Proceedings of the 1999 MARCUS Conference
Saturday October 9, 1999

Session I

11:00 – 11:15
Overstreet, Carson E: James Madison University

THE DIARIES OF LANDON CARTER 1752-1778: OPINIONS CONCERNING SLAVE MORALITY

The personal diaries of Landon Carter lend valuable insight into the mind and life of one of the members of the Virginia aristocracy. Through these diaries, though often implicit, one can begin to understand what an upper class Virginian deemed important in the eighteenth century. Carter does not write frequently about his slaves, but the times that he does, he is often angry with them. This paper examines his diaries to find instances in which Carter is angry and the way that he believed the slaves should be punished.

11:15-11:30
Schoettinger, Daniel G: James Madison University

INFLUENCE OF MAHAN'S THE INFLUENCE OF SEA POWER UPON HISTORY, 1660-1783

The rapid growth of the U.S. Navy during the mid-1890's coincided with a general change in foreign policy. While there were many economic, social, and political factors leading to these changes, some historians argue that nothing popularized them more than Alfred Thayer Mahan's *The Influence of Sea Power Upon History, 1660-1783*. Its sharp analysis described the contemporary position of the United States in terms that most Americans understood. More importantly, Mahan's work suggested goals for the future and described the means by which to achieve them. He argued that the U.S. must promote American economic interests abroad if it wanted to compete with Europe and Japan. This could be done through the acquisition of colonies and the creation of a modern navy to defend it. Mahan further suggests that the very nature of naval warfare had changed significantly and that U.S must adapt its naval strategy accordingly. Though historians debate the level of influence the book had on American society, its popularity makes *The Influence of Sea Power Upon History, 1660-1783* an important factor in the American shift towards imperialism.

11:30 – 11:45
Lozano, Matt: James Madison University

BILLY GRAHAM: ON MIDDLE GROUND

The focus of my research is the life of Billy Graham and his role during the Civil Rights Movement. My thesis is that Billy Graham's 1957 Crusade in New York City placed Graham in the center of the struggle between segregationist and integrationist Christians in America My research covers the entire life of Billy Graham and specifically the formation and application of his racial ideology throughout his life. In my paper I show how Graham was transformed from a believer in white superiority into a tentative integrationist. Furthermore, primary sources reveal how the 1957 Crusade was crucial in solidifying Graham's role as a mediator and peacemaker in the years to come. His statements during the Crusade not only gained himself fame as an evangelist, but placed him directly between segregationists and social activists for integration. The example of Billy Graham reveals much about America's process of change and confusion during the Civil Rights Movement.

11:45 – 12:00
Sessa, David J: James Madison University

THE SONS AND DAUGHTERS OF SLAVERY

Frederick Douglas once said that "slave-children are children, and prove no exception to the general rule." The often overlooked part of a slave's life are their formative years before they began work in the fields. What was life like for these young, growing slaves? This study will attempt to describe the early years of a slave's life. In fact, a major focus of the slave culture was the young, teaching them how to survive and be safe while in bondage. While cases do vary, common themes arise in the early formative day to day lives of young slave children's family and social atmosphere. Raising a child in the rigors of American slavery required a strong effort by the entire community, not just the parents, who, all too often, were sold away. In the state of enslavement, young children were prepared to face the rigors of slave life, even before they fully understood the true nature of their future life in bondage.

12:00 – 12:15
Ryan, Kara E: James Madison University

'WALK TOGETHER CHILDREN': THE MONTGOMERY BUS BOYCOTT, 1955-1956

Kara E. Ryan and Dr. Raymond Hyser
This paper takes a critical look at the Montgomery Bus Boycott of 1955-1956 and more specifically the court case that officially ended segregation of public transportation, *Browder v. Gayle*. Through the use of memoirs, newspapers and court records a clear distinction is made between the public and judicial aspects of the boycott. The way in which the social and legal issues impacted the movement and the results that came from each are discussed as well.

