonia’s cultural assimilation leads, ultimately, to her emotional and physical success, while Anton’s lack of emotional assimilation and his inseverable ties with Old Bohemia lead to his failure in America, as evidenced by his suicide. By examining these two characters and their respective success or lack thereof, I argue against Cather’s claims to advocate heterogeneity in America and Prchal’s argument that her novels reflect her supposed ideological stance.
ORAL SESSION: LANGUAGES & LETTERS
Austin 210
7:15 PM

Jessica Graff English Education

Women and Chicks: The Similarities Between Molly and Em’ly in The Virginian by Owen Wister

The characters of Em’ly and Molly share many common characteristics and these can be seen throughout Owen Wister’s book, The Virginian. Wister created Em’ly’s character as a chicken, rather than some other barnyard animals, to better signify the correspondence between the two women. I plan to show the similarities between Molly and the chicken, Em’ly, though a word analysis of the word “chicken”, the symbolism associated with chickens and by stating the similarities between the two characters. I will prove that the two characters are mirror images of one another and that through the use of these two characters, readers are supposed to realize that the rejection of true womanhood is detrimental to both the women themselves and to society. Owen Wister uses the chicken figure of Em’ly in The Virginian in order to demonstrate particular things that women should not be and characteristics that they should not have. Em’ly’s outer appearance is almost like that of a man, awkward and bulky. She refuses to allow herself any intimacy with the rooster and therefore cannot have children, but instead steals them from others. While she has escaped the motherhood part of her contribution to society, her still being a woman causes the natural instinct to care for young to overpower her rejection of dependence on man. Molly holds many of the same stigmas as that of Em’ly and it would seem that the two could be representations of one another. Molly is very much like Em’ly, having rejected the idea of having to give up her independence to a man, moving out West to care for other’s children under the title “Schoolmarm” and by stopping out of her socially accepted gender roles to work for money instead of being a housewife. These two womanly figures have much in common and are meant to be compared and talked about as models of each other. Discussing how both women reject their stereotypical, womanly roles it can be seen that rejection of such an important contribution to society can be near fatal, literally or figuratively.

7:30 PM

Josh Petersen Communication

The Purpose and Meaning of “The Book of Life:” An Exegetical and Etymological Theory

In the scriptures the oft referenced “Book of Life” has been the subject of much speculation throughout interpersonal discussion, talks and published works. This thesis has been developed from etymological analysis and exegetical studies from the standard works. The thesis is also validated by Near-Eastern scholarship. This research provides the framework for a specific and coherent theory of the use and purpose of the Book of Life.

7:45 PM

Rebekah Teranobu English

My Blood was Full of Them: The Sacrifice of Passion in Elizabeth Bishop’s “Crusoe in England”

This paper will focus on Elizabeth Bishop’s usage of imagery in her poem, “Crusoe in England.” It will especially focus on the usage of volcanoes, the color red, and goats. By examining these images, it will shed light on how the poem is about Bishop’s journey of sacrificing passion to become Christ-like.
Nathan Vasher  
*History*

**Reexamining Rwanda: What Can the International Community Learn from Rwanda?**

Acts of genocide raise two crucial questions: 1) what is the proper role of the international community to stop crimes against humanity, such as genocide? 2) do the national interests of developed countries override the human security in the developing world? The international community answered both of these questions following World War II with the enactment of Convention on the Prevention and Punishment of the Crime of Genocide in 1948. However, during the Rwandan genocide the international community failed to protect the people of Rwanda because of national interests. Due to this failing, individuals acted to save hundreds if not thousands of lives. This examines the role individuals played in preventing genocide in Rwanda. Individuals played a bigger role in stopping the genocide than did the international community. The international community can learn the following lessons from these individuals: 1) the international community can prevent slaughter merely by their presence as in the case of Carl Wilkens 2) fear cannot drive action 3) the responsibility to protect is a moral obligation as argued by Dallaire 4) people on the ground make more of a difference than first assumed.

