

**PROCEEDINGS
OF THE
OREGON ACADEMY OF SCIENCE**



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**PROCEEDINGS OF THE
OREGON ACADEMY OF SCIENCE**

Heide D. Island
Pacific University
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THE OREGON ACADEMY OF SCIENCE

Keynote Address

*Dr. William Hersh, M.D.
Oregon Health Science University*

*“BIOMEDICAL INFORMATICS: OPPORTUNITIES
FOR THE 21ST CENTURY DISCIPLINE AND
PROFESSION”*

William Hersh, M.D., is professor and chair of the Department of Medical Informatics & Clinical Epidemiology in the School of Medicine at Oregon Health & Science University (OHSU) in Portland, Oregon. Dr. Hersh is a leader and innovator in biomedical informatics both in education and research. He has also written and spoken extensively on policy issues related to the use of health information technology, such as the National Health Information Infrastructure and the need to develop a professional workforce to lead implementation of health information technology. More information about Dr. Hersh can be found on his website at: www.billhersh.info.

THE OREGON ACADEMY OF SCIENCE

Outstanding Scientist Award

The Oregon Academy of Science's Outstanding Scientist Award is awarded in recognition of significant research contributions to the natural, physical, or social sciences, notable reputation in science education, and meaningful contributions in the application of science research. Recipients of this award must have been Oregon residents during the time they made the distinguished contributions for which they are recognized. Past recipients of the Outstanding Scientist Award are listed below

1949	F. L. Griffin A. R. Moore E. L. Packard	1963 1969	E. A. Gilillan Ira S. Allison Frank M. Beer
1950	A. A. Knowlton Thornton Munger Warren D. Smith	1970	A. A. Groening James A. Macnab James J. Brady
1951	Stanley W. Jewett Morton E. Peck J. Hugh Pruett		Bert Christensen E. Ebbighausen Ralph W. Macy
1952	Helen M. Gilkey L. E. Griffin Ethel I. Sanborn	1971	Cecil R. Monk Leo F. Simon Andrew Moursund
1953	W. P. Boynton Olaf Larsell Rosalind Wulzen		Loren McKinley Homer G. Barnett Stephen Shelton
1954	Leo Friedman Alonzo W. Hancock Willibald Weniger	1972	Samuel N. Dicken Helen M. Gilkey R. Sinnhuber
1955	W. J. Kroll 1973 F. W. Libbey W. E. Milne		George Birrel Harold J. Evans Anton Postl
1956	E. T. Hodge R. R. Huestis E. J. Krause J. P. Mehlig Harry B. Yocum	1974	Lloyd W. Staples Larae Dennis Joel Hedgspeth Thomas P. Thayer Norman S. Wagner
1957	L. S. Cressman Leo Isaac 1975 Adolph Kunz E. E. Osgood		Aaron C. Waters John Allen Ralph Badgley Ewart Baldwin
1958	Phil F. Brogan Vernon Cheldelin Samual L. Diack		Winthrop Dolan William Rockie Howel Williams
1959	Walter Dyke Henry P. Hansen Alex Walker	1976	Harold Enlows Paul Elliker Paul Weswig
1962	Joe Chamberlin F. Gilchrist Earl Gilbert Arthur F. Scott Edward S. West	1977 1978 1979 1980 1981	Robert Coleman W. Taubeneck G. Bodvarsson Kensal Van Holde Ernst Dornfeld

THE OREGON ACADEMY OF SCIENCE

Outstanding Scientists (con't)

1982	Howard Vollum
1983	Carl E. Bond
1984	Arthur J. Boucot
1986	Paul Lutus
1987	Linus Pauling
1988	Lewis Schaad
1990	C. Melvin Aikens
1991	Jack Ward Thomas
1992	Beatrice Epperson
1993	Lynwood W. Swanson
1994	Jane Lubchenco
1995	Michael Posner Paul Slovik
1996	A. Morrie Craig
1997	William G. Loy
1998	Gertrude Rempfer
1999	LeRoy Klemm
2000	Kent L. Thornburg
2001	Geraldine L. Richmond
2002	Carl Wamser
2003	Joseph D. Matarazzo
2004	M. Aslam Khalil
2005	Ewart M. Baldwin
2006	David C. Johnson James D. White
2007	Richard Ellis
2008	Andrew Fountain

2008 THE OREGON ACADEMY OF SCIENCE

Outstanding Scientist Awards

Dr. Andrew Fountain is an internationally recognized glaciologist whose research focuses on the basic physical laws that control processes on glacier ice. Andrew has conducted extensive field research projects in Antarctica, Alaska, Sweden, and the Pacific Northwest (PNW) of America. His recent project in the PNW, featured in the Oregonian in 2006, was developing a Geographic Information System (GIS) database of glaciers and glacier change. Andrew's decade of work in Antarctica led the U.S. Geological Survey (USGS) to name the Fountain Glacier after him. In addition, in 2005 the Geological Society of America elected Andrew as a fellow for his outstanding achievements in his field. All of his fieldwork and modeling work have made significant contributions to our understanding of the processes causing glacial change and how it ties

into patterns of global warming. More information about Dr. Fountain can be found on his website at: <http://glaciers.pdx.edu/fountain/>

THE OREGON ACADEMY OF SCIENCE

Outstanding Teacher Award

The Oregon Academy of Science's Outstanding Teacher Award is awarded to Oregon teachers with a demonstrated record of excellence in teaching in any of the subject areas represented in the Academy. Recipients of this award must have been Oregon residents during the time they made the distinguished contributions for which they are recognized. Past recipients of the Outstanding Teacher Award are listed below.

1992	Bea Epperson
1993	Stephen Boyarsky
1994	Roy Chambers Andrea Hyslop Elizabeth Nirschel Jan Heaton
1995	Ford Miyashita
1996	Edith Anderson Pamela Lopez
1997	Mary Omberg Terry Favero
1998	Rosa Hemphill Joel Kuyper Diane Nelson
1999	Dwight Kimberly Bill Lamb
2000	Becky A. Houck Richard Duncan
2001	Patty Toccalino Kathleen Wickman
2002	David Damcke
2003	Kenneth M. Doxsee James E. Hutchison Ralph Schuboth
2004	Gwen Schusterman John Gibbs Chris Murray
2005	Richard P. Taylor Gail Gederman
2006	Peter Langley
2007	Tamina Toray Dan Jamsa
2008	April Ann Fong Terry Tucker

THE OREGON ACADEMY OF SCIENCE

Outstanding Teacher Award *Higher Education*

Dr. April Ann Fong
Portland Community College - Sylvania

Dr. April Ann Fong continuously brings a high standard of excellence to the classrooms and labs she teaches while showing her students and colleagues how each of us can improve the world we live in through service learning and other volunteer activities. Dr. Fong has long been recognized as one of Portland Community College's great teachers. Her teaching strengths include an engaging enthusiasm, the ability to clearly explain complex concepts, and her commitment to providing feedback for her students. She organized the PCC Sylvania Habitat Team in an effort to recruit student and staff volunteers to improve campus and community ecosystems. She has also been instrumental in establishing the PCC Sylvania Green Team, a campus based group that has taken a lead in improving the sustainability practices of the PCC Sylvania campus.

Outstanding Teacher Award *K- 12*

Terry Tucker
Keizer Elementary School

Mr. Terry Tucker, an elementary teacher at Keizer Elementary School in Keizer, OR, makes science a significant part of his everyday instruction. Terry has been the recipient of the Salem-Keizer schools Crystal Apple Award for Teaching Excellence and the Oregon Science Teachers Association Outstanding Classroom Teacher Award. He received a Salem-Keizer Education Foundation grant for a "Heliocentric Learning" science project in his school. Terry is part of the Teacher-Leader Cadre for the Oregon Department of Education, and is the current president of the Oregon Science Teachers Association.

BIOLOGY

Section Chairs:

Dwight Kimberly
George Fox University

Jeff Duerr
George Fox University

BIOLOGY- ORAL PAPERS

M₃-MUSCARINIC RECEPTOR ACTIVATION OF ERK AND CELL GROWTH REQUIRES CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASES IN MCF 7 CELLS. Ellen Abell and John Schmitt. Department of Biology, George Fox University, Newberg, OR 97132.

The extracellular signal-regulated protein kinase (ERK) signaling pathway is found in diverse cells throughout the human body. ERK activation has been implicated in breast cancer cell growth and proliferation. Studies have shown that ERK is activated by carbachol, a G Protein-Coupled Receptor (GPCR) agonist, which increases intracellular calcium in MCF-7 cells. The calcium/calmodulin-dependent protein kinase (CaM K) family of proteins including CaM KK, CaM KI, and CaM KII can be activated by increased intracellular calcium. Our goal was to determine whether CaM Ks may be responsible for ERK activation and cell proliferation in carbachol-treated MCF-7 cells and evaluate which GPCR was responsible for these events. Carbachol treatment of MCF-7 cells triggered ERK 1/2 phosphorylation within 5 minutes. Treatment with KN-93, a general CaM Kinase inhibitor and the MEK inhibitor U0126 blocked ERK activation. Carbachol increased MCF-7 cell growth nearly 4-fold, an effect that was also dependent upon CaM Ks and MEK. Interestingly, CaM KK was responsible for ERK activation and cell growth. Pretreatment of MCF-7 cells with 4-DAMP, a selective M₃ receptor antagonist, completely blocked carbachol's activation of ERK and cell growth. Taken together these results suggest that carbachol stimulated ERK phosphorylation and MCF-7 cell growth by the M₃ subtype GPCR receptor perhaps through CaM KK.

MONITORING OF THE LOWER VERTEBRATE FAUNA OF THE FAIRVIEW MITIGATION WETLANDS IN SALEM, OREGON. Ben Crabtree and Hannah Vietmeier, Department of Biology Willamette University, Salem, OR

Sampling of the reptilian and amphibian species found in the Fairview Industrial area during the calendar years of 2006 and 2007 has provided some insight into recruitment associated with this site formerly cleared and graded for agricultural use. Sampling has included assessment of the fish species during 2007. Terrestrial data were collected using a combination of cover boards and transects (bi-weekly) as well as pit-traps and drift fences for two week intervals, three times per year. Aquatic sampling was restricted to minnow traps also for two week intervals, three times per year corresponding to pit-trapping activities. Species common to urban habitats are abundant in this wetland, although the most common form is the exotic, *Rana catesbeiana*. Other species that we might expect to find here are either lacking or are very rare. The data gathered this year suggest that the densities of all captured terrestrial species have increased compared to 2006 with the exception of *Pseudacris regilla*. The relative "rarity" of the Pacific Chorus Frog was exhibited in both the larval and adult forms. During the past two years, densities have fluctuated significantly allowing limited predictive value to these data, however given the changes associated with this wetland we may be able to provide some direction to proposed modifications to this habitat that may enhance recruitment while providing an educational opportunity for public enjoyment.

CARBACHOL REGULATION OF AKT IN LNCAP PROSTATE CANCER CELLS. Luke Fletcher and John Schmitt. Department of Biology, George Fox University, Newberg, OR 97132.

Hormones and agonists that enhance cell survival through binding specific G Protein-Coupled Receptors (GPCRs) are of particular interest in cancer cell survival. LNCaP cells have been shown to express muscarinic cholinergic receptors that are responsive to the agonist, carbachol. In addition, LNCaP cells specifically express the M3-subtype of GPCR's that may couple carbachol to Gq and increases in intracellular calcium. Previous studies have demonstrated that increases in intracellular calcium bind to the protein calmodulin to activate the intracellular Ca²⁺/calmodulin-dependent protein kinases (CaM Ks). The CaM Ks family of proteins includes CaM Kinase Kinase (CaM KK) and its direct substrates CaM Kinase I and the protein kinase AKT. AKT is an anti-apoptotic enzyme that phosphorylates BAD and inhibits caspase activation. Our goals were to determine the mechanism of carbachol activation of AKT in LNCaP prostate cancer cells and evaluate whether CaM Kinases may be mediating carbachol's activation of AKT and cell survival in LNCaP cells. The results suggest that AKT phosphorylation was increased in response to a five minute stimulation with 10 μ M carbachol in LNCaP cells which was blocked by the the CaM Kinase inhibitor, KN-93 suggesting the involvement of the CaM Kinase proteins in the pathway. In contrast, there was no inhibition by U0126, suggesting that AKT is activated independently of MEK and

ERK. The CaM KK inhibitor STO-609 and calcium chelator EGTA both potently inhibited carbachol's activation of AKT. Furthermore, our results indicate that carbachol treatment of LNCaP cell reversed the cell death effects of anisomycin while KN-93, 4-DAMP, and EGTA all inhibited the survival effects of carbachol. Carbachol's survival effects appear to be operating through the M3-subtype receptor and mediated by calcium activation of CaM KK and the phosphorylation of AKT leading to cell survival.

MIGRATION BEHAVIOR OF INTRODUCED AMERICAN SHAD (*Alosa sapidissima*) IN THE COLUMBIA AND SNAKE RIVER SYSTEM. Robert Hogg¹, Christopher Caudill², ¹ Department of Biology, Southern Oregon University, Ashland, OR 97520, ² College of Natural Resources, University of Idaho, Moscow, ID 83843.

American shad *Alosa sapidissima* were first introduced to the Sacramento River from the North American Coast of the Atlantic Ocean in 1871. A population reached the Columbia River in 1876 and now shad are the most abundant species of anadromous fish in the system. Ecology of Columbia shad is poorly understood chiefly due to their non-native status and emphasis on preservation of native species, particularly salmonids. This study utilizes state of the art sampling techniques at U.S. Army Corps of Engineers adult fish bypass facilities (fish ladders) located at hydroelectric dams along the Columbia and Snake Rivers. Non-lethal sampling at Bonneville Dam's Adult Fish Facility (AFF) allowed the opportunity to assess and tag adults at the beginning of migration. The sampling procedure included condition assessment with sex determination and body length, collection of scales for age and growth history, determination of energetic state using low energy microwave probe (Distell Fatmeter), and tagging with Passive Integrated Transponder tags (PIT tags). PIT tags are small, unpowered, permanent transponders that are induced to transmit a unique code when passed through the field of a powered antennae located in the fish ladders of four dams. PIT tagging allowed continued monitoring of individual migration behavior, and presented opportunity to address research objectives. Results suggested that adults in their second spawning migration had correlation between recent relative growth (RRG) and body lipid contents, and that these fish were more likely to be detected upstream at the McNary Dam fish ladder. Among returning shad, those with high RRG values during their first spawning migration were more likely to return for a second. These results infer that RRG appears to influence survival and migration behavior, but depends on life history stage. First time migrants appear to allocate resources from growth (RRG) for reproductive development and survival, while second time migrants appear to allocate resources for migratory preparation (energetic lipid storage).

AQUAPORIN WATER CHANNELS IN THE SKIN OF THE ROUGH-SKINNED NEWT (*TARICHA GRANULOSA*) Ekatarina Barsargin and Donald R. Powers. Department of Biology, George Fox University, Newberg, OR 97132

Most amphibians exhibit a high rate of evaporative water loss (EWL) due to the porous nature of their skin. One way amphibians counter water loss is by cutaneous water absorption (CWA). In most anurans, the pelvic patch on the ventral skin and the urinary bladder are the important osmoregulatory organs. However, morphological features associated with CWA in urodele amphibians is less well understood. Past studies suggest that the presence of aquaporin water channels is a key feature in CWA in anurans. In this study, we examined identified the presence of AQP1 and AQP2 in the ventral skin of the rough-skinned newt (*Taricha granulose*), a urodele amphibian. The presence of AQP2 is particularly notable since it is hormonally controlled and could be used as a means of adjusting skin permeability.

MICRODISTRIBUTIONAL RESPONSES OF AMERICAN PIKAS, *OCHOTONA PRINCEPS*, TO GLOBAL CLIMATE CHANGE. ¹Lawrence W. Powers, ²Tom Rodhouse, ³Erik A. Beever, ⁴Chris Ray. ¹Department of Natural Sciences, Oregon Institute of Technology, Klamath Falls OR 97601; ²National Park Service, Upper Columbia Basin Network, Central Oregon Community College, Bend, OR 97701; ³U.S. Geological Survey, Alaska Science Center, 1011 E. Tudor Rd., Anchorage, AK 99503; ⁴University of Colorado-Boulder, 334 UCB, Boulder, CO 80309.

American pikas, *Ochotona princeps*, are small, diurnal mammals that are distantly related to rabbits. Most populations inhabit subalpine talus slopes, boulder piles, and other rocky areas with deep crevices that are suitable as refugia. Pikas are known to be sensitive to warm temperatures (as low as 25.5–29.4°C in ambient shade) and fossil evidence suggests that lower-elevation populations have decreased dramatically during post-Pleistocene warming. Pikas may be able to migrate to higher elevations concurrent with vegetation response if climate change occurs slowly. This may not be possible if temperatures increase rapidly without plant colonization. Some pika populations persist at lower elevations by utilizing complex (and insulative) microtopography, lava flows and collapsed lava tubes. Four National Park units are embarking on a collaborative study of pika ecology and behavior to ascertain adaptive strategies to climate change. The pikas in Craters of the Moon (ID) and Lava Beds National Monument (CA) are distributed horizontally at low elevations among lava boulders, while those at Crater Lake (OR) and Mt. Lassen Volcanic Park inhabit typical high-elevation talus slopes. The study will measure microhabitat temperatures and correlate these with feeding and territorial behaviors within these different habitats. Data from earlier studies at these sites will also be summarized.

Objectives for understanding critical ecological factors and their role in managing pika populations will be discussed briefly.

THE EFFECT OF SOME PHYSIOLOGICAL, MORPHOLOGICAL, AND ENVIRONMENTAL VARIABLES ON HOVERING METABOLIC RATE IN HUMMINGBIRDS. Smith, K. M., Powers, D. R., Wethington, S. M., Getsinger, P. W, and Tobalske, B. W. Biology Department, George Fox University, Newberg, OR 97132; Hummingbird Monitoring Network, Patagonia, AZ; Biology Department, University of Portland, Portland, OR.