Session II

Baird, Lauren N: Davidson College

NATIVE RESONANCE: THE RESTIVE VOCABULARY OF LOUISE ERDRICH'S LOVE MEDICINE

Conversations in the ancient Native American idiom remain hidden or unfinished in Louise Erdrich's Love Medicine, and the essence of the novel inhabits these sequestered moments. This paper presents a reading of the work that explores its narrative infrastructure for native sounds. The inability of an American industrial and urban vernacular to communicate the nuances of tribal expression obliges another option; June Kashpaw and Lulu Lamartine in particular evince the strength of this alternate venue. Lulu's voice relies on modern words but employs the images and impulses of the elusive native language: names wield a manifest power, and she seeks narrative asylum in untranslated Chippewa asides. The quiet inflections of June's old and careful dialect subdue the cacophony of the tribe's contemporary predicament, and the images she invokes are metaphors for the entire novel. Water functions throughout as a symbol and sound of the culture's peculiar argot. By engaging the language of the past and its specific terminology, modern Indians recreate its referents. In the American literary tradition, Emerson's discourse on the language of the ""universal soul"" and Dickinson's attention to poetic diction prepare the reader to listen for this linguistic substructure. However, the precedent cannot adequately catalogue Erdrich's native resonance; the words immersed in tradition lap silently against the ethnic etymology of Love Medicine.

Pugh, Elissa, M: Sweet Briar College

ON THE ROAD AGAIN: THE FEMALE AMERICAN ROAD TRIP

During the 1960's in America, the male road trip was sifted in terms of focus and purpose by the female road trip. While men were searching for themselves and exploring with a (usually) national and American context, women were searching for identity with a/their family and within a community of other women. During the growth of the women's revolution in the 1960's, the coming of age of the female road trip is particularly relevant.

Stark, Caroline G: Sweet Briar College

AENEAS' DESCENT TO THE UNDERWORLD: BELIEFS OF THE AFTERLIFE

As part of my senior honors thesis, I will be exploring the concept of death and the afterlife during the late first century, B.C. with special emphasis on Book VI of Vergil's Aeneid. For the Marcus Conference, I would like to present work already done specifically on the influences in Book VI of the Aeneid. In the Aeneid, Vergil combines many different beliefs of the afterlife to create his own version of the underworld. Using elements from Homer's Odyssey and expanding his theory to include elements of Orphism, Pythagoreanism, and Platonism, Vergil cleverly intertwines ideas of metempsychosis along with issues of morality and justice to create a lasting impression of death and the underworld. His vision of the afterlife has influenced the minds of writers and theologians ever since, especially in Dante's Inferno where Vergil is his guide. Vergil's hero, Aeneas, conquers "death" and obtains wisdom of the afterlife and the cyclical nature of the universe. Vergil incorporates many of the mysteries of the various religious cults of his time along with virtue and a sense of justice in the life after death, giving validity and incentive to this new government he is supporting under Augustus.

Chalk, Brian P: James Madison University

THE SIGNIFICANCE OF WORDS IN HAMLET

My paper seeks to elucidate Shakespeare's use of words in Hamlet by examining the significance of a specific stage direction. The stage direction ""Enter Hamlet reading on a book"" (2.2.167) typifies Hamlet's tendency to ponder his predicament rather than act on it. The stage direction displays Hamlet's preoccupation with books and words, and illustrates his inability to set his plan of revenge into action.

Session III

2:00 – 2:15
Flood, Sarah M: Randolph-Macon College

A SUPPORT GROUP FOR TEENAGE MOTHERS AS AN ALTERNATIVE FAMILY FORM: A CASE STUDY.

My research seeks to examine the effectiveness of support groups for teenage mothers and mothers to be as "alternative familial arrangements." I am especially interested in not only how the immediate family copes or fails to cope with a birth to a teenager, but in how "substitute" or "surrogate" family members play a role. I conducted an ethnographic analysis of aprogram designed to provide educational, emotional, and social support for teenage mothers and mothers to be. In conjunction with my observations of support group meetings, I distributed surveys to program participants addressing their family situations and future plans. My analysis indicates that this support group operates as a functional alternative to the family, a finding that has relevance for the development and maintenance of alternative familial arrangements. My research indicates that familial diversity is an empirical reality that calls for the acknowledgement of such diversity and the possibility of system change to accommodate and enhance familial alternatives.