Lyle H. Hamblin  
*History*

**Differences in Expressed Ideals of Women’s Gender Roles: A Comparison of Statements Made by Brigham Young and Spencer W. Kimball**

The presidents of the Church of Jesus Christ of Latter-day Saints occasionally give prophetic council to the members of the Church pertaining to the gender roles of men and women. Both Presidents Brigham Young and Spencer W. Kimball were prolific in issuing prophetic counsel to women. This paper compares different descriptions of the ideal role of LDS women as described by Presidents Young and Kimball; giving minimal historical contextual interpretation provided by secondary sources. Primary research included comparing sermons, statements, and books authored by the two presidents. This paper concludes that changes in the expressed ideals of women’s role between Brigham Young and Spencer W. Kimball can be seen in four areas. First, statements concerning the necessity of women’s involvement in work outside the home have changed. Second, emphasis on the importance of motherhood has increased. Third, the equality of the roles of men and women is clarified. And finally, descriptions of certain parts of women’s spiritual role in the family and in the Church have changed. This paper can assist any research that pertains to the roles of women in the Church, or the patterns in prophetic council.
ORAL SESSION: HISTORY & POLITICAL SCIENCE

Austin 127

7:00 PM

Nathan Vasher  

History

State Centrality and the Acceptance of Society in the National Security Debate

Post September 11th national security has evolved into a set of complex concepts and institutions that cannot be clearly compartmentalized. One of the more complex overlapping interactions of security sectors that has developed is between the concepts of military and societal security. This paper will examine these two security sectors and seek to illuminate how states react to the security threats. Furthermore, it examines the criminalization of terrorism. Understanding the criminalization of terrorism will illuminate which security sector (military or societal) states believe to be preeminent in national security. This knowledge will also be of value as it will demonstrate a value shift in the international community away from the primacy of military security. My methodology will follow two parts. First, I will trace the flow of money into the two security sectors and their corollary issues. I will examine both societal expenditures and military expenditures in order to understand where the greatest concern of the state is. Second, I will examine recent efforts in the United States and abroad to demilitarize the threat of terrorism. President Obama’s statements concerning the post September 11th terrorist threat and their subsequent actions will illuminate the societalization of the terrorist threat. This will demonstrate a new paradigm in the international community, thus currently making societal security more important than military security.

7:15 PM

Spencer Duncan  

History

Ethiopia’s Water, but Egypt’s River: A History of the Hydro-politics in the Nile River Basin

The Nile River is one of the most significant natural resources in the world, yet of the ten countries it runs through, six are in the top ten poorest in the world. An understanding of the domination of the Nile rises from its long history. Over the past century, colonial and imperial interests of Europe and America have distributed control over the Nile and played a major role in inhibiting, whether intentionally or inadvertently, the growth of the majority of these riparian countries. From Great Britain and the age of African colonialism to the duel of the world powers in the Cold War and, recently, the rising international power of China, this paper provides a brief history of who really owns the Nile River.

7:30 PM

Ryan Evans  

History

Why the South Lost the Battle of Gettysburg

This paper deals with three primary mistakes made by Confederate leaders in fighting at Gettysburg in July 1863. Using the official reports of the Civil War, it is shown that Henry Heth’s untimely advance on John Buford’s cavalry forced Robert E. Lee into early action. In forcing Lee’s hand, Union soldiers were able to fortify the high ground, reversing the battlefield layout of Fredericksburg with the same results. At the same time, Richard Ewell’s failure to take Cemetery Hill when he had the chance ensured Confederate defeat, forcing Lee to take unnecessary chances. In the end, though, Lee must take full responsibility defeat at Gettysburg by not remembering the lessons he taught Union soldiers at Chancellorsville and Fredericksburg. Instead, he acted rashly and destroyed the spine of the Confederate, directly leading to the end of the Civil War.
ORAL SESSION: HISTORY & POLITICAL SCIENCE
Austin 127
7:45 PM

Benjamin Ocampo

History Education

Before the Worship of Zeus: Ancestor Worship and the Sacred Fire

Today the civilization as we know is based on the Greco-Roman Tradition. We have inherited many ideas from the Greeks, namely our system of government, the theater, mathematics and even architecture. They are the ancestors of our western civilization and have been revered throughout history as rational intelligent beings, even glorified by our historians. Though in no way can we deny their great influence on our humanity, nor the profound impact of democracy and republics, we must recognize these forbearers were human, primitive or even irrational. They came from a race still evolving into the traditions that would become our own. Before they worshipped Zeus they worshipped their kindred dead and the scared fire. Their religious beliefs were of the most ancient date with traditions that were to be followed.
The Comparison of Methods for Coping with Stress in Combat Situations from the Vietnam, Gulf, and Iraqi/Afghani Wars