We measured hovering metabolic rate (HMR) during nectar feeding under varying temperature and wind conditions in 7 hummingbird species with body sizes ranging from 3-8 g. Whole-animal HMR was positively correlated with body mass (slope = 0.4, $R^2 = 0.72$) while mass-specific HMR did not change notably with body mass (slope = -0.05, $R^2 = 0.38$) averaging around 0.6 mL O₂ g⁻¹min⁻¹. For 3 species ranging in mass from 3-8 g mass-specific HMR appears to be positively correlated with wing loading (slope=0.22, $R^2=0.88$) but shows no relationship with wingspan (slope=-0.01). We had sufficient data to analyze temperature and wind effects on HMR in 5 species. Overall we found little evidence for thermoregulatory substitution using heat produced during hovering at operative temperatures between 15-45 °C. HMR increased with temperature in 3 species with temperature explaining as much as 26% of the variation and suggesting increased thermoregulatory cost. No wind effects were observed between 0-2.5 m/s, but this could change when wind-direction data are included in the analysis.

THE DETERMINATION OF SEX BASED ON THE TALUS THROUGH THE APPLICATION OF LOGISTIC REGRESSION. Richard D. Torres¹, Terri B. Torres², Department of Natural Sciences, Oregon Institute of Technology, Klamath Falls, OR, ²Department of Mathematics ,Ohio Northern University, Ada, Ohio,45810

The architectural design exhibited by the skeletal elements which comprise both the cranial and postcranial skeleton is a consistent physical feature shared among all individuals of the human population. However, following closer examination it becomes evident that morphological variations exist among various isolated skeletal elements; these variations in morphology can be used in establishing individual uniqueness such as age, sex, stature, and ancestry. It is the inherent uniqueness of those elements that enables the field of forensic biology to establish identity to isolated human skeletal remains. The objective of this study was to determine whether the sex of an individual could be determined based on a series of osteometric measurements taken from the talus. The skeletal material used in this study is part of the Hamann-Todd osteological collection deposited at the Cleveland Museum of Natural History Physical Anthropology Laboratory. A total of 11

measurements were taken from the tali of 66 white males and 65 white females. Through the application of logistic regression it was shown that a minimum of two talar measurements will provide a high (over 90%) probability of successfully determining sex of the individual.

BIOLOGY - POSTERS

HOW DO PATTERNS OF MEADOW USE BY RESIDENT ELK (*CERVUS ELAPHUS ROOSEVELTI*) AT HAGG LAKE VARY OVER TIME? A COMPARISON OF 2006/7 TO 2007/8. Sherylle Cadiente, Channasy Casio, Kihei Castillo, Christopher Caswell, Shannon Rau, Kevin Spangler, Dylan Taylor, Edmond Alkaslassy, Pamela Lopez, Department of Biology, Pacific University, Forest Gove, OR, 97116.

Henry Hagg Lake was created in 1975. As a result meadows that had been used by resident elk for forage during the winter months were flooded. The loss of those meadows was mitigated by construction of new meadows (n = 8) above the new water level. The meadows vary in size (from 3.5 acres to 29.5 acres), proximity to the paved road that surrounds the lake, and in composition and state of vegetation (from a mowed mix of non-native and unpalatable species to recently disked and planted with non-noxious grasses and clovers). Each meadow was sampled for elk scat using plot and transect methods every two weeks from November 2006 through February 2007 and again from October 2007 through February 2008. We will describe and offer explanations for differences in meadow use between the 2006/7 and 2007/8 study periods.

REACTIVE POLYPHENOLS AND DISSOLVED NUTRIENTS IN AN N-LIMITED HEADWATER CATCHMENT IN WESTERN OREGON, USA. Janet Rasmussen¹, Kate Lajtha², Bruce Caldwell², Water Resource Graduate Program, Oregon State University, Corvallis, OR, 97331 ²Department of Botany and Plant Pathology, Oregon State University, Corvallis, OR 97331.

Nitrogen is the limiting nutrient in most undisturbed terrestrial ecosystems. Most of the N leaving unpolluted headwater streams is dissolved organic nitrogen (DON), associated with humic substances, including tannins. Plant communities adapted to N-limited ecosystems are rich in condensed tannins. Condensed tannins are reactive polyphenolic (RPP) compounds that bind with organic N. RPPs enter the soil as plant litter and other decomposition products, and can bind organic N into complexes that resist decomposition and leach from the system. We hypothesize that increased concentrations of reactive polyphenols are associated with increased percent DON in an N limited catchment. Using a novel approach, we separate and quantify the soluble RPP fraction of total polyphenols, and relate this to nutrient chemistry in both soil and stream water over a storm event. The study site is Watershed 10 of H.J. Andrews Experimental

Forest (HJA), which has very low anthropogenic N inputs. Over 80% of the nitrogen leaving HJA is DON. Water samples are collected from soil, a 10 meter wide section of hillslope, and the gaged stream. %RPP is found by separation using polyamide exchange resins, as well as traditional protein precipitation assays. This novel approach examines polyphenols by function in the natural system, using tannin standards similar to local vegetation composition. Preliminary work indicates that about 75% of the polyphenolics in WS10 samples during the first Fall storm are reactive, while the DON averaged 92% of total N. Increased polyphenol concentration during the first Fall storm of 2007 were associated with increased %DON.

DOES KINSHIP COMPOSITION OR GROUP DENSITY AFFECT TADPOLE FITNESS IN THE PACIFIC TREEFROG (*PSEUDACRIS REGILLA*)? P.T. Lopez, E. Bredeweg and A. Soken. Department of Biology, Pacific University, Forest Grove, Oregon 97116.

Kinship composition has been shown to affect various aspects of the fitness of tadpoles in several species, but this has not been studied in the Pacific treefrog (*Pseudacris regilla*). From eight newly oviposited clutches of presumably different parentage we established and maintained six replicates of each kinship group of tadpoles. Each kinship group consisted of eight tadpoles originating from either one or multiple egg masses and housed at either low (0.5 L water) or high (1 L water) density. The four kinship groups were: full siblings—all eight tadpoles from the same egg mass; mixed siblings A—four tadpoles from each of two egg masses; mixed siblings B—two tadpoles from each of four egg masses; and mixed siblings C—one tadpole from each of eight egg masses. We measured body mass, body length and tail length, determined stage of development, and measured nearest neighbor distance for each tadpole every seven days until each tadpole reached metamorphic climax (MC). Body length and body mass was measured for each individual at MC. Neither kinship composition nor group density affected mean body length or body mass at MC or the mean number of days to reach MC. The mean proportion of tadpoles that reached MC was significantly higher in full sibling, low density groups than in any other combination of kinship and density. Moreover, cannivory was never observed in full sibling groups of either density. These results may suggest that tadpoles of *P. regilla* do in fact have the ability to distinguish kin from non-kin.

DEVELOPMENT, BEHAVIOR AND FEEDING OF THE LARVAE OF THE SPOTTED TUSSOCK MOTH, *Lophocampa maculata*. Kenneth G. Strothkamp¹ & Zoe C. Strothkamp² ¹Department of Chemistry, Lewis & Clark College, Portland, OR 97219, ²Sunstone Montessori School, Portland, OR 97219.

The development of *L. maculata* larvae from egg to cocoon formation was observed. Eggs were round, white, about 0.8 mm in diameter and were laid in clusters. Incubation was 12 days. Larvae were fed on big leaf maple, *Acer macrophyllum*. Larvae went through five instars, accompanied by significant changes in color and general appearance. Larvae were gregarious for the first 6 days of life but gradually became more solitary. Throughout the first 4 instars, larvae stayed on the underside of leaves, hidden from view. The fifth instar larvae, however, showed a strong preference for remaining on the top surface of the leaf. The 4th to 5th instar molt was carefully observed. The black covering of the head was lost first, revealing a bright yellow color to the “new” head, which darkened to black within several hours. Molting took about half an hour with an additional period of about 2 hours for the “hairs” to dry and assume their fluffy character. Beginning about 5 days prior to cocoon formation, behavior of the fifth instar larvae changed. Eating stopped or was greatly reduced and the larvae wandered about the cage for extended periods. Cocoon formation occurred over a period of eleven days and coincided with the onset of significantly cooler daytime high temperatures. Larvae tended to form cocoons in small clusters on the underside of leaves or the sides of the cage. Quantitative feeding experiments were conducted to compare leaf consumption (in square centimeters of surface area) in daylight vs. darkness. Results on three days, involving either 4th instar (two days) or 5th instar (one day) larvae, indicated equal amounts of food consumption day and night, within +/- 10%.

CHEMISTRY

Section Chairs:

Brian Gilbert
Linfield College

Michael Everet
George Fox University

CHEMISTRY - ORAL PAPERS

IMMOBILIZATION OF POLYOXOMETALATES TO ORGANICALLY MODIFIED SILICA. Andrea Cathers, Michael A. Everest, Department of Chemistry, George Fox University, Newberg, OR 97132.

Polyoxometalates are unique compounds widely used for catalysis and have also been found to be beneficial in some fuel cell systems. Many of these applications already involve or could benefit from

immobilizing the catalyst molecules on an inert substrate such as silica. Using evanescent-wave cavity ring-down spectroscopy we determined that these molecules do not adsorb to a clean silica surface, but readily adsorb to a surface that has been modified with an organic linker molecule. Specifically, 3-aminopropyl trimethoxysilane was found to be an effective linker for the immobilization of the polyoxometalate $K_6CoSiW_{11}O_{39}$ on a fused silica surface.

SELF-ASSEMBLY OF PHOTO-CROSSLINKED POLYSTYRENE THIN FILMS. Sailaja Chada, and Mingdi Yan, Department of Chemistry, Portland State University, Portland, OR 97201.

Creation of controllable self-assembled nanostructures using photo-crosslinking methods is reported. Surface nanostructures of concentric circles evolving from ordered porous structures were observed on spin-coated PS thin films when irradiated with UV light and exposed to toluene. This self-assembly of nanostructures was observed for different molecular weights, on various substrates and for different film thicknesses. UV-irradiation of PS thin films leads to crosslinked and oxidative degraded products. The nanostructures formed as a result of differential responses of the products to the solvent by a combination of phase separation and swelling.

SURFACE-ENHANCED RAMAN SCATTERING OF *p*-NITROBENZOIC ACID ON Ag/Au ALLOY COLLOIDAL METAL FILMS. Evan A. Hiles, Rachel Kaneta, Dr. Brian D. Gilbert, Department of Chemistry, Linfield College, McMinnville, OR, 97128.

The photoreaction of *p*-nitrobenzoic acid (PNBA) with Ag-Au alloy colloidal metal films (CMFs) has been studied using surface-enhanced Raman scattering (SERS). Colloidal metal films were prepared by citrate reduction of chloroauric acid and silver nitrate. Extinction spectra confirmed the formation of alloy colloids. The photoreduction of PNBA to form azodibenzoate (ADBA) on surfaces under ambient conditions with 532 nm excitation was monitored by observing the 1450 cm^{-1} peak of the photoproduct. It was observed that the rate and extent of the photoreaction decreased as the mole fraction of Au in the colloids was increased.

SURFACE-ENHANCED RAMAN SCATTERING OF *p*-NITROBENZOIC ACID ON Ag-COATED Au COLLOIDAL METAL FILMS. Rachel Kaneta, Evan Hiles, Dr. Brian D. Gilbert, Department of Chemistry, Linfield College, McMinnville, OR, 97128.

Photoreaction kinetics of *p*-nitrobenzoic acid (PNBA) on Ag-coated Au colloidal metal films (CMFs) were studied using surface-enhanced Raman scattering (SERS). PNBA was adsorbed to the CMFs by soaking them in 0.1 M PNBA. The photoreduction of

PNBA to form azodibenzoic acid (ADBA) on the prepared surfaces was observed in real time with SERS spectra (532 nm excitation) under ambient conditions. Spectral features consistent with ADBA were clearly observed, with the most significant growth within the first 10 min of irradiation. The intensity of a characteristic photoproduct band was monitored in order to measure photoreaction progress. An exponential kinetic curve was fit to the data and the rate constant was determined to be $0.13 \pm 0.01 \text{ s}^{-1}$.

PROBING ION TRANSPORT IN POLYACETYLENE IONOMERS THROUGH THE ANALYSIS OF ELECTRODE POLARIZATION. Fuding Lin¹, Yongjun Wang¹, Mark C. Lonergan², Department of Physics, ²Department of Chemistry, University of Oregon, Eugene, OR 97403.

Polyacetylene ionomers are Mixed Ionic/Electronic Conductors that form a good platform for studying the interaction between the transport of ionic and electronic carriers. The independent characterization of ion transport in the mixed conductor is important in understanding the interaction between ionic and electronic carriers. In this study, small signal AC impedance spectroscopy was used to probe the ion transport in both Cationically functionalized (P_C) and Anionically functionalized (P_A) polyacetylene ionomer employing an Au-Ionomer-Au sandwich geometry. Experiments were conducted in the frequency range of 2 mHz ~ 1 MHz and the temperature range of 298K ~ 398K. The data was analyzed using an electrode polarization (EP) model to estimate the DC ionic conductivity, mobile ion concentration, and high frequency limit dielectric constant of the material. The ion transport in both P_A and P_C were found to exhibit Arrhenius temperature dependence with similar activation energy, $E_a=0.93 \text{ eV}$ for P_C and $E_a=0.97 \text{ eV}$ for P_A . The DC ion conductivity of P_A at 308K is $7.8 \times 10^{-13} \text{ S/cm}$ while that of P_C at 308K is $1.1 \times 10^{-11} \text{ S/cm}$. The estimated mobile ion concentration in both P_A and P_C was found to be less than 1% of the stoichiometric concentration. The high frequency limiting dielectric constants of both materials were found to be in good agreement with the published results of polyacetylene. The thickness dependence of the characteristic frequency of the electrode polarization agrees well with prediction from the model.

SURFACE-ENHANCED RAMAN SPECTROSCOPY OF *P*-(DIMETHYL)AMINO-CINNAMALDEHYDE ON COLLOIDAL SILVER. Diane Morgan, Dr. Brian D. Gilbert, Department of Chemistry, Linfield College, McMinnville, OR, 97128.

Surface-enhanced Raman scattering (SERS) spectra of *p*-(dimethyl)amino-cinnamaldehyde (DMAC) are measured on colloidal silver. Assignments for the observed vibrational bands are proposed, together with the frequencies calculated using density functional theory (B3LYP level) with a 6-311G basis set.

FOURIER ANALYSIS OF SUPERLATTICE X-RAY REFLECTIVITY. Jourdain W. Roberts, Michael D. Anderson, David C. Johnson, Department of Chemistry, 1253 University of Oregon, Eugene, OR, 97403.

Low angle diffraction is a valuable tool to characterize the structure of films and nanolaminates. The positions of the low angle diffraction peaks are given by a modified form of Bragg's law that is corrected for the index of refraction of the nanolaminates. The intensities of these diffraction maxima can be explained using a Fourier Theorem of the electron densities of the nanolaminates. The differences in electron densities between the two layers making up the nanolaminate give rise to the Bragg reflections under consideration. We will show how it is possible to build a model using the Fourier transform of the electron density that predicts when systematic absences occur and show its application to a series of experimental data sets.

TAXANES IN WATER? Alex Samuels, Angela Hoffman, Chemistry Department, University of Portland, Portland, OR 97203.

Paclitaxel (Taxol®) is a cytotoxic compound that was originally found in the bark of Pacific yew trees, *Taxus brevifolia*. Today, Paclitaxel is an important chemotherapy agent used to treat lung, ovarian, breast, and other cancers. The most common technique is to extract the Paclitaxel or baccatin III from the tree or its clippings, eventually leading to the death of the tree. With refined techniques the current yield from one yew tree is about one dose of the drug. To increase the yield of Paclitaxel per tree, water drained through the soil or other growth medium was analyzed for Paclitaxel and other taxanes. These studies have shown promising results. By utilizing such techniques it is possible to get more taxanes out of every yew tree.

ATOMIC LAYER DEPOSITION (ALD) OPTIMIZATION OF Al_2O_3 THIN FILM PRODUCTION. Benjamin Silver, Michael Anderson, David Johnson, Department of Chemistry, and Materials Science Institute, University of Oregon, Eugene, OR, 97403.

Atomic layer deposition (ALD) is used in the semiconductor industry to deposit uniform thickness layers which are important for CMOS production. An ALD sequence consists of exposing a surface to a reactant that will react to form a self-limiting monolayer, purging with an inert gas, exposing the surface to a second reactant that will react with the first reactant on the surface, followed by a second purge. This process is repeated as many times as needed to produce the desired thickness of the product and can be used to evenly coat 3D objects. We will discuss the optimization of our deposition system, a modified Planar P400G, for the production of Al_2O_3 thin films on Si substrate. The Al_2O_3 -coated Si substrates are used for electrical properties measurement substrates in our group's quest to

design more efficient thermoelectric materials. Al_2O_3 is more electrically resistant than Si which increases the accuracy of such measurements. We reduced the individual cycle time from 82 s to 16.7 s, which turned a process that took 2.43 h to deposit 155Å into a process that took only 0.75 h.

SURFACE MOBILITY OF HEMOGLOBIN ADSORBED ON SILICA. Justin Wiens, Michael A. Everest, Department of Chemistry, George Fox University, Newberg, OR 97132.

Spatially resolved evanescent-wave cavity ring-down spectroscopy was used to study the surface diffusion of an adsorbed protein. The diffusion constant of human hemoglobin (HHb) adsorbed on a fused silica prism was found to be on the order of 10^{-10} cm^2/s . Experiments were carried out under pH 6–pH 7 conditions in phosphate buffer to reduce HHb desorption. Although the results indicate that the HHb spatial distribution changes over time by a statistically significant amount over a period of several hours, at this time we cannot say with certainty that surface diffusion is not mediated by desorption and re-adsorption. To our knowledge, this is the first application of cavity ring-down spectroscopy to the study of surface diffusion.

CHEMISTRY - POSTERS

SHAPE TUNABLE GOLD NANOPARTICLES FROM SOY LIPID TEMPLATES. Benjamin Ayres, Dr. Scott Reed Department of Chemistry, Portland State University, Portland, OR 97201.