2:15 – 2:30
Galvin, Girard A: James Madison University

"AMERICAN INVOLVEMENT IN THE GOOD FRIDAY PEACE ACCORDS OF 1998"

The troubled past between the United Kingdom and Ireland has been a continuous source of strife, mistrust, and violence. My objective is to briefly explain this past and describe how the peace that has been elusive for hundreds of years is finally becoming a reality. More specifically, the focus of my presentation is how America and it leaders helped to foster peace. Attention is also paid to the motives of each of the main participants in the peace process; not surprisingly, the main objective for some was not always peace. I plan on giving enough background information to make the listener comfortable with the events leading up to the signing of the Good Friday Peace Accords in April of 1998.

2:30 – 2:45
Arner, Joseph N: James Madison University

THE RUINS OF REYKJAVIK

This presentation examines the October 1986 summit meeting at Reykjavik, Iceland between Ronald Reagan and Mikhail Gorbachev. It discusses the setting and issues, which prompted the necessity for a summit. The primary purpose is interpreting what actually occurred during the two days of negotiations and the astounding offers that were put forth and eventually rejected. Finally, the implications of the summit will demonstrate the role it took as a turning point in Soviet-American relations. The main sources used in researching are primary memoirs, U.S. government documents: reports and treaties, speeches and recorded interviews.

2:45 – 3:00
Iovino, James P: Virginia Tech

THE AMERICAN PERCEPTION AND RECONCILIATION OF THE FRANCO-AMERICAN ALLIANCE

A possible alliance, whether military or economic, posed several problems to the United States during the Revolution. In establishing an alliance with France, the Americans had to reconcile several differences between the two nations. Much of this reconciliation depended on how different factions in the United States perceived the alliance. There were three main responses in the United States to the Franco-American alliance. While ultimately each response arrived at much the same perception and reconciliation, each had its own unique framework in which to arrive at that conclusion. These three responses were that of the politians, the clergy, and the press in America. The perception of each of these groups was that American independence was the primary goal of the Revolution, and that this goal justified any and all alliances and diplomatic maneuvers. These groups successfully reconciled both the monarchy and Catholicism of France within the context of the ideals of the American Revolution. Consequently, British tyranny became associated with Catholic ""Popery,"" while the monarchical King of France became associated with the defense of liberty and natural rights.

3:00 – 3:15
Spero, Patrick: James Madison University

TYRANNY, OPPRESSION AND THE PAXTON BOYS' REBELLION A PROLOGUE TO THE AMERICAN REVOLUTION

The serenity of the Pennsylvanian winter exploded in 1763 when a band of frontier-settlers from the back-country towns of Pennsylvania raided an Indian camp in Lancaster County. This marked the beginning of the Paxton Boy's Rebellion. The examination of the ensuing "pamphlet war" reveals its underlying catalyst. The rebels' cause rested on their under-representation in the state Assembly. This sense of under-representation fostered a series of frontier grievances that manifested itself in this rebellion. The rhetoric of the pro-Paxton pamphlets repeatedly attempts to justify the rebels' actions by faulting the oppressive state government. The frontiersettlers' view of the state government as tyrannical produced a strong regional divide in Pennsylvania. The frontier was composed of an entirely different people, with an entirely different outlook on life, but they were governed by a disparate body unwilling to listen to the complaints of the frontiersmen. This revolt and consequent rhetoric draw a parallel to the American Revolution. The frontiersmen's cries for representation resemble the familiar phrase from the Revolution, "No taxation without representation." The frontiersmen, like the revolutionaries, felt separated and isolated from their government and this isolation was furthered by their inability to express themselves in the policy making body. The underlying the cause of the Paxton Boys' Rebellion and the American Revolution was the oppression the under-represented inhabitants felt by a tyrannical government. It was this tyranny that fostered their grievances, and forced their revolt. In this sense, the Paxton Boys' Rebellion and the rhetoric used to justify their actions serve as a prologue to the Revolution.