There is a general increase of stress in combat situations. As seen from the Vietnam era, many of our troops came back with PTSD (Post-traumatic stress disorder) and many of the troops from that era suffer(ed) from nightmares and flashbacks that are symptoms of PTSD (Bachman 1991). Therefore, I believe that the stressors of combat situations are solved with different coping methods. Many of the coping methods used by people today are listed on the Stress Relief Control blog/website (2009). The example of our troops that came back from Vietnam with PTSD given by Bachman (1991) states that by using Imaginal Flooding or relaxation techniques troops could overcome the nightmares and flashbacks of the war. However, coping methods may be a reflection of the era. Pietrzak and Southwick (2009) state that the troops returning from those operations suffered from stress yet dealt with it by use of psychological resilience; however, this study used older troops from the National Guard or Reserve. My study will contain those that are younger than those that were studied in Pietrzak’s and Southwick’s study. Therefore, it is unclear if the coping methods have changed over time and whether or not the methods used are of any help. I will conduct a study of the differences in coping methods of the Vietnam, Gulf, and Iraqi/Afghani wars and whether the different eras have an effect on the coping methods used.

Perceived Fear

People walking within a mile or less of their homes that are afraid are less likely to own a gun. Perceived safety refers to the level of comfort one feels. They will still feel unsafe regardless of possessing a gun. The statistical analysis will show that people are less likely to own a gun while being afraid. This being because people that are afraid of walking around their home will also feel that owning a gun is also unsafe and will be afraid of possessing a gun. This analysis will provide strong evidence to prove this proposition.

Perceived Outward Signs of Righteousness

This study examines if being a Business or Sociology major has a significant impact on the way people perceive outward signs of righteousness. In the study, six statements were presented to 47 Sociology students and 109 Business students. The students were surveyed by measuring their perspective on what signs of outward obedience represented righteousness. The signs included; wealth, attaining a college degree, receiving leadership callings, etc. This was done to determine the difference and the impact between the major of Sociology and Business. Analysis supported the hypotheses that Sociology students are more likely than Business students to very strongly disagree that outward signs of obedience are a sign of a more righteous member of the LDS Church. Suggestions and implications for future research are discussed.
So You Think We Can’t Read
This paper will examine the literacy crisis that children and young adults are experiencing. It will examine the past literacy crisis the United States experienced, the positive and negative effects of technology on literacy, and how technology is actually improving literacy among children and young adults. The paper will conclude that a literacy crisis will always exist and it is in our best interest to preserve literacy by finding ways to apply technology to learning.

Educational Attainment’s Impact on Views of Homosexuality
This study examines if an individual’s educational attainment has a significant impact on their attitude towards homosexuality. The 1998 General Social Survey was used to measure the concepts in this study. To measure the independent variable, individuals were asked what their highest year of school completed is. To measure the dependent variable, individuals were asked if they believed homosexual relations were always wrong, almost always wrong, sometimes wrong and not wrong at all. This was done to determine the correlation between educational attainment and attitudes toward homosexuality. Analysis supported the hypothesis that the more educational attainment an individual has the more likely it is the individual will have a more accepting attitude towards homosexuality. Suggestions and implications for future research are discussed.

Club Amigas: Effectiveness on the Acculturation Process for Latinas in Rural USA
The purpose of this study is to compare the academic and emotional progress of Latina middle school mentees with fellow Latinas who did not participate in a mentoring program. Prior research has shown that Latinas in the United States face acculturation issues, confusion on self identity, and low motivation for academic success. 32 Latina middle school students in rural Idaho volunteered to become mentees to Latina college students from the surrounding area for a six month period. Preliminary measures were taken of each students acculturation (using the Bidimensional Acculturation Scale), self esteem (using a modified version of the Rosenberg Self Esteem Scale), and academic performance (using GPA and number of days absent). For comparison purposes identical data was collected from members of the Latina cohort who chose not participate in the mentoring program. All participating students will be reevaluated at the end of the six month period. Statistical analysis will be performed to determine if mentoring had a significant impact on the academic and emotional progress of the mentees compared to the non-mentored students.
Oral Session: Sociology & Psychology

Austin 157

7:30 PM

Travis Hall

Sociology

Perceptions of Fear and Gun Ownership

This study examines if an individual’s fearful perception of their neighborhood has a significant impact on the likelihood of owning a gun. The 2006 General Social Survey was used to measure the concepts in this study. To measure the independent variable, individuals were asked if they were afraid to walk alone at night within one mile of their home. To measure the dependent variable, individuals were asked if they owned a gun and had it in their home. This was done to determine the impact that a fearful perception has on owning a gun. Analysis rejected the proposed hypothesis that a more fearful perception would result in owning a gun. The theory had no empirical data to support it, however, another theory is proposed to explain the unexpected findings. Suggestions and implications for future research are discussed.