The ability to tune the optical properties of metal nanoparticles by changing their size and shape make them an ideal and diverse tool for biomedical applications. Rod and pyramid shaped nanoparticles absorb near infrared light, which penetrates into deep tissue and presents a unique possibility of non-invasive treatment of maladies. Challenges remain to utilizing nanomaterials for *in vivo* medical applications. By selecting benign compounds as synthons for nanoparticles, it is predicted that toxicity can be greatly reduced. Furthermore, the resulting synthetic waste can be minimized and the process made more environmentally friendly and safe. We report nanoparticle-liposome composite materials that are stable, water soluble, and anticipated to be benign. Specifically, soy lecithin has recently been used to synthesize particles with these characteristics. These lipids are a cheap, readily available and non-toxic ligand for the synthesis of gold particles. Soy lipids form liposomes that function as nanoreactors in which particles form. Using Br^- , we have been able to adjust the shape and size of particles allowing for tuning of their optical properties. Using these naturally occurring ligands, a series of gold nanoparticles have been synthesized and characterized. The resulting nanoparticles are stable for long periods with little aggregation. UV-Visible spectroscopy and transmission electron

microscopy have been used to characterize size and shape of the resulting nanoparticles. It is believed a plethora of components contained in soy could also play a role in particle synthesis. Using time of flight - secondary ion mass spectrometry, we identify ligands present at the gold surface and will use this to assist in further manipulation of the nanoparticles.

GEOGRAPHY

Section Chairs:

Jeff Baldwin
Western Oregon University

GEOGRAPHY - ORAL PAPERS

WILDLAND FIRE IN THE PACIFIC NORTHWEST, 1970-2006. Delvin R. Bunton¹, USDA Forest Service, Ecosystems Management, Sandy, OR 97055.

Wildland fire is a part of the natural environment in the Pacific Northwest in spite of efforts during the past 100 to significantly reduce the number and size of those fires. Communities and people can be impacted by smoke and directly by fire. The Yacolt Burn in 1902, the large fires near Wenatchee in 1994, and the Biscuit Fire near Grants Pass in 2002 affected many people, burned for months, and resisted suppression until the weather changed. The seven-wildland fire agencies in the Northwest (five Federal and two State agencies) each report fires on the lands those agencies manage or protect. Few studies to date have attempted to assess the overall impacts of wildland fire on the land by merging the data from those agencies and analyzing report duplication to determine the actual area affected by those fires. The larger fire database also allows other analyses to determine hidden occurrence patterns that might be used to predict areas at risk from occasional wildland fire. This study will report on some of those patterns.

EFFECTS OF GLACIER SIZE ON DOWNSTREAM EXTENT OF GLACIAL WATER QUALITY CHARACTERISTICS. Janice A. Dougall & Andrew G. Fountain, Geography Department, Box 751, Portland State University, 97207-0751.

We assess whether the rate of change of glacial water quality variables with distance from glaciers scales with fraction of glacier cover relative to watershed area. In particular, tests aim to determine whether the change in fractional glacier cover with distance normalized by the square root of glacier area, called L^* , provides a

useful model for water quality change with distance. Temperature, electrical conductivity, turbidity, suspended sediment concentration, and major anions were measured along six glacial streams draining glaciers ranging in size from 0.2 km² to 12.9 km² on Mount Rainier, Washington, and Mount Hood, Oregon. Macroinvertebrates were sampled for in the near glacier reaches of two streams. Three non-glacial streams were sampled for comparison. Graphical, correlation and regression analyses were used to compare water quality variables with distance measures. Results indicate that change in temperature and conductivity follows the proposed model, while turbidity and suspended sediment concentration do not. The glacier itself is the dominant source of cold water with low conductivity, while turbidity and suspended sediment are also derived from channel surfaces. Downstream change in sulfate concentration on Sandy River also follows the proposed model. These results indicate that temperature and ionic concentrations scale inversely with glacier size and L*, which must imply diminishing glacial stream habitat with continued glacier shrinkage that results from climate change.

THE IMPACTS OF CLIMATE CHANGE AND URBAN DEVELOPMENT
ON THE RUNOFF OF THE ROCK CREEK BASIN, OR. Jon Franczyk,
Heejun Chang, Department of Geography, Portland State University, Portland,
OR 97201

Changes in climate and urban land cover can significantly alter the volume and timing of watershed runoff. An increase in mean temperature brought on by global warming is projected for the Pacific Northwest, which may result in an intensification of the hydrological cycle. This is expected to produce regional changes in the temporal and spatial distribution of precipitation, higher storm intensities, and reduced snowfall. As urban land cover expands within a basin, increases in impervious surfaces and storm drainage systems cause flashier and more channeled storm runoff with reduced groundwater recharge. Basins that have experienced a high degree of urbanization are considered to be more sensitive to these climate changes. While many of the previous studies have assessed either climate or urban growth impacts on stream flow, there have been few studies that have analyzed the combined effects of both factors. The Rock Creek basin, OR, located in the Portland metropolitan area, has recently experienced a large amount of population growth and urban expansion, with urban land covering approximately 60% of the watershed area by 2000. When using both climate and land cover change scenarios for 2040 for the Rock Creek basin, the runoff results showed an amplification of the impacts from either climate change or urbanization. The largest change to runoff came from the low-density sprawl urban development scenario, while high-density compact development urban growth produced the lowest runoff

change. These results have significant implications for the development of future water resource management policies in the Portland area.

LiDAR – WHAT CAN I EXPECT TO SEE?, Corey Plank, US Bureau of Land Management (OR/WA), 333 SW First Ave., Portland, OR 97204.

LiDAR data is typically seen as a hillshade surface. Detail is much greater than that seen using 10m DEM data. Raw data is viewed directly or processed to create various surface models. The most often used surface is the bare earth, but first return / highest hit data or second return data are useful for vegetation studies. While many subtle features are present, there are also artifacts of the collection process. This presentation covers features to expect due to dense cover, steep slopes, or lack of point density. The reasons behind the artifacts will be shown through explanation of the mechanics of collection, demystifying some of the jargon. Examples will show differences in leaf-on and leaf-off collection, and will describe the effects of pulse density.

GEOGRAPHICAL MEMORY OF WWII IN NORWAY: SITES, FORGOTTEN GROUPS, AND MEMORY. John D. Swann, Department of Geography, Portland State University, Portland, OR

Like much of Europe during WWII, the German occupation of Norway forced people into the difficult choice of whether to collaborate or resist. Moreover, the war created many groups of victims that have since been remembered or forgotten in the country's official history. Based on the field of memory studies, this presentation navigates the contested terrain of war memory on the Norwegian landscape. It examines how historical geographers study landscape and memory while examining the recent challenges to Norway's official war history as heritage versus history.

MOVING FROM THE CENSUS TO THE AMERICAN COMMUNITY SURVEY. Richard Lycan, Population Research Center, Portland State University, Portland, Oregon, 97207-0751.

You no doubt have seen recent press releases from the US Census Bureau providing current information on topics such as poverty and educational levels. Most likely are based on data from the American Community Survey or ACS. If you have worked with census data in the past you know that there were two surveys: a "short form" survey consisting of about seven questions and asked of all households and a "long form" survey which posed the numerous detailed questions about such topics as income, education, and housing values and asked of approximately one in six households. The ACS will replace the long form questionnaire in the 2010 census. The ACS data are gathered on a continual basis rather than every 10 years. The ACS

will offer a number of advantages: more current data, field surveys by professionals, and better follow up on partially completed surveys. It also will pose some problems for users: larger sampling errors, weaker control totals, and use of multi-year data averages. This paper will: (1) describe how the ACS works and how it differs from the long form census, (2) review what demographers and other professionals have been saying about using the ACS, and (3) present some issues related to geographical analysis and mapping of the ACS data.

LOCAL SPACES OF ENGAGEMENT: THE EFFECTIVENESS OF COMMUNITY RESISTANCE TO DEVELOPMENT IN HAWAII. Leslie McLees, Department of Geography, University of Oregon, Eugene, Oregon 97403.

The community of North Kohala on the Big Island of Hawai'i contains much of the cultural diversity the islands are known for, including large populations of Hawaiians, 'locals' (descendants of Asian plantation workers) and newer white migrants. Fairly remote from any population centers, and with a strong professed sense of community, residents have successfully united to resist pressure from outside interests looking to place commercial and industrial development projects in the area. Actors within the community have been able to localize environmental and indigenous global discourses in their arguments against these projects. Despite these successes, housing development, mostly by wealthy whites, has continued. This development has driven up housing and cost of living expenses for Hawaiians and locals who have lived there for generations, resulting in resistance by these groups to white immigration. This paper interrogates the conditions that contribute to or prevent effective mobilization by communities against these different development pressures. Communities can unite against outside development forces because the spaces they depend on locally are not threatened by engaging with resistance with higher scale discourses. Conversely, when the ideals of community mean that one has to confront a neighbor instead of an abstract, outside enemy, group solidarity breaks down. In this situation, local engagement is unsuccessful and cannot overcome the 'particularities of place' to successfully unite against development forces.

GEOGRAPHY INFLUENCES ON MAIZE SEED EXCHANGE IN THE BAJIO, MEXICO. Kimberlee J Chambers, Department of Environmental and Earth Sciences, Willamette University, Salem, OR 97301

Household surveys for 35 households in four villages were conducted in an effort to document the purpose, structure, and scale of seed exchange and the threats to it in the Mexican Bajío. Analysis of household surveys illustrate that seed exchange is a complex process not easily generalized. Based on the household survey data, the main

factors that distinguish seed exchange at the village level include whether or not the same seed was grown the previous year, what farmers look for in a seed source and where they have acquired their original seed. When the household survey data is analyzed based on gender, rather than village, different results are obtained. Variables that distinguish seed exchange for females are different than for males. Seed exchange networks and seed selection influences the genetic makeup of crops such as maize and plays a role in uniting communities and sustaining cultural practices. Understanding the mechanisms for seed exchange and the factors that influence exchange is important for the conservation of crop genetic resources in-situ.

THE BARE LIFE OF REFUGEES: SPACES OF EXCEPTION IN POST-APARTHEID SOUTH AFRICA. Lia Frederiksen, International Studies Program & Department of Geography, University of Oregon, Eugene, OR 97403.

As a result of the worsening political and economic situation in Zimbabwe, hundreds of Zimbabweans are flowing into South Africa daily. The South African Refugees Act of 1998 states that refugees in South Africa should be integrated into local communities. Due to the South African government's hesitancy to classify these persons as refugees, few provisions are being made for the settlement and integration of these persons into local communities. This paper contends that Zimbabwean refugees in South Africa exist in what Giorgio Agamben has called the state of exception, persons reduced to bare life and thus unable to make claims upon the state as asylum seekers. Agamben argues that this situation comes about through the suspension of the rule of law, which in turn constitutes the very definition of the political realm. Agamben argues that the sovereign exception includes bare life in the political realm precisely through its exclusion, thus creating a state of exception, which has both spatial and temporal manifestations. This paper will show the link between bare life, the state of exception, and the space of exception which Zimbabwean refugees occupy upon entry into South Africa. In sum, this paper proposes that Agamben's argument presents a salient analysis of the situation of Zimbabwean refugees in South Africa in its focus on the architectures of power, violence, and the rule of law.

A CLOSER LOOK AT RURAL DEVELOPMENT POLICY: PROSPECTS AND RECOMMENDATIONS FOR A "NEW" GREEN REVOLUTION IN AFRICA. Marie Javdani, University of Oregon

In 2007 the World Bank reported its plans to renew its development assistance efforts in Africa with a particular emphasis on agriculture and the implementation of what it refers to as a "New Green Revolution." Long has the debate raged between proponents of prescriptive agricultural policy, whose solutions for poverty and hunger alleviation are centered on export-based economic activity,

and those who defend subsistence farming as the road to self-sufficiency. This paper explores the intersection of the Washington Consensus and Green Revolution discourse with that of the proponents of agricultural biodiversity by examining policy papers from the World Bank and the economic theory behind them. By relating this to the actual experience of six farming communities in the Zomba district of Malawi, this paper shows that while the economic benefits of certain cash-cropping practices can be substantial, many farmers find they must continue to be self-reliant for food production in order to protect themselves from changes in international market prices. When exclusive conformity to prescribed export-oriented production policy is enforced, the result is increased nutritional vulnerability for the producers. It is vital that the disparity between economic theory and results in reality be bridged before the World Bank can begin to achieve success with the "New" Green Revolution.

GEOGRAPHY - POSTERS

OREGON BICYCLING GUIDE: REDESIGNING A STATEWIDE BICYCLE MAP. Mike Engelmann, Nick Martinelli, UO InfoGraphics Lab, Department of Geography. University of Oregon, Eugene, OR, 97403.

The Oregon State Bicycle Guide includes a large-format statewide bicycle map. The guide, last published in 1999, is in need of updating in both content and design. The design of statewide bicycle maps varies greatly from state to state, and many states do not have an official state bicycle map or guide. Of the states that do, some include information about preferred bicycle routes through regional maps of those routes, while other states provide a statewide map in the same format as their regular highway map but modified for bicyclists. Oregon falls into the latter category. At the statewide scale, such maps primarily perform a trip plan or information-gathering function. Local or out-of-state bicyclists can get a free copy of the map from Oregon's Department of Transportation (ODOT) and plan a tour route using the map. A statewide bicycle map must provide information about routes that is important to bicyclists, including conditions such as average traffic volume, shoulder width, road surface and type, and information about dedicated bike lanes. This poster highlights the challenges of creating an easily-readable and information-rich display through effective use of graphics and symbology. The mock-ups shown here represent an effort to shift the general trend of bicycle maps away from emphasizing the more hazardous areas, and towards highlighting the positive bicycling opportunities available in our state.

GEOLOGY

Section Chairs:

Scott Burns
Portland State University

Jeff Myers
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GEOLOGY - ORAL PAPERS

PREPARING WOU FOR THE BIG ONE. Jeff Myers, Laura Fitzgerald, and Alyssa Pratt, Department of Earth and Physical Sciences, Western Oregon University, Monmouth, OR 97361, myersj@wou.edu

The 1993, Scotts Mills earthquake jolted Willamette Valley communities to the realization that moderate and large magnitude earthquakes on faults within the valley pose a real and imminent hazard. Strike slip faults pervade the region, produced as the Pacific Plate pulls western Oregon northward. Many structures used materials and designs that would fail in even a moderate-magnitude quake. In 2005, the Oregon Senate mandated that large capacity public buildings be visually surveyed and retrofitted to withstand likely quakes. "Sidewalk surveys" revealed that several structures on the Western Oregon University campus are constructed of unreinforced masonry or include obvious design flaws. The western wing of the WOU Humanities and Social Sciences (HSS) building stood upon an unenclosed "soft story" supported by reinforced concrete pillars unable to withstand earthquake ground motion. Yumei Wang of the Oregon Department of Geology and Mineral Industries (DOGAMI) obtained FEMA funding to retrofit HSS by enclosing the "soft story", strengthening the building's foundation, and wrapping pillars with epoxy-fiberglass mesh to prevent catastrophic failure. Students Alyssa Pratt and Laura Fitzgerald work with Jeff Myers, DOGAMI, WOU, and state and federal agencies to photo-document the HSS retrofit, and to build earthquake awareness at WOU. Press releases and student newspaper pieces discuss the HSS retrofit; and a brief survey assessing earthquake awareness was administered to several hundred WOU students in introductory Earth Science classes. Preliminary outcomes suggest that WOU students know how to protect themselves in an earthquake, but, surprisingly, reveal that few are aware of earthquake hazards posed by inadequate construction materials and designs.

LANDSLIDE SUSCEPTIBILITY MAP FOR SHALLOW LANDSLIDES FOR THE WEST HILLS OF PORTLAND, OREGON USING GIS AND LIDAR. Marina Drazba and Scott Burns, Department of Geology, Portland State University, Portland, Oregon, 97207

The West Hills of Portland, Oregon, USA (45° 33' N, 122° 45' W) are prone to landslides on the steep slopes covered in loess (ML soils) overlying basalt. The relatively simple geology, the propensity for landslides, the accurate LiDAR base map and the landslide database make the West Hills an ideal place to produce a landslide susceptibility map for shallow (25 ft. or 7.6 m. >) landslide using the approach of study by Harp et al. (2006). The landslide database was used to correlate the susceptibility map with the actual area of the landslides to ascertain the accuracy of the output susceptibility maps. The output maps were calculated using an algorithm based on the Infinite Slope Model modified by Harp et al. (2006) using Portland Hills Silt soil- strength data. The soil values used for the shear strength of the loess were 28° and 32° for the friction angle phi (phi = $27.8 \pm 3.8^\circ$, with a range of 18 – 32°), cohesions of 270 and 320 psf (cohesion = 270 ± 250 psf, with a range of 0-698 psf) and landslide thickness of 4 and 7 ft ($t = 4 \pm 3$ ft., based of the scarp height of 5 ± 4 ft.). The model was especially sensitive to changes in thickness, and to a lesser extent phi and cohesion.

THE OREGON LIDAR CONSORTIUM: INCREDIBLY COOL, HIGH RESOLUTION IMAGING OF THE NATURAL AND BUILT ENVIRONMENT. Ian Madin, Oregon Department of Geology and Mineral Industries 800 NE Oregon St. # 28, Portland,OR 97232

The 2007 legislature charged the Oregon Department of Geology and Mineral Industries with the task of collecting high quality Light Detection and Ranging (LiDAR) data for the state and provided seed money for a consortium approach to funding the data collection. The program is developing funding partnerships to fly large blocks of the state, starting with the south coast and Willamette Valley. The data to be collected will be high resolution (8 pts/m²) and high accuracy (15 cm RMSE in x, y and z), and will include point cloud data, bare earth and first returns DEM grids, bare earth point files and intensity images. Modern high resolution LiDAR imagery provides information that can be used in a wide range of natural resource and engineering applications that need a detailed and accurate 3-D map of the world. In western Oregon, the capability of LiDAR to image detail of the shape of the bare earth beneath vegetation is particularly useful. Some example applications include:

- Mapping landslides and debris flows
- Mapping timber stands
- Mapping stream channels and profiles
- Mapping powerlines
- Finding abandoned logging railroads
- Archeological investigation

- Identifying wetlands

Data is already available for parts of Oregon and more will be coming soon. Opportunities for participation in the Oregon Lidar Consortium are still available.