Session IV

2:00 – 2:15
Shusko, Christa M: Sweet Briar College

ON HAVING NO HEAD: MADNESS AND MULTIPLE OTHERNESS

Assisted by a Sweet Briar Honors Summer Research Fellowship, I researched Western modern and postmodern theories of the body, perceptions of madness, and ideas of "otherness." This presentation offers a synthesis of these three topics. I argue that the "mad" are often perceived as multiple Others. Perceptions of the insane as having no reason, or of having lost their reason, places the "mad" in the same or a similar category as other persons characterized as Others who are also thought to lack reason. Those persons lacking reason are, in Western society, traditionally those who are identified with the body, as an exploration of the works of Rene Descartes and Jean-Jacques Rousseau indicates. This perceived absence of reason is often attributed particularly women and those from ""Other"" cultures, i.e. non-European. And so, with categories of madness and insanity also viewed as non-rational, people from these ""Other"" groups can easily be perceived and presented by the dominant members of society as doubly irrational, or irrational for multiple reasons: thus a person may be identified by as an/Other Other.

2:15 – 2:30
Young, Robert A., III: Hampden-Sydney College

"THE PRACTICE OF ENGAGING REALIZATION: AN APPROACH TO SOCIAL ENGAGEMENT THROUGH THE PRACTICE OF THE SIX PARAMETERS OF MAHAYANA BUDDHISM"

*Robert A. Young and Lowell Frye**
I designed a research project to investigate the relationship between meditation and social engagement specifically focusing on Mahayana Buddhism and Zen practice. The method had two components: academic research and experiential research. I already had solid academic understanding from previous research on Engaged Buddhism. For my field research, I visited two organizations: the Greystone Foundation founded by Tetsugen Glassman Roshi - a mandala of for-profit and not-for-profit business offering jobs, housing, childcare and health services, and the San Francisco Zen Center where I was a guest student. In the presented research, I discuss meditation and social engagement through a two-fold process. First, the practice of realization is explained though the path of non-attachment outlined in the Six Paramitas. Second, the practice of engaging realization is discussed using two questions, which allow for an investigation into the problems I found arise when combining meditation and social engagement

2:30- 2:45
Jeremiah W. John: Hampden-Sydney College

"MAIMONIDES' ROOTS OF THE DIVINE LAW AND THE POLITICAL-PHILOSOPHICAL CRISIS IN MEDIEVAL JUDAISM"

*John W. Jeremiah and Lowell Frye**
Without a state of their own since the beginning of the Christian era, medieval Judaism faced politically dominant Christianity, but also a more theoretical challenge in Greek philosophy. Moses Maimonides, a 12th century Jewish rabbi and physician,

understood these challenges, and sought to redefine Judaism through a reconciliation of his religion with Aristotle. In his Guide of the Perplexed, he continues the Muslim tradition of formulating "roots," or fundamental principles of the Law, and yet goes beyond the merely defensive purpose that the Muslim theologians employ. The roots for Maimonides amount to an establishment of a truly "Jewish" view of political life, as well as the truths by which man becomes perfected. Such perfection, like Maimonides' true science of the Law, ultimately lies beyond politics.

2:45 – 3:00
Koss, Timothy A: Washington and Lee University

ARISOTLE AND KANT: DIVERGENT VIEWS OF MORALITY AND RESPONSIBILITY

I spent this past summer working in the Religion Department for Professor Davis, who is currently compiling a volume of essays on the theory of responsibility, including views from the Christian, Greek, and modern philosophical traditions. I read and screened certain books pertaining to the subject of responsibility, then wrote summaries of these books and discussed them with Professor Davis. These books included Moral Judgement, by James Q. Wilson, The Question of German Guilt, by Karl Jaspers, Doing and Deserving, by Joel Feinberg, and Moral Responsibility and the Boundaries of Community, by Marion Smiley. In the last part of my R.E. Lee research work, Professor Davis asked me to write a paper containing the views of responsibility found in Kant and Aristotle, drawing upon my other readings to help me analyze their positions. In my paper, I demonstrate that Aristotle grounds his theory of responsibility in the social and political realm, while Kant says that responsibility is absolute duty to the categorical imperative under the guidance of autonomy, or giving the absolute moral law to the self. While both views have good points, Aristotle's willingness to consult the community allows him to speak about moral dilemmas in ways that Kant cannot.