7:45 PM

Graham Tibbitts

Computer Science

Down Memonaid Lane

Memonaid is a student authored computer project designed to assist in the chore of memorization. It has applications in various fields and disciplines. Using Memonaid as a vehicle for research, the author demonstrates that the most effective time for study is between 9am and 9pm. This discovery directly opposes the stereotypical practice of nocturnal study for college students.
Elizabeth Hays  

**Biology**

**The Expression of Uterine Glycogen Metabolizing Enzymes in Response to Catecholestrogens Differs Between Parous and Nulliparous Rats: A Possible Explanation for Larger Litter Sizes with Increasing Parity?**

Glycogen (GLY), a component of the uterine histotroph is a source of energy that supports pre-embryonic survival and implantation. We have shown that the catecholestrogen (CE) 4-hydroxysteradiol(4-OHE2), a biologically active metabolite of estradiol-17beta(E2), increases uterine GLY accumulation in primiparous (PAR) but not nulliparous (NULL) rats. The actions of CEs through E2-independent signaling pathways may be different from or synergistic to those of E2. We hypothesize that CEs regulate in part, the accumulation and perhaps mobilization of uterine GLY reserves to support implantation. Our objectives were to determine the effects of CEs on uterine expression of the GLY metabolizing enzymes GLY synthase (GS), GLY phosphorylase (GP) and GLY synthase kinase-3beta (GSK-3beta) in PAR and NULL rats. Twenty-four each of PAR and NULL rats were ovariectomized (OVXed), assigned to one of four groups (6/group) and injected twice daily with either (1) E2, (2) 4-OHE2, (3) 2-OHE2, at 250 ug/kg body wt., or (4) vehicle only (CON), for three days. Rats were sacrificed on day 4 and uteri collected. Relative gene expression levels were determined by qPCR using the Comparative CT method with data normalized to beta-actin. In PAR rats, expression of uterine GS mRNA did not differ between CON, E2 and 4-OHE2 treatments, but was reduced 82% by 2-OHE2 (P<0.01). In NULL rats, GS mRNA expression was increased 88% by E2 (P<0.01), 45% by 4-OHE2 (P<0.05) and 14% by 2-OHE2 (N.S.). In matched comparisons, expression of GS mRNA was higher in NULL than PAR rats (percent increase: E2=92%, 4-OHE2=47% & 2-OHE2=618%; P<0.001). The expression of GSK-3 beta mRNA in PAR rats was not different between CON and E2 treated rats but was reduced 78% by 4-OHE2 and 95% by 2-OHE2 (P<0.01). In NULL rats, GSK-3 beta mRNA expression was not different between CON, 4-OHE2 and 2-OHE2 but was increased 122% by E2 (P<0.01). Expression of GSK-3beta mRNA was lower in NULL than PAR rats (percent reduction: CON=93%, E2=92%, 4-OHE2=88% and 2-OHE2=51%; P<0.001). The expression of GP mRNA in PAR rats was reduced 92% by E2 and 99% by 4-OHE2 and 2-OHE2 (P<0.001). In NULL rats, GP mRNA expression was reduced 51% by E2, 33% by 4-OHE2, and increased 188% by 2-OHE2 (P<0.01). The expression of GP mRNA was higher in hormone treated NULL than PAR rats (percent increase: E2=428%, 4-OHE2=578% and 2-OHE2=659%), but lower in CON rats (72%; P<0.01). It would appear that E2 and 4-OHE2 induced uterine GLY accumulation in PAR rats was the result of reduced GP and GSK-3beta mRNA expression. In matched comparisons, GP mRNA expression was much greater in NULL than PAR rats in response to all hormone treatments. While E2 and 4-OHE2 had no effect on uterine GS mRNA expression in PAR rats, 2-OHE2 reduced expression by 82% (P<0.01). We hypothesize that NULL rats do not store sufficient uterine GLY concentrations and thus energy required to support survival of a large number of pre-embryos. After the first pregnancy, we envision a reduction in uterine GP mRNA expression that is dependent on the actions of both E2 and CEs. This may result in a greater amount of intact GLY being available for secretion into the uterine lumen providing the necessary energy to support the survival and implantation of a greater number of embryos.(American Mink Farmers Research Found. NIH INBRE P20RR016454).
Time to Exhaustion while Exercising at Lactate Threshold