DETERMINING LANDSLIDE SUSCEPTIBILITY ALONG NATURAL GAS PIPELINES IN NORTHWEST OREGON, USA. Joshua I. Theule¹, Scott F. Burns¹, and H. Jack Meyer², ¹Portland State University, Geology Department, PO Box 751, Portland, Oregon, 97207, ²Northwest Natural, Portland, Oregon

Landslide susceptibility can be determined by integrating a spatial and linear analysis with geologic units, geologic contacts, and slope. The study area runs along three natural gas transmission pipelines passing through ancient landslides, steep terrains, and weak bedrock geology with rainfall amounts reaching 508 cm per year. The natural gas pipelines run 300 km across mostly the Cenozoic basalts and marine sediments of the Oregon Coast Range with 270 landslides mapped in a 1.6 km width corridor. Ranking 59 geologic units within the pipeline corridors according to landslide area density per geologic unit and critical slope angles per lithologic unit creates a spatial susceptibility map. Geologic units have been grouped according to lithology (basalts and volcanics, Quaternary, clay-shale, shale-sandstone, sandstone-conglomerates). These lithologic contacts were ranked according to percent length of landslide occurrence on 15 contact combinations. The thickness of the contact lines used for the susceptibility map was varied by determining the distribution of landslides within the lithologic unit (occurs or does not occur on a contact), the thicker the contact the more significant it is for landslide activity. Throughout this study results varied between pipeline corridors. Therefore, calculations for individual pipelines were used for analysis. However, what has been consistently found are that 97% of landslides in clay-shale landslides occur on its contact as well as 78% of landslides in basalt and volcanics occurring on their contacts. Shale-sandstone units are the least influenced units with having 50% landslides occurring on their contacts. The most susceptible geologic units (Tms, Taw, and Tgr1) are all involved with basalt cap rocks and underlying or interbedded marine sediment contact zones.

THE NORTH FORK LANDSLIDE OF MARION COUNTY, OREGON. Tony Bartruff, Department of Geology, Portland State University, Portland, Oregon, 97207

The North Fork Slide Area is a zone of active sliding located on a Marion County maintained road called the North Fork Road. The road has experienced several failures over a one mile stretch, located approximately seven miles east of the town of Mehama, Oregon. The Marion County Public Works Department recently converted the formerly asphalt road to gravel and installed new culverts in an effort

to mitigate the effects of sliding on the road. An investigation was conducted in order to ascertain the geology and mechanism of sliding, map slide extents, determine areas most hazardous to the road, and investigate additional methods of mitigation. A field reconnaissance survey was conducted to determine those areas of most concern to the road and map slide extents. Active movement was found in three areas of the roadway and mapped as slide areas A, B, and C. Correlating with the areas of concern were stream drainages running along side and under the road via culverts. Two of the three hazard areas were located on a cut bank of the Little North Fork of the Santiam River. Additional methods of mitigation suggested include removal of a logging slag pile uphill of an active slide, relocation of concrete barriers to remove weight from an area of apparent weakness, and possible buttressing of the river bank near a slide area. Bedrock geology of the area, soils characteristics, slope gradients, and the presence of water all appear to be contributing factors to the down slope movement of material near the roadway in all three hazard areas. During December thru early January 2007-2008, slide area A failed, destroying a substantial portion of the road within its boundary.

EROSION ALONG THE MOLALLA RIVER, CANBY, OREGON: SITE ASSESSMENT AND POSSIBLE MITIGATION FOR UNSTABLE SLOPES BETWEEN 775 AND 601 NORTH BAKER DRIVE, CANBY, OREGON. Mackenzie Keith, Scott Waibel, Portland State University, Geology Department., PO Box 751, Portland, Oregon, 97207

The area along the Molalla River between 775 and 601 North Baker Drive in Canby, Oregon is categorized as having a high potential for future erosion problems and bank loss. The properties are located on a terrace of the Molalla River consisting of Quaternary sediment and well-drained soils. Change in elevation between homes on the upper terrace and the river is approximately 80 feet. Primary factors influencing the calculated erosion rates of 0 to 3 feet per year, with greater erosion possibly exceeding the calculated value in wetter years, include steep slope angles, classification of vegetation, resident land use, and river migration. City storm water management has also been an issue for residents as it is linked to slope failures in 1998 and 2006. Assigning severity values from highest to lowest of 1, 2, and 3 to each property's various slope stability factors yielded a susceptibility map for the area designating 725, 711, 675, 661, and 601 as having the greatest potential for future failure. Based on cost and feasibility of incorporation, it is recommended residents discontinue current methods of disposing of yard waste by dumping over the bank, using tarps to protect slopes from additional watering from precipitation in the winter months, and planting vegetation commonly used in stream bank stabilization. Riprap at the base of the cliff is also recommended as a method of mitigation but would be

more difficult to achieve due to high costs, difficulty of physical installation, and the need for permitting.

GLACIATION OF THE RONGBUK VALLEY, MOUNT EVEREST, TIBET.
Robert J. Carson, Department of Geology, Whitman College, Walla Walla, WA 99362.

The Rongbuk Glacier extends approximately 16 km north from Mount Everest; the lower 6 km have abundant kettles in stagnant ice. A major tributary is the West Rongbuk Glacier; in the past the main valley glacier was joined by the Qutar and East Rongbuk Glaciers. The main glacial trough extends about 13 km north of the present terminus of the Rongbuk Glacier. On the valley floor are the braided Rongbuk River, mass wasting deposits, and four end moraine complexes; going down valley from the glacier, these are the Xarlungnama (Little Ice Age), Samdopo (Neoglaciation), Rongbuk, and Jilong moraines. Along the valley sides are outwash and alluvial fans and, higher up, stacked lateral moraines. Academia Sinica (1973) proposed four glaciations (including Neoglaciation) of the Rongbuk Valley, with the valley glacier depositing the Jilong moraine in the middle Pleistocene (about 29 km from Mt. Everest). Kuhle (1987) believed that the Rongbuk Valley held late Pleistocene recessional moraines from an outlet glacier fed by a Tibetan Plateau ice sheet. All later researchers denied the existence of an outlet glacier in the Rongbuk Valley, and agreed with early interpretations that the moraines were deposited by a valley glacier. Zheng (1988) argued for three glaciations with the Jilong moraine being late Pleistocene. Burbank and Kang (1991), using five weathering parameters, reduced the extent of glaciation by 4 km, and believed the Rongbuk moraine to be middle Pleistocene. In sharp contrast, Mann, Sletten, and Reanier (1996) reaffirmed that the Rongbuk glacier extended 29 km to the Jilong moraine, and argued that the Rongbuk moraine is late Pleistocene; they used weathering, soils, radiocarbon dates, and lichenometry. Based on geomorphology, weathering, a not-before-reported buried soil, and correlation with other central Asia moraines, it is concluded that: (1) the Rongbuk Glacier reached its maximum extent at the Jilong moraine in the middle Pleistocene; (2) considerable time elapsed between the deposition of the Rongbuk and Samdopo moraines.

CHANNELIZED DEBRIS FLOW IN MILK CREEK, MOUNT JEFFERSON, OREGON, NOVEMBER 6, 2006—PRELIMINARY RESULTS. Steven Sobieszcyk^{1,2}, Bethany Jackson³, and Chris Ricker², U.S. Geological Survey, Portland, OR, ²Department of Geology, Portland State University, Portland, OR, ³Maseeh College of Engineering & Computer Science, Portland State University, Portland, OR 97201.

On November 6, 2006, a large, channelized debris flow mobilized from the western slopes of Mount Jefferson into the Milk Creek

watershed. The debris flow formed during a severe storm system that brought warm temperatures and heavy rainfall to the Pacific Northwest. Rainfall measurements at Marion Forks and Santiam Junction showed that upwards of 19.3 cm (7.6 in) of rain fell the week leading up to the debris flow, with more rain (21.1 cm; 8.3 in) falling the 2 days afterward. The debris flow reworked and deposited material, including boulders and logs > 0.4 m in diameter, over a 0.28 km² (70 acre) area and sent 20,700 metric tons of suspended sediment downstream during that single day. The suspended sediment increased downstream turbidity in the North Santiam River above Detroit Lake to an estimated 30,000 Formazin Nephelometric Units. As the debris flow advanced, it dammed Milk Creek and rerouted most of its flow south to the newly formed “2% Milk Creek.” The debris flow likely started small as debris and ice calved off an upper valley snowfield, but “bulked up” as it eroded weakly consolidated deposits from previous debris flows, pyroclastic flows, and glacial moraines. About 30% of the deposit has thus far been surveyed. Based on transect measurements, the mean thickness for the surveyed area was 3 m. The remainder of the deposit was projected as having a mean thickness of 0.75 m to 1.50 m; therefore suggesting a total volume of 400,000 to 600,000 m (DATA ARE PROVISIONAL).

PROVENANCE OF MESOZOIC ROCKS IN EASTERN OREGON AND WESTERN IDAHO. Todd A. LaMaskin¹, Rebecca J. Dorsey¹, Jeffery D. Vervoort², ¹University of Oregon, 1272 University of Oregon, Eugene, OR 97405, ²Department of Geology, Washington State University, P.O. Box 642812, Pullman, Washington 99164

Controversy exists regarding terrane origins, relationships between terranes, and the timing and style of arc accretion in the Blue Mountains Province (BMP) of Oregon and Idaho. To address these controversies, we analyzed Triassic and Jurassic mudrocks from the BMP for major and trace-element geochemistry and sandstone samples for detrital zircon geochronology. Variations in the trace-element character of mudrocks indicate that during Triassic time, the Wallowa terrane was an intra-oceanic arc system and the Olds Ferry terrane was a pericratonic or fringing-arc system. These interpretations are supported by a lack of Precambrian-age detrital zircons in Wallowa terrane sandstones and their presence in Olds Ferry terrane sandstones. The data also indicate that a regional Jurassic basin received input from continental sources and may have been sourced from coeval terranes to the south. The BMP is situated between accreted terranes of southern British Columbia and the western U.S., and is critical for interpreting Mesozoic paleogeography of the U.S. Cordillera. Comparison of data from the BMP with similar data from terranes to the north and south suggests that the terranes of the western U.S. share a long-term provenance history and may be part of a complex system of continent-fringing and intra-oceanic arcs. In contrast, the Quesnel terrane of southern British

Columbia does not appear to share this long-term provenance history. Thus, the Quesnel terrane may have developed within a different island-arc complex. Similarity between Jurassic trace-element compositions of rocks from both Quesnelia and the western U.S. may indicate initial integration of the western Laurentian margin.

THEORY OF CRYOCONITE DEVELOPMENT. Toby Dittrich, Physics Department, Portland Community College, Portland, OR

Rocks that fall onto the surface of firm or ice on a glacier are called CRYOCONITES (cold rocks). As a result of their large absorptivity for solar radiation they exhibit a unique pattern of behavior on the surface. This behavior is masked by the randomness of the cryoconite distribution on the surface and therefore provides an excellent example of the use of the scientific method. The results of thirty years of observation of cryoconites on the Juneau Icefield (Alaska) will be presented.

NEW TRANSFER FUNCTIONS FOR ESTIMATING PALEOPRODUCTIVITY IN PALEOSOLS. Gregory J. Retallack, Department of Geological Sciences, University of Oregon, Eugene, Oregon, 97403

Paleosols are widely used as evidence for past conditions on land, including former levels of carbon dioxide in the atmosphere. The pedogenic CO₂ paleobarometer exploits very different carbon isotopic composition of CO₂ in air diffusing into soil and CO₂ produced by soil respiration (secondary productivity) within the soil. The transition between these values is deep within soils when atmospheric CO₂ levels are high and shallow within soils when atmospheric CO₂ levels are low. The calculations require estimates of soil partial pressures of CO₂ from secondary productivity, which until now have been unobtainable directly from paleosols. Both depth to calcic horizon in paleosols and CO₂ levels in soils are known to be related to mean annual precipitation in hundreds of modern soils. Some 157 measurements of 14 modern soils of known calcic depth whose CO₂ levels have been studied can now be used to derive a relationship between depth to calcic horizon (D in cm) and late growing season CO₂ levels (C in ppmv) according to the following equation (with standard error ± 937 ppmv and R²=0.79): $C = 67.25D + 999.62$. Some 8 measurements of 4 modern soils of known depth to gypsum (G in cm) can be used to derive a comparable relationship for gypsic soils (with standard error ± 381 ppmv and R² = 0.83): $C = 43.05G + 262.97$. Depth to gypsic and calcic horizons in paleosols needs to be corrected for burial compaction due to overburden. Use of this transfer function in Permian and Triassic calcareous paleosols from South Africa gives atmospheric CO₂ estimates comparable with those from stomatal index of fossil plants.

MAMMAL BODY SIZE TRENDS IN THE MIOCENE OF OREGON AND NEVADA. John D. Orcutt, Department of Geological Sciences, University of Oregon, Eugene, OR 97403

The effects of climate on biotic change remain poorly understood, in spite of their importance in predicting the outcomes of anthropogenic global warming. Previous paleontological studies have focused primarily on patterns in taxonomic diversity, though ecophenotypic traits exhibit a more predictable relationship with climate. Mammalian body size is a particularly useful ecological trait, both because its relationship to climate has been studied extensively in extant taxa and because it can be easily estimated even from incomplete fossil specimens. This analysis focuses on trends in mammal body size throughout the Miocene, encompassing periods of both global warming (the mid-Miocene climatic optimum, 18-15 Ma) and global cooling (15-5 Ma). Body size was approximated by first lower molar area, and measurements were taken from the literature for equids (horses), canids (dogs and their relatives), and sciurids (squirrels) from Oregon faunas and their stratigraphic equivalents in northwestern Nevada. The results show body size remaining static throughout the Miocene, counter to the predictions made by Bergmann's rule, which posits that cooler climates should favor larger-bodied mammals. While this is may be only an artifact of sampling bias, it may also represent the effects of local climate, perhaps influenced by volcanic activity associated with the Columbia River basalts and the Yellowstone hot spot. Future studies of other Miocene mammal faunas will allow these results to be viewed within a larger context.

GEOLOGY POSTERS

BEFORE THE MISSOULA FLOODS: PRE-LATE WISCONSIN OUTBURST FLOODS AND THEIR PATHWAYS. Kate Farrington and Pat Spencer, Department of Geology, Whitman College, Walla Walla, WA 99362.

While the Missoula Floods are now a well-known series of cataclysmic glacial outburst floods that swept through eastern Washington at the end of the Pleistocene, there is evidence for much earlier floods of similar proportions that have received much less attention. These floods are thought to range in age from about 750 ka to about 150 ka, which is much older than the Missoula Floods, which occurred between 15 ka and 13 ka. The provenance and pathways of these earlier floods are uncertain. Some sites containing these deposits have been investigated, but there is much room for expansion of this knowledge. In the sediment samples from our three study sites, micaceous sandy and silty layers as well exotic clasts of mostly quartzite and granitic lithologies confirm the deposits as extrabasinal. The presence of larger clasts in fairly fine-grained deposits suggests ice rafting and supports the interpretation that these are the deposits of glacial outburst floods. The presence of numerous

quartzite clasts leads us to speculate that the provenance of these floods was quite different from that of the Missoula Floods, which have an abundance of intrusive igneous lithologies in places where large exotic clasts are found.

DATING AND UPLIFT RATE OF THE WHISKEY RUN TERRACE AT DEVILS CHURN, OREGON. John C. Hook, Patrick K. Spencer, and Robert J. Carson, Department of Geology, Whitman College, Walla Walla, WA 99362.

The Whiskey Run Terrace is exposed at several localities along the Oregon Coast, including Cape Perpetua and Seal Rock State Park. To the north, along Beverly Beach and at Otter Crest, a marine terrace is developed whose relationship to the Whiskey Run Terrace is uncertain. At Cape Perpetua, the terrace is eroded across Eocene volcanic breccia and lava flows of the Yachats Basalt, and is overlain by 1 to 3 meters of shingle deposits consisting of well rounded pebbles and sands. At Devils Churn, the terrace is partially covered on the landward edge by landslide colluvium and beach deposits. Organic material from colluvium one meter above the terrace surface yielded a calibrated radiocarbon age of $43,621 \pm 803$ ybp. This date correlates well with another date for the terrace at Seal Rock. Using LIDAR and other data, detailed surficial and bedrock geologic and geomorphic maps for the terrace have been constructed. We have been able to calculate the rate of uplift subsequent to terrace development, and the relationship of deformation at Cape Perpetua to other sites along the Oregon coast experiencing uplift at the same time.

PILOT ROCK, A LATE OLIGOCENE WESTERN CASCADES ANDESITE INTRUSIVE, SOUTHERN OREGON. Lia Knauss, Manuel Silva, and Jad D'Allura, Environmental Studies/Geology, Southern Oregon University, 1250 Siskiyou Blvd, Ashland, OR 97520

Pilot Rock, a local landmark of historic significance, is a columnar-jointed hornblende-pyroxene andesite intrusion into easily eroded Oligocene andesitic volcanoclastic rocks. Although once considered a volcanic flow, evidence of the intrusive nature of the body include a sharp vertical contact on its NW side, vertical baking, and radiating dikes, not all of which are the same composition as that of Pilot Rock. An $^{40}\text{Ar}/^{39}\text{Ar}$ date on groundmass hornblende yields a radiometric date of 25.59 ± 0.21 Ma (Late Oligocene), a date that is marginally younger than the rocks it intrudes. There are no pyroclastic deposits or lava flows with the same distinctive hornblende-bearing composition of Pilot Rock leading to the conclusion that the intrusion never reached the surface. Hornblende-bearing dikes of similar composition intrude a N.50W. fault set as well as the N.80W. set intruded by the Pilot Rock andesite. Both fault sets affected lithified volcanoclastic rocks during a Late Oligocene brittle failure event. Petrologic analysis reveals a complex

history involving crystallization of hypersthene then augite and hornblende, rapid rise and devolatilization of hornblende, and groundmass crystallization. Plagioclase phenocrysts show a companion history with alternate dissolution and rapid crystallization textures. XRF analysis reveals typical continental margin major and trace element chemistry. The volcanic pile and intrusion, affected by low grade zeolite facies metamorphism, has been tilted $\sim 20^\circ$ to the east.

NATURAL HISTORY OF JUNIPER CANYON, OREGON. Gwen A. Leslie and Robert J. Carson, Department of Geology, Whitman College, Walla Walla, WA 99362.