Session V

2:00 – 2:15
Kelly Kitchens: Hampton University

INFLUENCE OF pH FORMULATION ON 9-CHLORO-2-METHYLELLIPTICINIUM ACETATE ENCAPSULATION AND RELEASE VIA BIODEGRADABLE POLYMER

Kelly Kitchens, Eric Crumpler, Robert Langer*
Department of Chemical Engineering, Massachusetts Institute of Technology

The current solution to recurrent tumors is repeated radiation and chemotherapy, which have various effects on several tumor cells; however, they show no specificity toward any set of tumors(lung, breast, brain). The ellipticinium derivative salt, 9-chloro-2-methylellipticinium acetate (CME), is an enzyme inhibitor that is selective for CNS tumors. In this study, the pH of the internal phase (in the initial formation of microspheres) was adjusted to assess release and loading levels. Microspheres were fabricated of the polymer, 1, 3-bis (p-carboxyphenoxy) propane: sebacic acid(20:80) [(CPP:SA)], using the solvent evaporation method. The aqueous phase was adjusted prior to CME dissolution and emulsion formation. Basic solution degradation was used to assess loading percentages of CME [with pH 3.93 (2.75%), 6.49 (2.43%), 7.45 (2.45%) and 9.98 (2.41%)]. Release kinetics were evaluated over a seven-day period. UV-vis spectroscopic measurements of the samples were taken at regular time intervals and the cumulative release of CME from p(CPP:SA) was observed. After initial burst effects, average release rates of 1.311 μg/hr, 1.138 μg/hr, 1.021 μg/hr, and 0.8936 μg/hr were observed and delivery of 65.52%, 61.11%, 55.98% and 47.88% CME for microspheres formulated with pH 3.93, 6.49, 7.45 and 9.98 aqueous phase adjustments, respectively. Loading levels were slightly decreased, and slowed release was observed (as the pH increased).

2:15 – 2:30
Hamilton, Patricia, L: Sweet Briar College

THE EFFECT OF FISH PREDATION ON ZOOPLANKTON COMMUNITIES ACROSS A GRADIENT OF LAKE DEPTHS

Hamilton, Patricia L., Alan J. Tessier (Texas A&M University at Galveston)

Because they occupy a middle trophic level, herbivores are often simultaneously affected by both predators and resources. For example, in aquatic systems, suspension feeding zooplankton are known to be strongly limited by algal resource availability, yet also experience strong mortality from fish predators. However, across lakes of decreasing depth, there is a increase in the intensity of fish predation and a change to zooplankton species that are more resistant to fish predation. Along this gradient of increasing predation, a decrease in biomass of zooplankton and an increase in resource availability would be expected (trophic cascade theory). However, recent work showed this not to be true. We performed a set of field enclosure (predation release) experiments to estimate the strength of resource limitation for zooplankton across a gradient of lake depth. The experiments involved manipulating zooplankton biomass in each lake and measuring specific biomass change over 4 day intervals. In all

lakes, fish fed selectively on zooplankton prey, but the pattern of selectivity was most extreme in the deep lakes. Zooplankton response to biomass manipulation was well described by a linear model with no difference in slope among lake types. However, the elevation of these linear responses was different. Zooplankton assemblages in shallow lakes were further depressed below their resource limiting carrying capacity than were zooplankton in deeper lakes. These results suggest that the lack of change in biomass of zooplankton across a gradient of predation risk is associated with increased resource availability and higher productivity of zooplankton in shallow lakes.

2:30 – 2:45
Earl E Johnson: Radford University

DRINKING THE SALTY SEAS

Earl E Johnson & Sam Zeakes

Are we in danger of running out of the earth's most precious commodity, "fresh water" early in the new millennium? What can we do to make sure that there is enough fresh water to quench the thirst of a flourishing human population, and at the same time, prevent countries from going to war over water? This presentation will discuss technologies available for extracting fresh water from the seas.