The purpose of this study was to determine time at which exercise can be sustained while working at lactate threshold and establish its fit within current CDC guidelines. College aged males and females (n=11) participated as volunteers. Three separate tests were performed. The first test determined lactate threshold and VO$_2$ peak. The second test was to determine a work rate that corresponded with O$_2$ uptake at lactate threshold. The final test was performed at a work rate equal to lactate threshold and maintained until volitional exhaustion. Mean time to exhaustion = 26.72 minutes ± 12.4 minutes. Exercise at lactate threshold falls within the CDC recommendations for improved Cardiorespiratory fitness. We suggest that future guidelines incorporate some measure of Lactate Threshold when prescribing exercise guidelines due to the arbitrariness of the current exercise heart rate guidelines.

The Effects of Warm-up Duration on 1 Repetition Maximum Leg Press/Bench Press and Push-Ups to Exhaustion

Warming up as recommended by fitness experts is thought to reduce the risk for injuries, but little is known about how warming up prior to exercise influences strength development over a six-week period. The purpose of this study was to investigate the influence of warming up on strength training as measured by a 1-repetition maximum (1-RM) bench press/leg press, and push-ups performed to exhaustion. Eighteen undergraduate students enrolled in a machine weight training class were assigned to one of three groups prior to training: no warm-up (G0), five-minute warm-up on an elliptical machine (G5), and ten-minute warm-up on an elliptical machine (G10). All groups performed the same resistance training as prescribed by their instructor, originally designed for a 14-week semester. Pre- and post-training tests were conducted for 1-RM of bench/leg press and pushups to exhaustion. Analysis of Variance (ANOVA) was calculated for all dependent variables and significance levels for all were set at p<.05. No significant difference was found between groups in bench press and push-up tests. However, leg press approached the significance level, measuring at p= .058. These results indicate that engaging in a warm-up prior to resistance training does not enhance strength development over a six-week time period.
The Effect of Squat Depth Training on Vertical Jump Performance

Movement specificity is a critical training principle. Traditionally, people emphasize performing a squat to a depth where a person’s thighs are parallel to the floor. However, sport movements such as the vertical jump require much less leg flexion for successful performances. Generally, people are able to lift more weight on a partial squat than a full squat. Jump height increases with a greater force exerted by the legs (Alexander, 1995). The purpose of this study was to investigate the impact of squat depth through resistance training on vertical jump performance. Sixteen subjects were randomly assigned to either a half squat (HS) or full squat (FS) group. During the six-week training period, FS subjects performed a squat exercise to 90-degrees of knee flexion, while HS subjects performed a squat exercise to 135-degrees of knee flexion. Pre- and post-testing values were compared using an independent T-test. No significant difference was found between the two groups (n=.915). Squat depth does not appear to be a critical factor in improving vertical jump performance.

Improvements in One-repetition Maximum Bench Press When Training the Lower Body with Free Weights and Machines

A proposed benefit of exercising with free weights is that muscles not directly involved with the exercise may be strengthened due to the activation of stabilizing musculature. Furthermore, when greater musculature is involved, anabolic hormonal response tends to be higher than when a small amount of muscle is activated. Therefore, the purpose of this study was to compare improvements in bench press (BP) one-repetition maximum (1-RM) for individuals who trained the lower-body with free weights with improvements made by those who trained with machine weights. Fourteen untrained subjects enrolled in a semester-long weight training course were randomly assigned to train lower body musculature with either free weights (FW) or machine weights (MW) for six weeks. Intensity and volume were similar for both groups and each group performed the same upper-body exercises. Between-group pre- and post-training 1-RM BP was compared using a two-tailed T-test. Significance was established at p<0.05. The free weight group increased 1-RM BP 11.3±6.9 lbs (mean±SD) to a greater extent than MW (7.5± 8.2 lbs), although these differences failed to achieve statistical significance. These results indicate that improvements in bench press 1-RM are independent of the mode of lower-body resistance training.
Examining Anthracycline Cardiotoxicity with 2-D DIGE