Juniper Canyon is a unique nine-mile long tributary canyon to the Columbia River at Wallula Gap in northeastern Oregon. Located on U.S. Highway 730 just south of the Washington/Oregon state line, Juniper Canyon is part of the McNary National Wildlife Refuge. The creek incised Juniper Canyon into Miocene Columbia River basalts. During the Pleistocene, outburst floods from glacial Lake Missoula partially filled the canyon with giant eddy bars of gravel and left scattered erratic boulders more than 200 m above the level of the Columbia River. After the floods, the creek recut Juniper Canyon through the gravel bars. Loess blankets the uplands, and sand dunes have migrated here from the Umatilla Basin. With less than 25 cm of mean annual precipitation, the ecology here is greatly affected by aspect. The wetter north-facing slope has juniper trees, a number of native shrubs, and a fragile cryptobiotic crust, while the sunnier and drier south-facing side is mostly devoid of vegetation except for native and exotic grasses. The canyon floor contains wetlands created by McNary Dam on the Columbia River and by beavers. Environmental issues such as exotic species management, grazing, wildfire management, and dam construction are significant here.

EXAMINING THE GEOCHEMISTRY OF NATURAL WATERS UNDERLAIN BY MASSIVE SULFIDE DEPOSITS NEAR THE BLUE LEDGE MINE, SISKIYOU COUNTY, CALIFORNIA. Levi K. McKay, Nicholas P. Brettner, and William S. Elliott, Jr., Department of Geology, Southern Oregon University, 1250 Siskiyou Blvd., Ashland, OR 97520.

The Blue Ledge Mine exploited a polymetallic massive sulfide deposit, producing over 60,000 tons of waste rock. Acid Mine Drainage (AMD) from the mine empties into nearby Joe Creek, lowering the pH and inducing toxic metal loading. The purpose of this study is to investigate the natural production of acid rock drainage from the undisturbed massive sulfide deposits along strike from the Blue Ledge Mine. Eleven sampling sites are monitored from Cook and Green drainage to the south and Joe Creek drainage to the north, both with headwaters sourced from natural areas underlain by the sulfide deposits. The pH of all sampling sites ranged from 5 to

7.5, total dissolved solids from 54 to 138 ppm, and temperatures from 3.7° to 8.8°C for samples collected in fall 2007. Water samples were prepared using EPA Method 3005A and metals concentrations (As, Cd, Cu, Fe, Pb, and Zn) were then determined using an Inductively Coupled Plasma Optical Emission Spectrometer. Maximum concentrations of 182 µg/L for cadmium, 247 µg/L for copper, 50 µg/L for lead, 762 µg/L for iron, and 1006 µg/L for zinc were measured for the collected samples. The concentration for arsenic in all samples was below detection limits (10.0 µg/L). The elevated concentrations of cadmium, copper, iron, lead, and zinc in these natural waters suggest that these waters were impacted by natural leaching of the sulfide deposits. These concentrations, however, are much less than the AMD from the abandoned Blue Ledge Mine.

TREE-RING RECORDS OF LATE HOLOCENE CLIMATE CHANGE IN THE HANGAY MOUNTAINS, CENTRAL MONGOLIA. Laurel E. Stratton¹, Karl W. Wegmann², Robert J. Carson¹ Scott A. Mensing³. 1 Department of Geology, Whitman College, Walla Walla, WA 99362, 2Department of Earth and Environmental Sciences, Lehigh University, Bethlehem, PA 18015. 3 Department of Geography, University of Nevada, Reno, Reno, NV 89557.

The Egiin Davaa region of the Hangay Mountains in central Mongolia is an area with a well-preserved record of Pleistocene glaciation. The modern climate does not allow glaciers but low temperatures support a periglacial environment with palsen fields, cryoplanation terraces, and permafrost within 1 m of the surface. Modern vegetation communities include scattered Siberian larch (*Larix sibirica*) forests with limited vertical range (≤ 150 m) on north-facing slopes, common small willows (*Salix* spp.), uncommon birch (*Betula* spp.), and one observed juniper (*Juniperus* sp.). Dendroclimatological analysis of cores obtained from living *Larix sibirica* in the Egiin Davaa region of the Hangay Mountains provides a more than 600-year record of changing conditions in the Hangay. Results from larch cores collected from a periglacial environment at elevations between 2197 and 2636 m suggest that the trees are water stressed and thus probably responding to and recording precipitation variations in their growth patterns. High growth during the late 18th and early 19th Centuries and very high growth during the 20th Century appear to indicate wet periods in the Hangay, while falling growth rates since about 1965 correlate with a period of multiple recorded droughts throughout Mongolia. Additionally, spectral analysis yields a prominent periodicity of 54-57 years.

RAPID EROSION OF RESERVOIR SEDIMENT FOLLOWING REMOVAL OF MARMOT DAM, SANDY RIVER, OREGON. Johannah Withrow-Robinson and Bob Carson, Department of Geology, Whitman College, Walla Walla, WA 99362.

Marmot Dam, a 13-meter high concrete diversion dam located on the northern flank of Mt. Hood, was removed by controlled blasting in July, 2007. A coffer dam upstream diverted water around Marmot Dam until excavation of the concrete structure was complete. On October 19, 2007, the gravel coffer dam was breached in a high water event; at approximately 5:45 P.M., a knickpoint was initiated with the aid of backhoes. This knickpoint eroded rapidly upstream through the unconsolidated reservoir sediments at an initial rate of approximately 3 meters per minute. By the morning of October 20, the knickpoint had migrated hundreds of meters upstream, removing nearly one million cubic meters of sediment, and the rate of upstream retreat had decreased. To calculate the rate of knickpoint migration, we analyzed still and time-lapse photos taken at the removal site to determine the location of the knickpoint in relation to fixed points. Documenting knickpoint retreat and sediment transport at the Marmot Dam site is relevant to the planning and management of dam removals on mountain streams across the western United States.

HEALTH SCIENCE

Section Chairs:

Satin Salehi
Oregon State University

HEALTH SCIENCE – ORAL PAPERS

CHRONOTROPIC ACTIVITY OF BERBERINE ON CULTURED NEONATALE MURINE CARDIOMYOCYTES. Satin Salehi, Shannon R. Long, Philip J. Proteau, and Theresa M. Filtz. College of Pharmacy, Oregon State University, Corvallis, Oregon, USA.

As a cardioactive compound, the natural product, berberine, exhibits variable positive and negative chronotropic effects in different species. The first aim of the present study was to investigate the effect of berberine towards spontaneously-contracting cultured neonatal murine cardiomyocytes. Our results indicate that berberine caused significant negative chronotropic effects on cultured neonatal cardiomyocytes. Berberine did not cause beta-adrenergic receptor blockade at concentrations which caused a significant decrease in contraction rate. Activation of muscarinic acetylcholine receptors is primarily responsible for negative chronotropy in the heart; thus, we wished to characterize the involvement of muscarinic receptors in berberine-induced negative chronotropic activity. For this purpose, we studied the effects of the muscarinic (M)-receptor antagonists, atropine or himbacine, on negative chronotropic property of berberine. Changes in contraction rate of cultured cardiomyocytes showed that both muscarinic antagonists significantly decreased the

effect of berberine to reduce the contraction rate of cardiomyocytes. Pertussis toxin (PTX), a Gi/o protein inhibitor, did significantly reduce the negative chronotropic activity of berberine. Finally, the binding affinity of berberine to muscarinic receptors of adult mouse heart membranes using [³H]QNB as a radioligand showed that berberine dose-dependently inhibited [³H]QNB binding to mouse heart membranes. Therefore, the findings of the present investigations suggest that the direct negative chronotropic property of berberine in cultured neonatal murine cardiomyocyte correlate with activation of muscarinic receptors.

EFFECTS OF DIFFERENT HAWTHORN EXTRACTS ON MULTIPLE ACTIVITIES IN MURINE CARDIOMYOCYTE. Satin Salehi, Shannon R. Long, Philip J. Proteau, and Theresa M. Filtz. Department of Pharmaceutical Sciences, College of Pharmacy, Oregon State University, Corvallis, OR, USA.

As a cardioactive compound, the natural product, berberine, exhibits variable positive and negative chronotropic effects in different species. The first aim of the present study was to investigate the effect of berberine towards spontaneously-contracting cultured neonatal murine cardiomyocytes. Our results indicate that berberine caused significant negative chronotropic effects on cultured neonatal cardiomyocytes. Berberine did not cause beta-adrenergic receptor blockade at concentrations which caused a significant decrease in contraction rate. Activation of muscarinic acetylcholine receptors is primarily responsible for negative chronotropy in the heart; thus, we wished to characterize the involvement of muscarinic receptors in berberine-induced negative chronotropic activity. For this purpose, we studied the effects of the muscarinic (M)-receptor antagonists, atropine or himbacine, on negative chronotropic property of berberine. Changes in contraction rate of cultured cardiomyocytes showed that both muscarinic antagonists significantly decreased the effect of berberine to reduce the contraction rate of cardiomyocytes. Pertussis toxin (PTX), a Gi/o protein inhibitor, did significantly reduce the negative chronotropic activity of berberine. Finally, the binding affinity of berberine to muscarinic receptors of adult mouse heart membranes using [³H]QNB as a radioligand showed that berberine dose-dependently inhibited [³H]QNB binding to mouse heart membranes. Therefore, the findings of the present investigations suggest that the direct negative chronotropic property of berberine in cultured neonatal murine cardiomyocyte correlate with activation of muscarinic receptors.

HISTORY, PHILOSOPHY & SOCIAL STUDY OF SCIENCE (HPSSS)

Section Chairs:

Dave Boersema
Pacific University

David DeMoss
Pacific University

HPSSS – ORAL PAPERS

JOEL WALKER HEDGPETH (1911-2006): HISTORY, PHILOSOPHY AND SCHOLARSHIP. Randall W. Smith, Department of Physics and the Environmental Sciences and Resources Program, Portland State University, Portland, OR 97207.

The history of marine biology and the American conservation movement includes the contributions of a remarkable scholar, Joel Walker Hedgpeth. In his lifetime of 94 years, he influenced a significant number of biologists and a greater number of citizens to participate in the scientific and political struggles of our time in a unique way. With his will, his humor and his precision with language, he skillfully brought scientific scholarship to a wide range of people, for both academic and citizen involvement. He influenced the direction of government, the conservation of coastal areas and several programs of the National Science Foundation. With a knowledgeable set of colleagues that included Edward F. Ricketts, Joseph Campbell, John Steinbeck, he improved educational concepts for taxonomy, invertebrate zoology and coastal zone conservation. Joel Hedgpeth came to Oregon in 1965 to assume the directorship of the new marine facilities in Newport, Oregon, the Yaquina Biological Laboratories. These were that portion assigned to the Departments of Oceanography and Zoology within the Marine Science Center. It was a bold step for Oregon State University. Joel Hedgpeth completed revision of the text, *Between Pacific Tides*, 4th edition, retaining the conservation ethic of Edward F. Ricketts. He influenced the development of the Federal Water Pollution Control Administration, the Department of the Interior predecessor to the Environmental Protection Agency. In a scholars lifetime, contributions may noted and honored, awards may be given and books, essays and papers acknowledged, but with a long life we also find unexpected synergistic effects that continue to mold academic life and the future thrust of our philosophy, the characteristics of a

remarkable mind. It is his direction for all humankind that we remember his contributions with respect and gratitude.

DARWIN VERSUS VERNADSKY: A STUDY IN THE THEORY-LADENNESS OF OBSERVATION. Terry Bristol. Institute for Science, Engineering, and Public Policy. Portland, OR 97214.

Darwin looked upon nature and, following the Malthusian metaphor, saw competition everywhere. Vernadsky looked upon nature and, repulsed by the Malthusian metaphor, saw an interdependent community – the biosphere. It has been argued that the difference in the biological systems they were observing – for Darwin, the Galapagos and for Vernadsky, the Russian Steppes – account for the differences in their interpretations and in their radically different explanatory frameworks. I argue that the competitive and cooperative frameworks are applicable to all biological and that what each observed and what each thought needed to be explained or understood depended on apriori commitments. Finally I will argue that the cooperative framework, the basis of modern ecology, is more fundamental and subsumes the competitive.

ORGANIZATION AND ORDER IN DENBIGH'S INVENTIVE UNIVERSE. Terry Bristol. Institute for Science, Engineering, and Public Policy. Portland, OR 97214.

This paper is stimulated by a re-reading of Kenneth Denbigh's *An Inventive Universe* (1975). Denbigh makes a strong distinction between order and organization, arguing that the latter is not reducible to or understandable in terms of the former. The distinction is crucial to current research programs concerning complexity, self-organization and emergence – all within the larger context of the attempt to make sense of any system that develops or evolves in a progressive sense. Denbigh gives us the contrasting images of the ordered crystal and the organized biological cell. Developing what Denbigh only points out, I argue that the concept of order represented in the uniformity of the crystal is tied to the symmetries of mechanics – and to naïve accounts of science and scientific method. Denbigh, whose research field is thermodynamics, points out that much of the confusion in understanding the 2nd Law and irreversible processes derives from formulating the problem and the observations in terms of order rather than organization. Irreversible processes have both temporal/historical and spatial/cosmographic consequents – products (viz., irreducible spatial and temporal complexity). The structural organization and history of the universe can only be made sense of in terms of irreversible organizing processes. Finally, as Denbigh notes, when we speak of the organization of a system we are able to ask: 'organized for what purpose?' This question, in general, doesn't make sense when applied to order. Clarifying Denbigh's hypotheses I

suggest that he is pointing to a theory of intelligent design grounded in a teleological formulation of engineering thermodynamics.

IS THERE A DIFFERENCE BETWEEN MY RECOGNIZING THAT I AM HAPPY AND MY RECOGNIZING THAT YOU ARE HAPPY: AN ASSESSMENT OF THE ASYMMETRY THESIS IN ALVIN GOLDMAN'S SIMULATION ACCOUNT OF FIRST PERSON MIND READING. William A. Rottschaefer, Dept. of Philosophy, Lewis and Clark College, Portland, OR 97219.

How do we know the minds of others and of ourselves? In his recent *Simulating Minds: The Philosophy, Psychology, and Neuroscience* Alvin Goldman proposes that we know the minds of others by means of simulation and our own minds by means of introspection. In doing so, he rejects a pure theory-theory account of mind reading, according to which we obtain knowledge of our own and others' minds using a folk psychological theory. Thus, Goldman's view postulates an asymmetry of means of cognitive access to our own minds and the minds of others, while theory-theory positions assume the means to be symmetrical. In this paper, I explore Goldman's asymmetry thesis, focusing on the lower level mind reading involved in face-based reading of another's emotions, in particular the account of such mind-reading that appeals to the operation of mirror neurons. On the basis of standard criteria for what counts as theoretical, I examine the extent to which on Goldman's account introspective access to one's own mental states is theoretical or non-theoretical. I argue that though apparently non-theoretical in character since it is postulated to be a directly cognitive process like perception, its most significant cognitive features suggest that introspection of one's own mental states is theory-laden. I conclude that on Goldman's simulation theory of mind reading, if any asymmetry exists between cognition of one's own mental states and cognition of those same states on the theory-theory account, the asymmetry is in process type rather than being cognitive.

MATHEMATICS & COMPUTER SCIENCE

Section Chair:

Timothy Thompson
Oregon Institute of Technology

MATHEMATICS & COMPUTER SCIENCE – ORAL PAPERS

THE GOOD AND BAD OF A CYBERWAR EXERCISE IN AN INTERNET SECURITY COURSE. Dennis Gosnell and Jens Mache, Department of Mathematical Sciences, Lewis & Clark College, Portland OR 97219.

In fall 2007, our Internet Security course used the book "Counter Hack Reloaded" by Ed Skoudis. The last three weeks were reserved for a cyberwar exercise, experimenting with attacking and defending. Teams of two students were each given a computer with a Red Hat 9 installation. Teams were required to maintain web and ssh servers. A script running on the judge computer tested these services about once a minute. Additional Windows and Linux computers were also set up as targets. All computers were connected to a switch which was disconnected from the Internet. The first phase of the exercise was hardening. Teams used firewalls and tried to secure their computers as best they could. Then came the attack phase. Three kinds of attacks were successful. First, some targets used an insecure trust relationship, such as the rsh service. Through spoofing and with the help of the netcat tool, teams gained access to the targets. Second, some teams were able to gain access to other teams' judge account. One method was gaining control of the switch and redirecting the judge's ssh connection. Another method was getting the passwords by exploiting weaknesses of the judge's computer and the judge script. Third, one team was able to get root on the other teams' computers with the do_brk Linux kernel exploit. A backdoor was then setup to maintain access. Ideas for improvement include more emphasis on logging and intrusion detection, as well as giving teams their computer on day one of the course.

WEB 2.0 AND USER-FRIENDLY INTERFACES FOR WIRELESS SENSOR NETWORKS AND THE INTERNET OF THINGS. Sam Stigler and Jens Mache, Department of Mathematical Sciences, Lewis & Clark College, Portland OR 97219.

Wireless sensor networks can create what Scientific American deemed "macrosopes," systems of small devices that can collaboratively detect events in the physical world, such as temperature, sound, vibration, motion or pollutants. Named to MIT Technology Review's list of "10 Emerging Technologies that Will Change the World," sensor networks combine potentially hundreds of low-powered, remotely-deployed mini-computers. They allow for an instrumentation of the physical world and thus enable the "Internet of Things." One barrier to wider adoption is the absence of user-friendly interfaces for a wide audience of users and laypersons. Our aim is to develop a user interface specifically aimed for the end user, assumed to not know much about these networks other than that they have sensors and can send sensor readings back to the user. Our user interface, instead of providing a great deal of "complicated numbers," will provide a quick and easy way for the user to see the current readings, as well as how they have changed over time. We are developing for the Mac platform, using Cocoa, Core Animation, and

the PubSub framework. The user interface will be based on a standardized RSS or Atom feed from the devices.

PHYSICS

Section Chair:

Scott Prahl

St. Vincent Medical Center

PHYSICS - ORAL PAPERS

DARK CURRENT GENERATION OF CCD PIXELS DURING ILLUMINATION. Justin C. Dunlap, Ralf Widenhorn, and Erik Bodegom, Department of Physics, Portland State University, Portland, OR 97207.