2:45 – 3:00
Hawthorn, Anya: Radford University

A BEHAVIORAL AND ECOLOGICAL STUDY OF THE FUNNEL WEB SPIDERS "AGELENOPSIS NAERIA" AND "AGELENOPSIS PENNSYLVANICA " IN REGARDS TO WEB SITE SELECTION AND TERRITORIALITY.

Anya Hawthorn & Fred Singer

In an ecological study of funnel web sites on a 30 by 30 meter plot in Floyd county Virginia, spiders of the genus Agelenopsis were observed to spin webs on sites that were positively correlated with flowering plants, and negatively correlated with grasses and bare ground. A mathematical model was developed using discriminant analysis that predicted the prescence of a web at a given site correctly for 23 out of 28 web sites, and17 out of 28 nonweb sites. Behaviorally, A. pennsylvanica and A. naeria were found to be similar to the previously studied species in this genus, A. sperta, with a strong resident advantage in contests over territory, and no observable weight advantage. They appeared to be less territorially aggressive than A. sperta, possibly because good web sites are easier to find in a temperate environment than in a desert.

3:00 – 3:15
Murray Jessica: Wake Forest University

THE MEXICAN EXPERIENCE: AN EXPLORATION OF MEXICAN IMMIGRANT HEALTH IN NEW YORK CITY

Jessica Murray & Steven Folmar

This paper describes the unique set of challenges Mexican immigrants face in accessing health care. I studied Mexican immigrants in New York City, a recent immigrant population and distinct ethnic group characterized by strong ties to their culture and family. Any ethnic group displaced into a foreign culture will experience barriers in accessing health care. My research focused on identifying these barriers and posing responsible and plausible solutions to overcome them. This project was facilitated by Cross-Cultural Affairs of the New York City Department of Health, and Wake Forest University. Through a thorough literature review and in-depth interviews with community healthcare and advocacy providers, the following issues were addressed to determine these barriers: Mexican traditional health beliefs, cultural conditions that affect health, the medical encounter, and the current health problems of Mexicans in the United States. My research concluded that three major barriers preventing Mexican patients from receiving adequate care in New York City include intimidation and lack of trust of the system, different cultural conceptions of health form the provider, and communication difficulties. Solutions lie in a negotiation of cultural understanding between the provider and patient.

Session VI

2:00 – 2:15
North, Micah J: The Virginia Military Institute

VIABILITY STUDIES OF THE CATALYTIC PROPERTIES OF PT(DI-2-PYRIDYL KETONE)CL4

North M. J*.; Wilson M. H.; Garcia S. J.,Granger R. M¥.
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We report the synthesis, X-ray structure and catalytic properties of [Pt(di-2-pyridyl ketone)Cl4], henceforth [Pt(dpk)Cl4]. The compound [Pt(dpk)Cl4] undergoes rapid hydrolysis of the ketone carbon, yielding a transient gem-diol. One hydroxide of the gem-diol undergoes cyclometalation/condensation reaction yielding a Pt-O bond and a molecule of HCl. Unlike most ketones the compound Pt(dpk)Cl4] favors the hydrated form. Molecular modeling studies indicate a severe ring strain is placed on the ketone carbon ""forcing it to adopt an sp3-hybridization. This ring strain is confirmed by the X-ray structure of [Pt(dpk)Cl4]. This has prompted us to explore the possibility of adding other small molecules across the ketone bond. Reaction chemistry of [Pt(dpk)Cl4] with H2, CO2 and CO is discussed

2:15 – 2:30
Cox, Amanda C: Lynchburg College

A HAIR'S BREATH: THE FORENSIC ANALYSIS OF HAIR IN MEN, WOMEN, AND CHILDREN

Hair has become an integral part of forensic science. The establishment of a relationship between zinc content and age and gender has the potential to offer an inexpensive and efficient way of determining a preliminary profile of victims and suspects. In this study, the concentration of zinc in hair versus age and gender is investigated to determine if a relationship could be established. Samples of hair from men and women, age thirty-five to fourty-five, and children, age one to five, were collected. The concentration of zinc in each sample was quantified using flame-atomic absorption spectroscopy. In addition, the effects of a pregnancy and hair type on the concentration of Zn were also explored.