Anthracyclines are very potent, commonly-used, anticancer agents, but their use is limited by a dose-dependent, irreversible cardiotoxicity that has both acute and chronic forms; cardiotoxicity that may be associated with risk for development of congestive heart failure (CHF). Two other risk factors that increase risk for CHF in patients are high blood pressure and high blood sugar. A malfunction in the heart protein quality control system is hypothesized to be responsible for CHF pathogenesis. Since the ubiquitin proteasomal system (UPS) is responsible for turnover of short-lived proteins, proteins involved in various cellular processes such as cell-cycle division; DNA repair, growth, and differentiation; quality control; and regulation of membrane receptors and ion channels, the cardiotoxicity caused by anthracyclines could be due to a malfunction in the UPS. It is the objective of this research to examine differences in protein levels between control and anthracycline-treated, rat heart, cytosolic homogenates. Analysis and evaluation will be by 2-dimensional difference gel electrophoresis (2-D DIGE). This method allows us to examine differences between two treatment groups on one gel. Samples are tagged fluorescently and then run on the same gel; treatment-dependent protein variations can be compared and contrasted side by side. Proteins that differ can be excised and then identified via mass spectrometry. Preliminary studies with saturation dyes suggests that 2-D electrophoresis is compromised (spots become streaks). This diagnostic approach based upon prospective proteomic biomarkers offers promise for personalized medicine.

Red Florescent Protein Expression in Streptococcus thermophilus and Lactobacillus acidophilus (The Glogurt Experiment)

Commercial yogurt is produced by the fermentation of lactose by several bacterial species. *Streptococcus thermophilus* and *Lactobacillus acidophilus* are among the most common used. Red Florescent Protein (RFP) is a variant of Green Florescent Protein (GFP) isolated from the jellyfish *Aequorea victoria*. GFP and its derivatives emit light when exposed to ultraviolet light. Through electroporation *S. thermophilus* and *L. acidophilus* are transformed using a RFP plasmid. Transformed bacterial species are then used to make yogurt that glows red under UV light.
Horizontal Gene Transfer (HGT) of the DsRed2 Gene via Phagocytosis in the Social Amoeba, *Dictyostelium discoideum*

Horizontal gene transfer (HGT) via phagocytosis is predicted to be a viable mechanism of transferring genetic material from *E. coli* to the social amoeba *Dictyostelium discoideum*. We presented *E. coli* containing the prokaryotic expression plasmid, pDsRed2 that contains the red protein producing gene, DsRed2, to *D. discoideum* amoeba for phagocytosis on a solid surface or in liquid media and detected DsRed2 expression that continued through multiple generations of amoeba. We extracted, and sequenced the DsRed2 gene from 2nd generation genomic DNA which supports a successful HGT event; approximately 30 nucleotide size fragments from both the upstream and downstream flanking regions of the DsRed2 gene were sequenced and megaBLASTed with the *D. discoideum* AX4 genome. The upstream sequence demonstrated 64% query coverage with chromosome three of the *D. discoideum* genome and the downstream sequence demonstrated 100% query coverage of chromosome three. Fluorescent automated cell sorting (FACS) analysis detected the red fluorescence protein in amoeba in about 1 in every 10,000 amoeba or at a frequency >0.0010% from both 2nd and 3rd generation amoeba. Our results support the transfer of the DsRed2 gene from a live *E. coli* to *D. discoideum* via phagocytosis, and its successful expression and retention for at least three generations. To demonstrate the exact location of the DsRed2 gene transfer event, on the amoeba’s chromosome, we will use the thermal asymmetric interlaced (TAIL-) PCR technique. This technique will allow us to amplify and then subsequently sequence about 200-1000 basepairs of the amoeba’s chromosomal DNA that lies immediately upstream of the inserted DsRed2 gene. The technique incorporates three DsRed2 gene specific primers in a nested form and one or two, short, primers, 10-16bps of arbitrary length. The amplified region from the TAIL-PCR technique will then be analyzed with the Basic Alignment Search Tool (BLAST) against the *D. discoideum* genome to render the chromosomal location of the DsRed2 HGT event.
Non-Aqueous Capillary Electrophoresis

Traditional capillary electrophoresis employs aqueous solvents and electric fields to separate compounds; however, neutral compounds cannot be separated using traditional techniques. Non-aqueous capillary electrophoresis (utilizing methanol solvents) allows for significant ion-analyte interactions, not possible in aqueous solvents, improves separation versatility, i.e., both charged and neutral compounds can be separated. Sodium has been found to be the best ion in methanol to separate compounds due to auto-sodination. Concentration of ions and viscosity of solution affect migration time and separation from several minutes to an hour.