Noise due to thermally excited electrons has been an issue in digital imagers since they were invented. This so called dark noise is present in an image even without the presence of light. It registers as false signals in the imager and requires removal to obtain a more accurate picture. We present a study of two scientific grade Charge-Coupled Devices (CCDs) that investigates how the presence of light influences dark noise. For every pixel in the imager, we measured the dark current generated in dark frames, where there is no exposure to light, and we also measured the dark current generated when uniformly illuminated to light. We found a percentage of the pixels where the dark noise is altered by the presence of illumination on the imager. These pixels produced less dark noise in the presence of light than they did without light present. This is a complication as the standard method for correcting dark noise assumes that the pixels behave identical both with and without the presence of light. An analysis of the data taken at various levels of illumination reveals multiple groupings of pixels that behave similar to each other but not as traditionally expected. We take a look at the possibility and challenges of correcting for this behavior.

THE TEMPERATURE DEPENDENCE OF ELASTIC CONSTANTS OF NATURAL CORDIERITE. Thomas F. Krenzel^{1,2} and Eiken Hausstühl¹, ¹Institut für Geowissenschaften, Johann-Wolfgang Goethe Universität Frankfurt, 60438 Frankfurt am Main, Germany, ²Department of Physics, Portland State University, Portland, OR 97201.

Natural single crystals of cordierite with optical quality were orientated and prepared for the evaluation of the elastic stiffness constants c_{ij} and their dependence of temperature T_{ij} up to 1473 K

with the help of resonant ultrasonic spectroscopy (RUS). The determination of accurate temperature coefficients of elastic constants requires the correction of changes in sample dimension and density which depend on thermal expansion. The measurements of the three coefficients of thermal expansion of oriented samples were done with a gauge dilatometer. The evaluation of the elasticity tensor from RUS spectra was carried out by a least-squares program in which observed resonance frequencies are compared with the calculated frequencies of a freely vibrating specimen. A comparison with the experimental RUS spectra of the samples (150 - 1500 kHz) allowed to determine the correct sequence of their resonances and to solve the least-squares problem. The sets of elastic constants measured on different samples at ambient conditions are consistent with the data in literature. A steep decrease in frequency of distinct eigenmodes could be detected above 920 K which is associated with the escape of volatile components out of the cordierite structure and the concomitant occurrence of micro cracks. The escape of the molecular volatiles is a temperature and time dependent process which was additionally studied with Raman-spectroscopy and a thermal analysis.

STRUCTURAL FINGERPRINTING IN THE TRANSMISSION ELECTRON MICROSCOPE. Peter Moeck¹, Stavros Nicolopoulos², ¹Department of Physics, Portland State University Portland, OR 97207-0751, USA, ²NanoMEGAS SPRL, Boulevard Edmond Machterns No 79, Sint Jean Molenbeek, Brussels, B-1080, Belgium, Europe.

Two novel strategies for the structural identification of nanocrystals [1] from either a single high resolution (HR) transmission electron microscopy (TEM) image [2] or a single electron precession diffractogram (EPD) [3] are described. These strategies are demonstrated on both experimental and simulated HRTEM images and EPDs. On the experimental side, the structural information that can be extracted from a HRTEM image is the projected reciprocal lattice geometry, the plane symmetry group, a few structure factor amplitudes and phases, and an outline of the projected atomic structure to the limited resolution of the HRTEM (via a Fourier synthesis of the structure factors). Except for the structure factor phases and the outline of the projected atomic structure, the same kind of information can be extracted from an EPD, but the information that can be used for structural fingerprinting is in this case not limited to the resolution of the TEM. Searching for this kind of information in comprehensive databases [4] and matching it with high figures of merit to that of candidate structures allows for highly discriminatory identifications of nanocrystals, even without additional chemical information as obtainable in analytical TEMs.

[1] Peter Moeck and Phil Fraundorf, "Structural fingerprinting in the transmission electron microscope: Overview and opportunities to implement enhanced strategies for nanocrystal identification,"

Zeitschrift für Kristallographie **222** (2007), 634-645; expanded version: arXiv:0706.2021
[2] Ruben Bjorge, *MS thesis*, Portland State University, May 9, 2007; Journal of Dissertation Vol. **1** (2007), http://www.scientificjournals.org/journals/2007/j_of_dissertation.htm
[3] <http://www.nanomegas.com>
[4] <http://nanocrystallography.research.pdx.edu/CIF-searchable>

LOW COST NEAR-FIELD OPTICAL MICROSCOPE WITH 20 nm SPATIAL RESOLUTION. Derek B. Nowak, Justin Hiester, Deepak Vedhachalam, Zechariah K. Dzegede, Andrew J. Lawrence, Erik J. Sánchez, Department of Physics, Portland State University, Portland, OR

The ability to detect optical information from biological and material systems with resolutions of ~ 20 nm, below the diffraction limit of traditional light microscopes is of great interest of biologist and material scientists. Using the technique of Tip Enhanced Near-field Optical Microscopy, or (TENOM) (Sánchez, PRL. 1999), imaging with this resolution has shown to be possible. TENOM has shown these optical resolutions with simultaneous topographical information. This includes the ability to detect with both electronic state and vibrational bond information for single-molecule identification. TENOM utilizes an Atomic Force Microscopy (AFM) scanning method where the imaging probe has been modified to create a localized field enhancement. The microscope's ability to image in solution is an additional feature. Unfortunately, TENOM has not seen common day use as a research tool, due primary to the level of understanding needed by the user to create suitable probes and correctly operate the microscope. Our goal is to develop a TENOM based microscope controlled by a single low cost computer, simple control circuits using FPGA data acquisition, and simplified optical system allowing for imaging the fluorescence from almost any visible chromophore without changing filters or excitation wavelength. Our system will be an open source system design, using only off the shelf available components. This instrument will improve upon the nominal >75 nm resolution limit of today's Near Field Scanning Microscopes to a level that will allow identification of individual closely packed proteins in a biologically friendly environment.

IDENTIFYING AND CORRECTING CMOS IMAGER DARK CURRENT. William C. Porter,^a Justin C. Dunlap,^a Ralf Widenhorn,^{a,b} and Erik Bodegom,^{a,b}
^aDepartment of Physics, Portland State, Portland, OR 97207 and ^bDigital Clarity Consultants, Lyons, OR 97328

We present the dark current measured in a CMOS image sensor at temperatures ranging from 295 to 340 K. Analysis of this data suggests that there are at least two different sources of dark current –

one resulting in hot pixels whose response increases linearly with exposure time, and another resulting in hot pixels with high, constant counts for exposure times less than the frame time. Possible applications of this dark current information are discussed, including the calculation of dark current for all pixels on the chip. Dark frames taken with very low bias settings are also examined, with results indicating that dark current correction performed using these dark frames can result in negative pixel values. One method for correcting dark current using these frames is demonstrated.

ELASTIC PROPERTIES OF SPODUMENE AT HIGH PRESSURE. Peter Sondergeld¹, Baosheng Li², Michael A. Carpenter³, Department of Physics, Portland State University, Portland, OR 97201, ²Mineral Physics Institute, Stony Brook University, Stony Brook, NY 11794-2100, ³Department of Earth Sciences, University of Cambridge, Cambridge, CB2 3EQ, U.K..

Compressional wave velocities in three mutually perpendicular directions through single crystals of spodumene, $\text{LiAlSi}_2\text{O}_6$, were measured using ultrasonic interferometry during cold pressurization. Sample pressures of up to 10 GPa were achieved by using an octahedral cell assembly (Figure 1) inside a multianvil apparatus. Pressure calibrations (based on the phase transitions in bismuth), length and density corrections (using lattice parameter data from the literature) as well as bond-shift corrections (due to the contact material) were performed in the process of extracting single-crystal elastic constant data. Large and abrupt changes of the elastic constants (Figure 2) as well as steep increases in attenuation were observed in the vicinity of the transition point at ~ 3.2 GPa. A Landau free energy expansion in one order parameter has been developed to describe this first-order $C2/c \rightarrow P2_1/c$ phase transition. The complete set of elastic constants required for the model was determined at ambient conditions by resonant ultrasound spectroscopy. The Landau expansion reproduces the general form of the experimentally obtained elastic anomalies. An occurrence of this type of transition in a mantle phase would be expected to leave a distinct signature in seismic velocity profiles of the Earth's interior.

Figure 1: Octahedral cell assembly for the high-pressure run

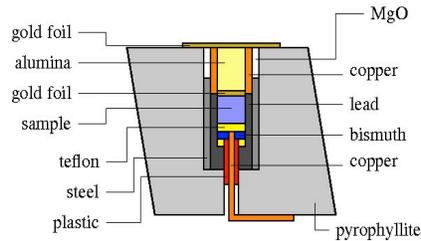
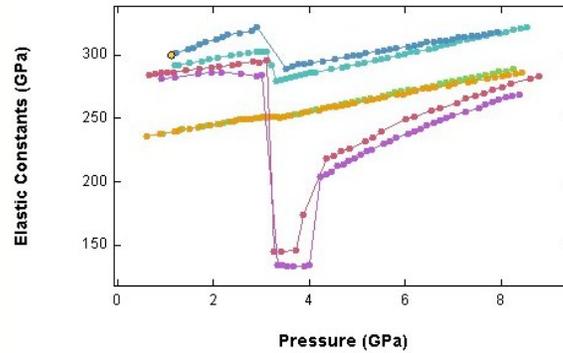


Figure 2: Discontinuous evolution of elastic constants in spodumene



PSYCHOLOGY

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Pacific University

PSYCHOLOGY – ORAL PAPERS

THE EFFECTS OF A SELF-EVALUATION TASK ON THE P300 EVENT RELATED POTENTIAL. Alvaro Hernandez, Daniel Lima, Stephanie Williams, Joel Alexander. Psychology Division, Western Oregon University, Monmouth OR 97361.

It has been demonstrated that self-identity stimuli (e.g., name, date of birth) produce an increase in P300 amplitude. Additionally, it has been shown that P300 amplitude is highly sensitive to emotional self-evaluation (Alexander, et al., 2005). The present study is a replication of the Alexander et al. 2005 study with more subjects and more electrode recording locations. The study was designed to capture an introspective moment during a task that required emotional self-evaluation related to an infrequent, random stimulus void of self-identity qualities. The design of the study was different from previous stimulus-driven self-identity stimulus studies in that the base sensory discrimination task was constant across all three conditions. All subjects started with a standard tone discrimination task (oddball)

during condition 1. In conditions 2 and 3 the subjects were required complete a secondary cognitive task in addition to the standard sensory discrimination task where they would be required to make a second stimulus-related judgment after their initial response. Condition 2 required subjects to index a mental count if the tone was a target, in addition to tone discrimination. Condition 3 required subjects to self-evaluated if they were surprised by the occurrence of the target tone given the random and infrequent nature of the target tone presentation. During these conditions ERPs were recorded across 32 electrode sites. Similar to the self-identity stimulus studies, results indicated a large increase in P300 amplitude during the condition with the self-evaluation component compared to the other conditions. These results imply that self-evaluation may utilize more cortical resources than non-self related cognitive-discrimination tasks.

ASSESSING MENTAL HEALTH NEEDS OF SCHOOL-AGED YOUTH IN A MULTICULTURAL COMMUNITY: THE CONSTRUCTION OF A MENTAL HEALTH NEEDS SURVEY. Jessica Bolton, Natalie Seibel, Casey Wixson, School of Professional Psychology, Pacific University, 511 SW 10th Avenue, Suite 400, Portland, OR 97210.

The objective was to review and address gaps found in the school-based mental health literature by developing a mental health needs survey and implementing the survey in an Oregon elementary school to identify preliminary mental health needs and barriers to mental health services as perceived by caregivers and school personnel in the community. A convenience sample of 15 school personnel and 73 parents were surveyed regarding perspectives of mental health problems among predominantly Hispanic school-aged youth found in a rural Oregon elementary school. Sample characteristics required the translation and administration of English and Spanish versions of the constructed measure to reduce linguistic barriers. Reliability coefficients for the various subscales on the Mental Health Needs Survey ranged from .82 to .99. A frequency analysis resulted in a high level of agreement between parents and school personnel regarding the most common mental health needs among the student population.

BRIEF, MANUALIZED EXPOSURE THERAPY FOR PANIC DISORDER WITH A KOREAN-AMERICAN CLIENT. Christopher S. Brown, Joshua Hughson, Pacific University School of Professional Psychology, Hillsboro, OR, 97123.

The modern health care environment increasingly demands brief, standardized forms of psychotherapy. Manualized treatments have allowed psychologists to meet these demands, but because most clinical research has been conducted using primarily Caucasian participants, there is insufficient data about the effectiveness of

manualized treatments with minority clients. This case study examines the rapid recovery of a Korean-American woman who participated in exposure therapy for Panic Disorder at an outpatient training clinic. Therapy modules included assessment, psychoeducation, relaxation training, and interoceptive exposure to the symptoms of a panic attack. The therapist tracked the client's progress using two self-report instruments with demonstrated psychometric robustness, including the Outcome Questionnaire (OQ-45.2) and the Panic Attack Cognitions Questionnaire (PACQ). These measures were analyzed using the formulae for clinical cutoffs and reliable change indices (RCI) devised by Jacobson and Truax. The client achieved reliable change at the third session and passed the clinical cutoff at the fourth. This case study provides an example of rigorous, data-driven, manualized psychotherapy with a member of an under-studied ethnic minority population.

THE POSSIBLE TREATMENT OF ALZHEIMER'S DISEASE WITH A MINDFULNESS INTERVENTION: A CLINICAL CASE APPLICATION. ALEX BLOOM. SONIA DHALIWAL. Pacific University, School of Professional Psychology, 2043 College Way, Forest Grove, OR 97116.

The objective of this oral presentation is to illustrate the different types of mindfulness-based interventions and techniques that may be applied to Alzheimer's disease patients throughout the progressive stages of the disease. A potential mindfulness-based treatment protocol will be applied to a hypothetical clinical case study of a patient throughout the first four stages of the disease. Specific mindfulness techniques used in this case study will be borrowed from both Jon Kabat-Zinn's (1990) Mindfulness-Based Stress Reduction (MBSR) and Mindfulness Based Cognitive Therapy (MBCT) treatment programs developed by Segal, Teasdale and Williams (2004). The application of these mindfulness based techniques is foreseen to decrease the level of emotional distress experienced by the patient during the first four stages of this progressive disease. To date, there is a lack of research applying mindfulness interventions to Alzheimer's disease patients; therefore future efforts to employ this preliminary treatment protocol on a clinical sample will be considered. The two main goals of this oral presentation are: 1. To introduce the various techniques within both MBCT and MBSR protocols. 2. Exploring the possible benefits of applying mindfulness-based interventions to Alzheimer's disease patients. 3. Creating opportunities for future research to be carried out in the field.

THE USE OF ASSESSMENT TO INFORM THERAPY. Kelly Fagerburg, School of Professional Psychology, Pacific University, Forest Grove, OR 97116.

Psychological assessment is a crucial aspect of the field of psychology. Among other applications, assessment can be used to

inform therapy. Diagnostic assessment, assessment of symptom severity, personality assessment, neuropsychological assessment, and cognitive ability assessment are all indicated for therapeutic application. One particular type of assessment is discussed with reference to this purpose, and three individual cases are highlighted.

AN EVALUATION OF THE EFFICACY OF COMPUTER-BASED PESTICIDE APPLICATOR TRAINING. Lindsey B. Patterson¹, Heather L. Fercho¹, Diane Rohlman¹, W. Kent Anger¹, Leda Garside², ¹Center for Research on Occupational and Environmental Toxicology, Oregon Health and Science University, Portland, OR, ²Salud! Services, Tuality Healthcare, Hillsboro, OR.

In Oregon, the passing rate on the state's private pesticide applicator license exam for Spanish-speaking workers is low (9.65%) compared to the passing rate for English-speaking workers (78.45%). Numerous pesticide applicator training classes exist, including the computer-based training examined here, in both English and Spanish, but there has been little research examining the efficacy of these trainings. The purpose of this study was to evaluate the effectiveness of the computer-based pesticide applicator training (PAT) by comparing the final test scores of the training to the scores on the Oregon State pesticide applicator certification exam. Twenty-eight participants took the Spanish-language pesticide applicator training using cTRAIN as well as the Oregon license exam. Fourteen participants took the training and exam in November, 2006, and 14 participants took the training and exam in August, 2007. Six of the 28 participants took the training and license exam both years. Following the 2006 study, changes were made within the training content and the training's final exam, making it more extensive and difficult. The relationship between the 2006 and 2007 scores was not significant, $t(13) = .39$ and $t(13) = .25$, $p > .05$. However, there was a .73 correlation between the 2007 PAT final exam score and the State certification test score. Thus the 2007 PAT final exam may be used to predict participant success and need for study of specific categories of information. Further research on the effectiveness of the computer-based training and classroom training as well as long-term observation of improvement is suggested.

COMPUTER-BASED VS. FACE-TO-FACE TRAINING: AN EVALUATION OF INSTRUCTIONAL FORMAT FOR SUPERVISOR TRAINING OF VINEYARD WORKERS. Alicia Alvero Ph.D¹, W. Kent Anger Ph.D², John Austin Ph.D³, Martha Fuchs², Allison McNamara⁴, Lindsey Patterson². ¹Department of Psychology, Queens College, The City University of New York, Flushing, NY 11367. ²Center for Research of Occupational and Environmental Toxicology Oregon Health and Sciences University, Portland, OR 97239. ³Department of Psychology, Western Michigan University,

Kalamazoo, MI 49008. ⁴Department of Biology Oregon State University, Corvallis, OR 97331.

Agriculture workers were given a computer-based training (CBT) in supervisor skills to evaluate its effect on skill development in a two-day face-to-face workshop with an experienced behavioral consultant on developing supervisor skills. Out of ten total 5 participants completed computer-based supervisor training and 5 completed computer-based hazard communication (hazcom) training as a control. All participants were either supervisors or in a position to become a supervisor in the vineyards where they worked. The mean age of the five participants who received hazard communication training was 27.4 years and it was 30.6 years for those who received supervisor training. The average years of education was 8.2 years for those receiving hazard communication and 6.2 for those receiving supervisor training. All participants were educated in Mexico and all were native Spanish speakers. Both the training and the two-day workshop were conducted in Spanish. After the CBT and prior to the face-to-face training, all participants were given a pre-test on supervisor skills. The same test was also given after the two-day workshop as a post-test. The mean of the pre-test for the group receiving the hazcom training was 46% and the mean for those taking the supervisor training was 52%. The mean scores improved on the post-test given after the two-day training to 51.4% for the control group and 65.2% for those receiving supervisor CBT. A t-test revealed that the pre-test scores were not significantly different between the supervisor and hazcom training groups, but the supervisor CBT group performed significantly better on the post test than the hazcom CBT group ($p=0.051$).