2:30 – 2:45
Radzio, Thomas A: Longwood College

USE OF QUARTZ CRYSTAL MICROBALANCE TO DETECT PESTICIDES IN WATER

Radzio, Thomas, A; Burgess*, James, D.

Preliminary experiments to develop a method of real-time pesticide detection using quartz crystal microbalance (QCM) are promising. Anti atrazine IgG antibodies were electrostatically immobilized to gold QCM electrode sensors. Cyclic voltammetry analysis showing decreased electrode capacitance following antibody immobilization, confirmed the formation of an antibody layer on the sensor. Atrazine (2ppm) in water was detected as a decrease in electrode oscillation frequency when bound by immobilized anti atrazine antibodies. Alachor, used as a control pesticide, was not bound by the immobilized anti atrazine antibodies, while atrazine was bound. To regenerate the sensor, NaCl solution (mM) was used to detach bound pesticide. This elicited sensor mass decrease of similar magnitude to mass increase following pesticide binding. Following NaCl treatment and H2O wash, immobilized anti atrazine antibodies bound atrazine, but not as well as at initial pesticide exposure. Future work will examine sensor reuse using covalently immobilized antibodies and voltage perturbations to detach bound pesticides."

2:45 – 3:00
Radzio, Thomas A: Longwood College

TRIGGERS FOR DMSP CLEAVAGE IN MICROALGAE

Radzio, Thomas, A.; Wolfe, Gordon, V.*
***1900 Shannon Point Road Anacortes, WA 98221**

Many microalgae cleave dimethylsulfoniopropionate (DMSP) to for dimethylsulfide (DMS), acrylate and a proton. Volatile microalgal DMS returns sulfur to the atmosphere and also serves an important climatological function as cloud-condensation nuclei. DMSP cleavage may also serve microalgae as part of an activated chemical defense against protist grazers. Gas chromatography was used to examine the effect of sparging, shaking, and polyamino additions as triggers for DMSP cleavage in Emiliania huxleyi. Sparging triggered low strain specific levels of DMS production in E. huxleyi 370, 373, 374, and 379. Shaking did not trigger DMS production in E. huxleyi, but did trigger production in larger Alexandrium spp. Polyamino additions elicited DMS production in E. huxleyi 373. Preliminary investigations into the lethality of these treatments did not indicate conclusively whether these triggers function as sublethal cues or simply lyse susceptible cells and bring together potentially compartmentalized DMSP and DMSP lyase.

Session VII

2:00 – 2:15
Panetta, Claire: Haverford

SEARCHING FOR KUMARI: AN EXPLORATORY STUDY OF VIRGIN GODDESSES IN THE KATHMANDU VALLEY

This study explored the lives of the Kumaris in the Kathmandu Valley. The Kumaris are believed to be Living Goddesses embodying the powerful Hindu deity Taleju, and as such are ritually worshipped by both Hindus and Buddhists alike. Individually selected from the ethnic group indigenous to the Valley, the Newars, these young girls reign between the ages of two and twelve, and are chosen on the basis of physical perfection and emotional stability and strength. Once selected they lead lives of intense ritual activity, worship and seclusion. They often live away from their family and are frequently prevented from receiving any formal education. Their reign lasts as long as they do not bleed, but with the arrival of menstruation, they are dismissed and return home; a place, which more often than not, they have forgotten. This research focused on the lives of both former and current Kumaris and attempted to understand their impression of and feelings towards the experience of being worshipped as a Living Goddess. Over the course of the four-week research period, former and current Kumaris in Kathmandu, Patan, and Bhaktapur were interviewed, in an attempt to understand the emotional lives of these girls and the ways in which they were shaped by their individual experiences. Despite the natural limitations of time and language, the research was quite successful, and several conclusions were drawn regarding the ramifications and implications of this practice. Though unanticipated, they shed new light on the practice of Virgin Goddess worship. It seems that the cult of Kumari is at a juncture; the combined impacts of tourist enthusiasm and anthropological interest are slowly beginning to redefine the tradition. Compounded by a burgeoning movement towards modernization, the practice of Virgin Goddess worship is in a fragile state. The conflict between the need for modernization and a desire for cultural preservation has left the tradition vulnerable and susceptible to change.