Simultaneous Two-dimensional Electrophoretic and Chromatographic Separations

Traditional two-dimensional separations occur in series, i.e., a single separation occurs in one dimension and a subsequent separation at 90 degrees to the first. The ability to conduct “true” two-dimensional separations was investigated. Paper chromatography was used simultaneously with electrophoresis to separate an assortment of dyes. A novel apparatus was developed allowing for voltage to be applied orthogonal to, and concurrently with capillary action. The dyes were spotted onto chromatographic paper, an isopropyl/water mixture with glycine as a buffer served as the mobile phase/electrolytic solution, and 300 volts were applied over 30 minutes to produce two-dimensional separations based on charge and size in one dimension, and selective affinity for the mobile phase in the second dimension.

Shot Peening

Shot peening has been used for many years to strengthen metal for industry. However, these metals can become weaker if they are heated up to the point where the crystal lattice begins to change. Using the technique of positron annihilation spectroscopy, copper coupons that have been shot peened and annealed at various temperatures, are going to be measured according to their S-Parameter. This technique will show graphically what is happening to shot peened metals as they are heated up in everyday wear and tear.
Assessing the Impact of Automated Feedback Using Microsoft Excel™

Current technology allows for various forms of web-based homework programs that provide students with practice problems and automated feedback. The contribution to learning of these various feedback styles is explored using Microsoft Excel™ in a general chemistry course. At the end of each learning module, students are paired into groups and given a Microsoft Excel™ “pre-quiz”. Each pre-quiz contains a slightly different set of questions that are randomly generated, but similar in format. Groups are also randomly assigned a feedback style (immediate, delayed, or no feedback) with each pre-quiz. Students complete the pre-quiz during class time and then take a multiple choice “post-quiz”, administered in the testing center. The post-quiz questions are similar in format to the questions on the pre-quiz. Performance on the post-quiz is compared with 1) performance on the pre-quiz and 2) feedback style. Regression analysis has not yet been performed because the data set is still incomplete. It is anticipated that we will be able to determine if significant differences exist between student performances on the post-quizzes, based on feedback style. We will also explore the possibility that certain feedback styles lead to greater improvement from pre-quiz compared with the score on the post-quiz.

Existence of Peroxy-water Radical Complexes in the Atmosphere: A Computational Study

Previous research has confirmed the importance of organic peroxy-radical contributions to the formation of nitrogen oxide and tropospheric ozone. Computational research has shown that for small, methyl- and ethyl-sized R-groups, peroxy radicals have been stabilized by complexing with water in the atmosphere, with binding energies ranging from 2-5 kcal mol⁻¹. The present study presents calculations completed for the 2-hydroxy-3-peroxy-hexanal radical that represents part of an effort to examine larger peroxy radical-water complexes and their contribution to atmospheric processes. Calculated bond lengths, bond angles and vibrational frequencies for the hexanal radical-water complex are consistent with other complexes examined in previous studies, suggesting this complex is stabilized by hydrogen bonding and strong CH-O interactions. Additional, intramolecular stabilizing forces will also be discussed.
Duct Temperature Rise Analysis

JBT AeroTech requested a heat transfer analysis be performed on their current air conditioning duct which runs from their mobile cooling unit to the aircraft. The main objective of this analysis was to begin to understand key factors which affect the temperature rise within the duct and then to develop a model which accurately captures the effect of those factors. An error analysis was to be performed by comparing the values produced by the theoretical model and the experimental data. It was determined that there are numerous factors which affect the temperature rise within the duct. These factors include solar radiation, internal convection, conduction through the duct walls, external convection, and external condensation. Furthermore the duct has certain material properties which also play an important role affecting the temperature rise. These material properties include duct length, wall thickness, and the thermal conductivity of the duct material. After analyzing and modeling all of these factors, it was determined that external condensation, if present, has the greatest impact of the temperature rise within the duct. In addition to these findings it was determined that a small increase in the duct wall thickness or a small improvement in the thermal conductivity of the duct material greatly reduces the amount of condensation which occurs.

An Efficient Structure for Multi-Threaded Access in Discrete Event Simulations

Many different organizations, businesses, and manufacturing plants model and optimize workflow using discrete event simulation tools. All of these products have embedded in them a complex simulation engine. Current and past discrete event simulation engines have been designed to run optimally on a single thread in a computer with a single processor. This is non-optimal with current multi-core hardware and operating systems. Computers are now built with multiple cores and processors. A well written simulation engine should therefore take advantage of these multiple cores and see a substantial decrease in the time required to run a simulation. While this parallel type of simulation engine can be difficult to design, and even more difficult to control effectively, it should be accomplishable by a competent engineer. Dividing up the work to be done before it is executed is a new approach that speeds up a parallel engine. This allows the engine to take advantage of multiple cores and processors effectively, and at the same time is simple to understand and implement. Tests run on a single engine that divides the work into multiple arrays show substantial speed improvements. After doing multiple runs with a different number of arrays for dividing the work, the average run times are:

1 array: 29.412414 seconds
84 arrays: 4.934566 seconds
84 arrays with 4 threads: 3.757355 seconds
**ORAL SESSION: PHYSICAL SCIENCES**  
**Austin 156**

7:00 PM

Scott Fuller  
*Physics*

**Hidden Rays: The Discovery of Radioactivity**

The developments of new sciences have always changed mankind’s views of this world, both the philosophical and scientific outlooks. Over 100 years ago, a group of scientists made discoveries that have led us into the atomic age. Wilhelm Rontgen first discovered radioactivity in 1896, and the discovery even startled him. In the years that followed, Henri Becquerel, Marie and Pierre Curie, and many others made dramatic advancements to the science of radioactivity. Curiosity allowed those bright men and women to develop a new science that has become so important to new discoveries in our day, including many important breakthroughs in modern medicine. The experiences that those historic scientists enjoyed are too important to be forgotten, and for this reason it is wise for students of the sciences to document them and learn from them. Through study of the history and development of the science of radioactivity, I intend to show that the beginnings of this science were filled with impressive discoveries of the microscopic, atomic world that have dramatically changed the macroscopic, physical world that mankind experiences every day.

7:15 PM

Bryan Lewis  
*Mechanical Engineering*

**An Aerodynamic Approach to Dynamic Soaring Gliders**

Dynamic soaring is made possible by the wind passing over a ridge, creating a shear layer in the air flow that separates fast-moving air from the calm air on the back side of the ridge. By using the fast-moving air and shear layer, gliders are capable of reaching speeds over 300 mph. Glider pilots, mostly hobbyists, have been exploring the possibilities of dynamic soaring for many years, but no aerodynamic analysis of optimal glider design and flight patterns have ever been published. This research explores the G-Force loading experienced in flight, the needed lift capabilities of the optimal dynamic soaring glider, and presents several airfoil designs that are optimal for dynamic soaring.

7:30 PM

Greg Nelson  
Michael Cammack  
*Mechanical Engineering*

**Design Optimization of a Composite Sandwich Panel Wing Spar**

Radio controlled gliders, employing a technique called dynamic soaring, can reach speeds over 300 mph and accelerations up to 100 Gs. The wings of an aircraft under these loading conditions must be highly optimized. Hobbyists without much engineering background build upon very basic principles without consideration of engineering mechanics. In the current project, analytical models were developed and verified experimentally. To aid in the design of the wings, a computer program was developed for hobbyists and students. Material properties, geometry of the wing, weight of the plane, and acceleration seen are specified in the program. The program provides a user interface to more easily design the wings of the glider. The experiment showed that the wing performs the same as modeled in the program. Thus the program is a useful tool to design the wings of the glider according to engineering mechanics.
Cosmetic Corrections in Wood Beams

The appearance of splitting, checking, and shakes in wooden beams are an undesired natural occurrence. These cosmetic defects produce added maintenance enticing alternative methods to reduce their effects over time. New corrective methods were analyzed in order to determine possible measures to prevent undesired effects or eliminate checking, splitting, and shakes. Variations in moisture content and temperature versus time indicated which methods were most useful in preventing and reducing these undesired traits. The objective of this paper is to demonstrate the performance of the new preventative measures that were analyzed.
UGRC Ring is a soft red winter wheat (Triticum aestivum L.) cultivar registered for Ontario, Canada. It has high grain yield, with good pastry quality (high flour... Article (PDF Available) in Canadian Journal of Plant Science 95(5):150608045046002 Â· June 2015 with 68 Reads. DOI: 10.4141/CJPS-2015-068. We recently registered online as auto-entrepreneur with regime micro fiscal. (1st May) We have been accepted as homme de toutes main and not on the ACCRE scheme - just as we asked. The next forms we were expecting were tax and social charges declarations from RSI but we have received the GIE AG2R and are being told to fill in for lâ€™UGRR or lâ€™UGRC - whichever is relevant to our business, as far as we knew we were RSI. Are we going to get RSI forms as well? The Microsoft Visual C++ 2010 SP1 Redistributable Package (x86) installs runtime components of Visual C++ Libraries required to run applications developed with Visual C++ 2010 SP1 on a computer that does not have Visual C++ 2010 SP1 installed.