FURTHERING SCIENCE THROUGH COMMUNITY SERVICE AND TRAINING. ¹Derrin YK Fukuda and ²Alyson LM Williams, ¹School of Professional Psychology, Pacific University Health Professions Campus, Hillsboro, OR 97123, ²School of Professional Psychology, Pacific University Psychological Service Center, Portland, OR 97205.

A primary interest of training programs in scientific fields is to foster skills for promoting scientific endeavors through research. In psychology, a strong emphasis is placed on scientific method, but also on how it might apply to improve community service. This project is a reflection of the fruitful combination of furthering research, engaging in community service and fostering skills through training students simultaneously. The goal of this presentation is to lend hope to student scientists that they might contribute to their scientific field and gain valuable skills while providing valuable community service at the same time. The current project is funded by an internal Pacific University grant. Funds were allocated for conducting skills groups at a local elementary school that lost its funding for such services. A decision was made by faculty and students at the school of Professional Psychology to put together

curricula to meet the needs of these students that had previously been attended to. As such, the community service project led to student research as well as the potential to further our understanding of the utility of such groups by researching their success. This poster will outline the process of obtaining funds, proposing the project to this community school, making it a feasible scientific endeavor for students and also meeting graduate student requirements and potential scientific findings it may reveal.

STUDENTS' PERCEPTIONS OF GROUP PROJECTS AND COLLABORATIVE LEARNING IN COLLEGE ACADEMICS. Joseph R. Elcano, Anthony D. Hermann, Department of Psychology, Willamette University, Salem, OR 97301

Collaborative learning assignments have increased in college as a response to the change in the 21st century workplace where cooperation and teamwork are valued. Past research has investigated the characteristics of successful group projects and strategies that positively increase collaborative learning among students and yield favorable attitudes toward the projects. There, however, is little known about student perceptions and attitudes towards group work as they naturally develop throughout their college experience. The current study examined student attitudes about group projects as a function of the characteristics of those projects and the students themselves. A campus wide survey was issued to a representative sample of the students at private liberal arts college. Based on previous research, we predicted that the students would favor group work more if the instructor allowed students control certain aspects of their experience and provided a more structured experience. Preliminary analyses were consistent with our hypotheses. Students reported a more favorable attitude towards group work when allowed to form their own groups and when their instructor provided feedback to the group throughout the project. In addition, contrary to some claims in the literature about students' attitudes toward group work, analyses indicated that the more experience students have with group projects, the less favorable their attitudes toward them. Additional findings and suggestions for creating satisfying group projects will be discussed.

ASSESSING THE LONG-TERM EFFECTIVENESS OF ADOLESCENT RESIDENTIAL TREATMENT CENTERS. Mathew Hirsch, Derrin Fukuda, Amanda Klinger, School of Professional Psychology, Pacific University, Forest Grove, OR 97210.

Controversy surrounding the effectiveness of adolescent residential treatment centers (RTCSs) has existed for decades. Whereas a majority of adolescents seem to make significant emotional and behavioral improvements while in treatment, many adolescents are unable to maintain these treatment gains once discharged. In

addition, difficulties among the clinical placement processes and research processes have hindered the RTC effectiveness research. This literature review highlighted these clinical and research problems so that steps can be made to improve long-term adolescent outcomes following RTC discharge. An examination of the long-term follow-up studies yielded both positive and negative results. Adolescents discharged from some RTCs were able to maintain their treatment gains whereas adolescents discharged from other RTCs were unable to successfully transition into the post-discharge environment. Two major themes emerged from these outcome studies which seemed to increase the likelihood of adolescent long-term success: family involvement in treatment and providing of aftercare services. Implications on how to practically implement these factors are suggested as well as how to improve the clinical and research processes.

PUBLIC PERCEPTIONS VERSUS CURRENT RESEARCH REGARDING FUNCTION AND MEANING OF DREAMS. Jaime Houskeeper, Amanda Grovert, School of Professional Psychology, Pacific University, Forest Grove, OR 97116.

A review of the modern dream research literature and a small qualitative study of participants' beliefs regarding the meaning of dreams were contrasted. Current research suggests that dreams may be the result of the forebrain "interpreting" brainstem activity and data and has called into question the strength of the association made between random eye movement sleep (REM) and dream states. Conversely, the majority of survey respondents demonstrated a belief in pseudo-psychoanalytic dream theory. Hypotheses for the differences between the state of the research and public perception of the research will be presented and discussed.

RISKS AND PROTECTIVE FACTORS IN THERAPIST MENTAL HEALTH AND BURNOUT. Amanda Grovert, Jaime Houskeeper, School of Professional Psychology, Pacific University, Forest Grove, OR 97116.

A review of literature on burnout among mental health professionals and qualitative interviews with three respected individuals in the field of psychology were examined. The research yielded several factors that contribute to therapist mental health, including a strong support network and an ability to separate home life from work life. Personality factors of long term therapists are also discussed, using the Big Five Personality Inventory and the Rokeach Values Survey.

ATYPICAL RECOVERY OF AN ADULT FEMALE WITH SOCIAL PHOBIA. Josh Hughson, Christopher S. Brown, & Johan Rosqvist, Pacific University School of Professional Psychology, Hillsboro, OR, 97123.

Clients with social phobia exhibit elevated subjective estimates of the probability and cost of negative social events. Treatment for social phobia involves challenging these overestimates using cognitive therapy and behavioral experiments. As treatment progresses, clients' fear of general social interaction are expected to reduce before their fear of scrutiny during routine activities. This study presents the atypical case of an adult Caucasian female with social phobia who showed an inverse pattern of recovery. She was evaluated and treated with a combination of cognitive therapy, interoceptive exposure, behavioral activation, and in-session role-plays involving confederates. The client was assessed throughout treatment using the Social Phobia Scale (SPS), Social Interaction Anxiety Index (SIAS), and Outcome Questionnaire 45 (OQ45). Clinical cutoffs reliable change indices were used to evaluate treatment progress. This case study examines an atypical treatment course and introduces potential treatment modifications for similar cases.

MODIFIED EXPOSURE THERAPY FOR AN ELDERLY CLIENT WITH POSTTRAUMATIC STRESS DISORDER AND COMORBID MEDICAL CONDITIONS. Josh Hughson, Christopher S. Brown, & Johan Rosqvist, Pacific University School of Professional Psychology, Hillsboro, OR, 97123.

Exposure therapy is considered the "gold standard" treatment for Posttraumatic Stress Disorder (PTSD) and evidence suggests it may benefit elderly populations. However, research has not addressed the modifications required for using exposure therapy with elderly populations when comorbid medical conditions aggravate PTSD symptoms. In this case-study, a 65-year-old client with severe cardiovascular disease and PTSD that was untreated for forty years was evaluated and treated with a combination of cognitive therapy, imaginal exposure, behavioral activation, and stimulus control. The client was assessed throughout treatment using the Anxiety Sensitivity Index (ASI), Outcome Questionnaire 45 (OQ45), and Posttraumatic Cognitions Inventory (PTCI). Reliable change indices were used to evaluate treatment progress. The client exhibited a reliable decrease in symptom distress and an increase in social role adjustment within 14 sessions. This case study highlights treatment modifications that address complications caused by comorbid medical conditions in elderly clients.

EXAMINING TEST-RETEST RELIABILITY OF THE BEHAVIORAL ASSESSMENT AND RESEARCH SYSTEM IN ARABIC SPEAKING ADULTS. Ahmed A. Ismail^{1, 2}, Diane Rohlman¹. 1Center for Research on Occupational and Environmental Toxicology, Oregon Health and Science university, Portland, OR 97239, USA. 2Community, Environmental and

Occupational Medicine Department, Faculty of Medicine, Minoufiya University, Shebin Elkom, Egypt.

The Behavioral Assessment and Research System (BARS) is a computer-based testing system designed to assess neurobehavioral function in humans. It was initially targeted for use with a broad range of working populations with different education levels and cultural backgrounds. Instructions for the tests can be presented in multiple languages including Arabic. Previous research has demonstrated the reliability of the computerized tests across 6 hour and 1 week intervals in English-speaking adults. The aim of this study was to examine the reliability of the test system in Arabic speaking adults across four test sessions of increasing intervals of 2, 4, 6, and 8 weeks. Thirty, healthy, native Arabic speaking adults were recruited through public advertisements. All participants completed the BARS battery four times. Reliability was assessed by Interclass Correlation Coefficient (ICC), and analysis of variance (ANOVA). The majority of tests had good reliability and stability across the test sessions. Interclass Correlation Coefficients ranged from 0.41 to 0.96. The ANOVA test did not show any significant variation in the scores across the test sessions. These findings demonstrate the utility of the Arabic instructions and suggest that BARS may be a useful tool for the assessment of neurobehavioral performance status in both acute and chronic settings.

MMPI-2 PROFILE COMPARISON OF INTRAFAMILIAL AND EXTRAFAMILIAL SEXUAL OFFENDERS AGAINST CHILDREN. Tiffany F. Looney, & James B. Lane, School of Professional Psychology, Pacific University, Forest Grove, OR, 97116.

Previous research indicates that incest offenders and sexual offenders against unrelated children represent two clinically distinct subtypes. Specifically, incest is thought to be situationally-mediated and the result of dysfunctional family dynamics, whereas offenses against unrelated children are thought to represent a fixated sexual preference and underlying interpersonal pathology. Other studies have found that a fixated sexual preference for children is correlated with psychopathy. However, to date, no studies have attempted to assess these differences using the Minnesota Multiphasic Personality Inventory-2 (MMPI-2), despite its widespread clinical use with this population. In this study, scores of convicted perpetrators of sexual offenses against children were compared. Nine incest offenders were compared with six offenders of unrelated children. The extrafamilial offender group obtained higher mean scores on scale 4 of the MMPI-2, the Psychopathic Deviate scale. These results suggest that extrafamilial offenders have more psychopathic characteristics than do incest offenders, however the Psychopathic Deviate construct as assessed by the MMPI-2 is broad, and attempts to gain a more detailed understanding of what specific aspects of the construct applied to this population were unsuccessful.

THE EFFECTS OF MINORITY INFLUENCE AND GROUP DEVELOPMENT ON GROUP DECISION MAKING, Monique McCloud¹, Natalie Kollross¹, David A. Foster², Victor Savicki², School of Professional Psychology, Pacific University, Hillsboro, OR 97123, ²Department of Psychology, Western Oregon University, Monmouth, OR 97361.

More and more, organizations are coming to rely on work groups to accomplish major organizational goals; including decision making. The present study examined how minority opinion member influence, in combination with minority opinion member task competence and gender, impacted that quality of group decision making under different conditions of group development. The minority opinion member (MOM) of each group was determined by comparing the individual performance scores of all three group members obtained prior to their completion of the task as a group. The minority opinion member was operationalized as the group member whose score deviated the most from the score of the second most competent member of the group. By this definition, the minority opinion member was either the most or least competent member of the group. Data were collected from 92, three-person groups engaged in two intellectual, problem-solving scenarios. Individual and groups performance were assessed by comparing the decision against a known standard. The dependent variable was Group Added Value, the amount of variance in group performance after controlling for individual member competence. Univariate analysis of variance showed that groups where the MOM was the least competent group member performed significantly better than groups where the MOM was the most competent group member ($F=2.70, p<.05$). Additionally, MOM gender moderated the effects of feedback on Group Added Value ($F=3.03, p=.08$). Groups in which the MOM was male and received feedback had significantly higher levels of group added value compared to other groups. Implications will be discussed.

PATIENT AND FAMILY REACTIONS TO INTENSIVE EXPOSURE AND RESPONSE PREVENTION FOR CHRONIC, SEVERE AND REFRACTORY OBSESSIVE-COMPULSIVE DISORDER: STUDENT AND SUPERVISOR REFLECTIONS ON RESPONSES TO "LIVE TRAINING MODEL." Heidi Meeke, Bebyn Rowland, Johan Rosqvist. School of Professional Psychology, Pacific University, Portland, OR 97205.

Obsessive-compulsive disorder (OCD) is documented as a common anxiety disorder, with prevalence rates of approximately 3% in the general population. Left untreated this typically severe phenomenon remains excruciating and insidiously deteriorates into true debility, often grossly affecting multiple areas of functioning (i.e., occupational, social, intrapersonal). Fortunately, exposure and response prevention (ERP) has been clearly established as efficacious, effective, and efficient through a myriad of carefully controlled studies. Its palatability and acceptability remains less clear,

and it is not well understood what differentiates patients and significant others who accept this treatment approach from those who decline ERP. Up to 20% refuse ERP, leaving substantial numbers of patients un- or under-treated, often continuing unnecessary suffering. A case of chronic, severe and refractory OCD is examined and outcome data is presented along with qualitative information about patient and family perspectives on the treatment. In addition, supervisor views on using a new training model are introduced to describe critical contributions to palatability factors, in an effort to elucidate variables influencing optimal outcome/ Recommendations for future directions in process-driven outcome research are made.

THE MNEMONIC CONSEQUENCES OF MULTIPLE CHOICE AND TRUE FALSE TESTING: DO THE BENEFITS OUTWEIGH THE COSTS? Thanh-Truc T. Nguyen, Jeremy K. Miller, Department of Psychology, Willamette University, 900 State Street, Salem OR, 97301.

The present experiment explores the effects of multiple-choice (MC) and true/false (T/F) testing on the creation and retention of false memories. False memories can be defined as “memory for non-encountered events, facts, or aspects of a studied situation” (McDermott, 2006). Roediger and Marsh (2005) found that while multiple choice testing does result in improved retention of tested information, there are some costs associated with the testing method—namely, in that exposure to incorrect alternatives during the test can lead to the formation of false memories. The current study examined the long term persistence of the false memories created by MC and T/F testing. Participants read passages of study material and then were given a MC and T/F test regarding the information they had learned. They were subsequently randomly assigned to one of three retention intervals 1, 3, or 4 weeks after the pretest in which they returned and took a posttest. The implications of the data are discussed with respect to current theories of false memory. The practical implications of the findings with regard to the efficacy of MC and TF testing are also discussed.

PARENTAL ATTRIBUTIONAL STYLES AND ATTITUDES TOWARD PEOPLE WITH DISABILITIES. Martorell, Gabriela A., Seeborn, Troy, Myrick, Shannon E. Department of Psychology, Portland State University, Portland, OR

Previous research on individuals who work with children with intellectual disabilities or autism has suggested that individual characteristics may make a difference in the success of various interactions. Hastings and Brown (2002) found that there are characteristics of those individuals that are significant predictors of positive or negative reactions to problem behaviors, including such tendencies as one’s emotional reaction to difficult behaviors of children with intellectual disabilities or autism. Furthermore, Morgan

and Hastings (1998) specifically investigated attributions of difficult child behavior of special education professionals and found that the majority of participants made inaccurate attributions of the cause of difficult child behavior. To date, much of the research on attitudes toward people with disabilities has addressed educational and social services contexts. Nabors (2005) explored gender differences in attitudes and Graf & colleagues (2007) explored cultural influences on attitudes. To expand on the research investigating individual and group differences in attitudes, we investigated the role of parental attributional styles in relation to attitudes toward disabilities with 150 undergraduates at a large urban university. Participants were administered the Parental Attributions Test (Bugental, 2004), the Community Living Attitudes Scale (Henry, Keys, Balcazar, & Jopp, 1996), and a modified scale assessing attitudes toward inclusion and similarity of individuals with disabilities. Significant differences were found in attitudes toward individuals with disabilities based on parental attributional style. In addition to the findings, implications of attributional style as a predictor of attitudes toward individuals with disabilities will be discussed.

CORRELATES OF POLITICAL AFFILIATION, PARENTAL PARTY PREFERENCE, AND PHYSIOLOGICAL AROUSAL. Brandon Porter, Ross Bartlett, & Heide D. Island, Department of Psychology, Pacific University, Forest Grove, OR, 97116.

This study investigates the possible role that political orientation plays in arousal in reaction to traumatic events. Possible connections of political influences between parents and offspring were also investigated. The study included 53 participants from Pacific University (males=14, females=39) with a mean age of 19 years. The study involved participants filling out a demographics sheet and viewing a slideshow while being monitored on a Galvanic Skin Response II Machine. Through correlations, the parent/child political influence hypothesis was confirmed (0.381 and 0.467). Democrats and Independents differed in their Political Continuum Quiz scores and only Democrats and Republicans differed in measured GSR scores ($t(52) = 2.105, p = 0.042^*$). These findings suggest greater potential in Political Science and human behavior.

FAILURE ANALYSIS IN CHRONIC, SEVERE, AND REFRACTORY OBSESSIVE-COMPULSIVE DISORDER WITH A "PANDAS" ETIOLOGY: DIMENSIONALITY OF "FAILURE" AS DEMONSTRATED BY CONTRASTING OBJECTIVE OUTCOME AND SUBJECTIVE FUNCTIONING. Jason Richards, Jill Davidson, Johan Rosqvist, School of Professional Psychology, Pacific University, Portland, OR 97205.

Obsessive-compulsive disorder (OCD) is documented as a common anxiety disorder, with prevalence rates of approximately 3% in the general population. Left untreated this typically severe phenomenon

remains excruciating and insidiously deteriorates into true debility, often grossly affecting multiple areas of functioning (i.e., occupational, social, intrapersonal). Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal beta (PANDAS) represents an exceptionally recalcitrant etiological form of OCD, and patients who suffer with this particularly vexing subtype of OCD rarely achieve good outcome, much less recover. “Failure” in psychotherapy is, by convention, most often demonstrated by insufficient change in formal outcome measures, like the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) for OCD, according to simple yet sophisticated statistical evaluations (e.g., clinical significance). Cognitive-behavior therapy (CBT) interventions for OCD, like exposure and response prevention (ERP), has been shown to be exceptionally adept at ameliorating emotional difficulties of living in OCD cases. Yet, PANDAS OCD patients standardly fail to obtain expected outcome. The generation of new hypotheses and exploration of novel ideas hinge on carefully studying- and systematically evaluating reason for- failure. A chronic, severe, and refractory case of PANDAS OCD is examined in an effort to understand, explain, and offer potential answers and solutions to a less than desirable outcome. While the patient demonstrated inadequate response to efficacious interventions (e.g., inpatient, outpatient, medications, psychosurgery), subtype differences are highlighted and new benchmarks for “success” in failure cases are recommended. Suggestions for using failure analysis in complex cases are made to improve understanding of- and better interventions for- especially recalcitrant conditions.

ATTITUDINAL DIFFERENCES TOWARD BISEXUALITY: A PILOT SURVEY USING A STANDARDIZED INSTRUMENT. Bevyn K. Rowland, MA, School of Professional Psychology, Pacific University, Forest Grove, OR, 97116.

Bisexuality has been overlooked in the psychological literature as a matter of course in the paradigm shift from heteronormative mores, to the contemporary (and relatively) more inclusive approach common in the field today. In the study of human sexuality and relationships, the field of lesbian and gay (LG) affirmative psychology is still in nascent stages. Literature that focuses on LG-relevant and -specific issues has increased significantly in recent years. However, an artifact of the dichotomy-centered culture in which this evolving view is embedded, continues to skew the focus in a monosexually-oriented direction leaving a dearth of information about bisexual individuals. Given the paucity of data specifically addressing the experience of bisexual people, an investigative survey was conducted to ascertain attitudes toward bisexual people using the Attitudes Regarding Bisexuality Scale, Male/Female Version (ARBS-MF). Preliminary analysis of the data suggests that attitudes toward bisexual people vary as a function of gender and sexual

orientation of survey respondents. Further, attitudes toward bisexual people vary with regard to the gender of the bisexual person in question. The differences discovered in this survey may be indicative of attitudinal trends toward bisexual people and may provide insights for future avenues of research and implications for mental healthcare providers serving bisexual individuals.

DEMENTIA: PERSON-CENTERED APPROACH TO COMMUNICATION.
Catharine Sparks, Ronald E. McNair Post Baccalaureate Achievement Program
Summer Research Internship, Department of Psychology, Southern Oregon
University, Ashland, OR 97520.

This psychology literature review was conducted between June 2007 and August 2007 and focuses on communicating with individuals with dementia from a person-centered approach. Published research in the areas of dementia care, person-centered model of care, and communication when working with dementia clients were reviewed along with current instructional and educational publications. The review entails a look at dementia, communication abilities of the dementia client, an evaluation of the traditional medical model of care, and the benefits of a person-centered approach to communication. The review also includes suggestions for effective communication techniques when working with dementia clients. Although the majority of research in this area originates from the United Kingdom, there is a growing trend within the United States of developing a more individualized and personal approach to dementia care which will allow for valuing and understanding the unique experience of dementia from the perspective of the individual. There is evidence of a paradigm shift from a predominately biological-focused model of care to a more holistic approach which encompasses biological, psychological, and sociological needs.

GENDER TYPED WORDS AND GESTURES: AN ASSESSMENT OF THE
MACARTHUR COMMUNICATIVE DEVELOPMENT INVENTORY.
Chehalis M. Strapp, Rose M. Silbernagel, Psychology Division, Western
Oregon University, Monmouth, OR 97361.

Gender differences in early vocabulary growth for children under the age of 2 years are well documented (Huttenlocher et al., 1991; Fenson et al., 1994). Although maturational differences (Reznick & Goldfield, 1989) as well as differences in the amount and type of speech that parents address to boys and girls (Huttenlocher et al., 1991; Leaper et al., 1998), may contribute to such differences, how early vocabulary growth is assessed may also contribute to this disparity. Recently Stennes et al (2005) suggested that the MacArthur Communicative Development Inventory (CDI) a popular scale used to assess early vocabulary growth may contain more feminine type words relative to masculine type words. If such is the case, then the advantage observed for girls using this scale may be

partially explained by the ratio of feminine to masculine type words on the scale. The current study sought to examine gender typed words on the MacArthur CDI. Ninety-five undergraduates, 68 females and 27 males (age $M = 21.44$, $SD = 5.01$) rated words and gestures from the CDI as feminine, masculine, or neutral with regard to gender. Words and gestures that were consistently identified as feminine or masculine were further investigated. Results revealed that although a majority of the items were rated as neutral with regard to gender, of the remaining items, significantly more were associated with feminine concepts than masculine concepts, and such differences were consistent across male and female raters. Implications for current ways to assess early language development are discussed.

G.I.R.L.S POWER: NARCISSISM, SELF-ESTEEM IN A CONFIDENCE-BUILDING PROGRAM. Candace Murayama, Taryn Kamaura, Janelle Tamashiro, Pacific University, Forest Grove, OR 97116.

In the past decades alarms have been raised about girls' self-confidence (Orenstein, 1994) and the objectification of girls at younger ages (APA Task Force, 2007). As part of a three-month long after school program for 9-11 year old girls, researchers used the "Girls in Real Life Situations" program workbook and activities to assess pre and post program positive self-statements and social skills. To test the relative effects of narcissism on girls' behaviors, activity products, confidence self-ratings, and the 40 item Narcissistic Personality Inventory for Children (NPIC, Barry, et al., 2003) were used. The pre-test measured self-statements about body image, friendship, decision-making, emotional awareness, and self-confidence designed by the GIRLS program. We transformed these items into a 0-22 point ascending scale of "positive self-statements" and correlated these with the NPIC overall and subscales. Each week of the program girls also produced activities (e.g., self-portraits, questionnaires, art projects, etc.) that were analyzed for their content and changes. Overall, NPIC scores ranged from 2 to 26; Pre-Test: 8-20. The self-statement responses indicated that this sample was similar to larger studies (Smolak, 2004): only 14% were happy with their body image. Results indicated that the pre-test summed scores were positively correlated with NPIC score ($r=.67$; $p<.01$), specifically the higher scores on the "entitlement" scale ($r=.58$, $p<.03$). The program effects were most powerful in creating self-confidence for shy girls, but also promoting more accurate self-perceptions in narcissistic girls. Response to the program was so positive that it has been extended an additional six months.

HEALTHY HUMAN ATTACHMENT: HOW MUCH OF WHAT. Kathryn L. Thompson, Nicolle M. Clemmer, Erin E. Machan, Laci N. Allstot, Shannon M Lettow, Psychology Division, Western Oregon University, Monmouth, OR 97361.

Infants construct attachment models from expectations about self and others (Bowlby, 1988), which provide continuity in relationships (Collins & Read, 1990). Investigations of attachment have ranged from examining early biological regulation through contact (Hofer, 2006) to exploring emotional regulation through the adult's mentalization of an attachment figure with the other person's mind in mind (Allen, Stein, Fonagy, Fultz, & Target, 2005). Self-report scales measuring participants' memories and perceptions of self and others have been constructed to study attachment models. The purpose of this study was to evaluate these scales, their potential combinations, and relationships in their measures. University students (N = 364) responded to the Relationship Questionnaire (Bartholomew & Horowitz, 1991), the Adult Attachment Scale (Collins & Read, 1990), Descriptions of Parental Caregiving Style (Hazen & Shaver, 1986, as cited in Collins & Read, 1990), and the Inventory of Parent Attachment (Armsden & Greenberg, 1987). Cronbach's Alpha showed good reliability for these scales. Factor analyses revealed dimensions relevant to theory and research findings. Principal components analysis with varimax rotation on the combined Parental Caregiving Style Scale and the Inventory of Parent Attachment Scale indicated similar components for Mothers and Fathers. One component, Current Mentalization, addresses the knowing-being-known dimension of attachment. Another component, Childhood Memories, represents early contact. Principal components analysis with varimax rotation on the combined Relationship Questionnaire and the Adult Attachment Scale gave components consistent with Bartholomew and Horowitz's model of positive or negative views of self and others. We suggest future studies using these scales.

EXAMINING BARRIERS TO MENTAL HEALTH TREATMENT IN FILIPINO-AMERICANS FROM HAWAII AND EUROPEAN-AMERICAN COLLEGE STUDENTS. Jane M. Tram, Jennifer Hong, Michelle Truong, & James Maxson, School of Professional Psychology, Pacific University, Portland, OR, 97205.

Little research examining barriers to health care in the Hawaiian population exists and much of the existing work focuses on physical rather than mental health. One criticism of research with ethnic minorities is that diverse groups are often combined despite differences that exist (e.g., language, customs). In order to address this concern, we are focusing our study on one of the larger Hawaiian student groups on our campus – Filipino-Americans from Hawaii. In addition to identifying barriers to mental health treatment for Filipino-Americans from Hawaii, we are also interested in examining

the barriers to mental health that exist for European-American students to determine whether there are qualitative differences in the responses obtained from the two groups (e.g., are there differences in the barriers to treatment endorsed by the European-American and Filipino-American from Hawaii students in our study). Given that college students are typically more acculturated than children or adults, we anticipate that there will be more similarities than differences between our two groups. However, given the cultural components (both Pacific Islander and Asian-based) we anticipate that there may be more barriers to mental health treatment reported by the Filipino-American students from Hawaii in our study than the European-American students in our study.

INDIVIDUAL SELF-EFFICACY ABOUT GROUP PERFORMANCE AND GROUP DECISION MAKING. Michelle Truong¹, David Foster², Victor Savicki², School of Professional Psychology, Pacific University, Hillsboro, OR 97123, ²Department of Psychology, Western Oregon University, Monmouth, OR 97361.

There has been an increase in the use of work groups in organizational environments. Current research on self-efficacy in groups is largely derived from Bandura's (1997) theory. Typically, group efficacy is defined as the collective belief in the ability of the group to perform a specific task (Gibson, 2000). Little attention, however, has been given to the concept of individual self-efficacy about group performance and its impact on group outcome. Individual self-efficacy about group performance is defined as an individual's belief of how well he or she works within a group. This study will examine how individual self-efficacy about group performance, in combination with individual task competence, impacts the quality of group decision making under different conditions of group development. Data were collected from 92, three-person groups engaged in two intellectual, problem-solving scenarios. Individual and groups performance were assessed by comparing the decision against a known standard. The dependent variable was Group Added Value, the amount of variance in group performance after controlling for individual member competence. Individual self-efficacy about group performance was measured using a five item Likert scale. Univariate analysis of variance showed a significant interaction between Forming and most competent member's individual self-efficacy about group performance ($F= 4.383, p <.05$). Groups whose most competent member had lower individual self-efficacy about group performance and engaged in the forming task performed significantly better compared to the other groups. Several suggestions are offered to account for these results.

SCIENCE EDUCATION

Section Chairs:

Karen Bledsoe
Western Oregon University

SCIENCE EDUCATION – ORAL PAPERS

CREATION OF A REGIONAL NETWORK OF STEM LEADERS SUPPORTED BY PROJECT KALEIDOSCOPE (PKAL). Marlene Moore¹, Gary Reiness², Walter Shriner³, Jeanne Narum⁴, Departments of Biology, ¹University of Portland, Portland, OR, ²Lewis and Clark College, Portland OR, ³Mt. Hood Community College, Gresham, OR, ⁴Director Project Kaleidoscope, Washington, D.C.

PKAL's agenda for enhancing the undergraduate STEM learning environment depends on understanding and accelerating the process of change within the academy. Among well-documented reasons for the slow pace of change are lack of time, lack of knowing what works and/or absence of evidence about why and how programs work. There is now a growing body of experience that validates the power of networks for sharing ideas, for adapting, implementing, and assessing new pedagogical approaches. PKAL's goal is to distill *what works* from the experience of STEM leaders who have documented success in strengthening student learning, and to orchestrate activities that enable other campuses to adapt lessons learned by colleagues. Twenty years ago, pedagogical pioneers were few and far between. Now expertise is more wide-spread, but it is still isolated, even within campuses. Recognizing the value of networks, we have formed a Northwest regional network of faculty and administrators, known as PORTPKAL, committed to strengthening undergraduate STEM learning environments. Participants in this session will learn more about PORTPKAL and will help construct a data base of regional expertise. What expertise and experiences- in pedagogical or assessment approaches- would you like to: i) share with others; ii) bring to your campus?

PRESERVICE TEACHERS' RESEARCH: COGNITIVE PROCESSES INVESTIGATION OF MATHEMATICS AND SCIENCE CONCEPTS. Ronald Narode, Swapna Mukhopadhyay, and Jerry Young, Panel Moderators, Portland State University, Department of Curriculum & Instruction, Portland, Oregon, 97207-0751

Students in the Portland State University, Graduate Teacher Education Program conduct research into the cognitive processes of students in middle and high school mathematics and science as part of their teacher preparation. Topics range across much of the

curriculum advocated in national and state standards and include, weather and climate, the function of the cell, molecular theory, kinematics, Newtonian dynamics, algebra translation tasks, geometry, and linear and non-linear functions, to name a few. Carefully constructed interviews were recorded and analyzed to reveal preconceptions and alternative conceptions from students, many of whom have had instruction on the topics. Results have alerted prospective teachers to their students' prior knowledge, imaginative thinking, and language usage (with emphasis on student literacy). Interviews provide insight into what students believe and also help teachers look critically at how they pose questions. A series of brief presentations will describe the most salient aspects of the research as well as indicate the instructional relevance of the findings. Audience questions and suggestions are welcome.

SOCIOLOGY, ANTHROPOLOGY AND POLITICAL SCIENCE

Section Chairs:

Adele Kubein
Oregon State University

Richard Mitchell
Oregon State University

Dee Southard
Southern Oregon University

SOCIOLOGY- ORAL PAPERS

WHO CARES? THE CAREERS OF SOCIAL ACTIVISTS ON GENOCIDE IN DARFUR. Carolyn Zook, Department of Sociology, Portland State University, Portland, Oregon, 97207.

The term "genocide" first made its appearance after the Holocaust of World War II and the call to "never again" allow genocide to happen was touted globally. Sadly, however, genocide has continued to occur: Bangladesh in 1971, Cambodia from 1975-79, countries in the former Yugoslavia during the 1990's, Rwanda in 1994, Zimbabwe in 2000, and today, in 2008, it is happening in Darfur. The calls for "never again" have largely gone unheard. However, individuals across the United States and the world have begun to take a stand against genocide. Since the conflict began in early 2003, activists have created a number of organizations to speak out against the

genocide. Activist organizations established before the Darfur genocide began have since turned their attention toward the crisis, making it a primary focus. This study addresses the question: "How are personal activist careers on the genocide in Darfur created and what factors contribute to activists' continued involvement?" Through 14 semi-structured, face-to-face interviews, the career paths of individual social activists working on Darfur are explored. Preliminary findings suggest that these activists largely doubt the effectiveness of their actions and understand that their ability to create change is limited, however they are motivated by their religion or a personal sense of altruism to continue their work. Determining the factors that move individuals into action may aid in the successful recruiting, retaining, and motivation for others to join the effort.

TURNING THE OTHER CHEEK: THE ROLE OF CHRISTIANITY IN NATIONAL IDENTITY FORMATION AS SEEN THROUGH THE SOUTH AFRICAN TRUTH AND RECONCILIATION COMMITTEE.

Björn Bergström. Department of Social Anthropology, Stockholm University, SE-106 91 Stockholm, Sweden.

The study of conflict and crisis situations is rich with ethnographic data where routines and ideals of normalcy are thrown into a field of contention. This focus greatly enriches the discussion of culture theory and the processes of epistemic change. This article looks at how South African diversity and national identity were conceptualized within a period of social upheaval and change. Towards the end of apartheid rule, the South African Truth and Reconciliation Committee (TRC) was given the mandate to manage a peaceful political transition from apartheid to democracy, and offer a platform for social healing in the face of years of poverty, violence and marginalization. The TRC attempted to manage the social and cultural disparities by reframing the conceptualization of political and social justice as being restorative rather than retributive. Reconciliation became the primary method of conflict resolution and crisis prevention, founded in the local value systems of ubuntu and the Christian imperative for forgiveness. By combining these social norms with cultural centres of authority (religious organizations, the judiciary system, and public ceremony), the TRC attempted to reorient the national identity of South Africa as a transformed multicultural state. This ethnography has value in posing the cross-cultural applicability of culture specific and localized forms of conflict management strategies, and as a contrast and comparison for other current modalities of crisis prevention.

QUALITATIVE ANALYSIS OF FIRST GENERATION AND TRADITIONAL TRANSFER STUDENT ADJUSTMENT TO A FOUR YEAR UNIVERSITY. April Armstrong, Department of Sociology, Portland State University, Department of Sociology P.O. Box 751, Portland, OR 97207-0751.

This thesis explores the issues facing students who transfer from a community college to a four year university in order to complete an undergraduate degree. This research will examine similarities and differences between first generation and traditional transfer students' experiences in adjusting to the four year university. To capture the experiences of these students this thesis will employ qualitative methodology, specifically individual interviews. Because more students are making the choice to attend college, one consequence is that a more diverse group of students is entering post secondary education. No longer can researchers assume that college students are from a middle class demographic, attending a single college full time, age 18 to 22, and living on campus (Pascarella 2006). Many students from non-traditional backgrounds initially access higher education at the community college level, where smaller classes, less rigorous academic requirements, and cheaper tuition are the norm (Laanan 2001). When these students transfer to four year universities they face a range of issues due to differences between their community colleges and the four year schools in regards to size, difficulty of work and expectations.

ATTRIBUTES RELATING TO SUCCESS IN GRADUATE SCHOOL.

Dr. Dee Southard, Sociologist, McNair Program Director, Southern Oregon University, 1250 Siskiyou Blvd, Taylor Hall 125, Ashland, OR 97520.

This research was conducted during 2004-2007 at a small university in the Pacific Northwest. The research project included a literature review, a survey, and interviews to gather detailed information regarding attributes of successful graduate students, the graduate study preparation that undergraduate students might be receiving within their academic major departments, and advice for undergraduates preparing for graduate study in various fields from academic teaching professionals in those fields. The research utilized a self-selecting, voluntary participation sampling procedure. All of the departments at the university complete a survey and in-depth interviews were conducted with 30 faculty members from a wide variety of academic disciplines, each with a Ph.D. in her or his discipline. The survey data was analyzed quantitatively and qualitatively and the interviews were transcribed and analyzed using qualitative data analysis. The presentation describes the findings from the literature review, the survey and the analysis of the interview data. The application of the findings to the development of informational content for a seminar designed for undergraduate students who want to go on to earn a doctoral degree will be discussed and the "hints" and "tips" for success in post-baccalaureate environments that were provided through interviews with faculty members will be articulated.

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