2:15 – 2:30
Taylor, Meredith, K: Sweet Briar College

FAUNAL ANALYSIS ON THE EURASIAN STEPPE

With the assistance of a grant from the National Science Foundation, I was given the opportunity to join the Kazakh-American Talgar project during June and July of 1999. Under the direction of Sweet Briar College Anthropology professor, Dr. Claudia Chang, I joined an archaeological team on the Eurasian Steppe, and studied environmental archaeology techniques. I specifically researched the faunal collection recovered from Tsiganka 8, the Iron Age site we excavated this summer. This research examined the animals thought to inhabit the Eurasian Steppe during the Iron Age from many perspectives. Petroglyphs carved into a rock outcropping were studied for the stories that they could tell of Iron Age hunting rituals, and for their pictures capturing the diverse species of animals that were used by ancient peoples. A modern Kazakh sheep slaughtering was witnessed in order to better understand the way that bones are ""packaged"" together after a slaughter, and to help identify butchering marks from those made by a hasty trowel during excavation. Data from a previous excavation was reviewed to gauge the percentages and species of animals that had once inhabited the area. From all of this, predictions were made regarding the numbers and types of animals that would be found at Tsiganka 8. I then followed the bones from recovery through analysis. At the end of July, the preliminary figures matched those initial predictions, and showed that the Iron Age settlers at Tsiganka 8 were consuming mainly domesticated animals.

2:30 – 2:45
Campbell, Jeremy M: Davidson College

PRELIMINARY EXPLORATIONS OF KUMAL, A LATE-CLASSIC MAYAN POLITY

Over the past twenty years, Mesoamerican archaeology - and indeed, the archaeology of state-level societies in general - has been concerned with the way in which smaller, peripheral sites of ancient occupation articulate with larger, established sites. Such investigations ask (and attempt to answer) pointed questions concerning the social organization of whole civilizations - the idea of "border zones" between polities, the way in which "peripheral" peoples allied themselves with proximal powers and the creation of a cross-polity system of structural cohesion. This paper recounts the first field season, the summer of 1999, of work at such a "peripheral" Mayan site, Kumal located 15 km SE of the larger Ek Balam and 40 km NW of the urban sprawl of Coba. The important tasks of dating and mapping the sire are discussed and how this information has already started to contribute to the answering of larger theoretical and practical questions in the study of the history of pre-Columbian Mayan civilization.

2:45 – 3:00
Cefaratti, Rebecca , J: Sweet Briar College

THE ARCHAEOLOGY AND ARCHAEOBOTANY OF TSIGANKA 8

Through a grant from the National Science Foundation, I had the amazing opportunity to travel to Kazakhstan to work on the Kazakh-American Talgar Project with Sweet Briar Professor Claudia Chang. Tsiganka 8 is an Iron Age site located outside of

Almaty on the southeast border of the Eurasian steppe near the Tien Shan Mountain range. For two months, I was immersed in the Kazakh culture, learning the language, religion, and culture of the descendents of Russian immigrants into the country, in addition to developing my skills as a field archaeologist. Part of the grant also stipulated that I work with two archaeobotanists, assisting them with the collection of charred seed remains and phytoliths. This experience was invaluable to my development as a student of archaeology/ archaeobotany and a member of a global community.

3:00 – 3:15
Romaniuk, Yulia V: Roanoke College

THE GOLDEN RATIO: ARCHITECTURE, ART, AND OUR PERCEPTIONS OF BEAUTY.

The Golden Ratio is a unique mathematical ratio that can be frequently encountered in nature. The Ancient Greeks considered the ratio to be the ideal proportion and used it when designing sculpture and architecture. Following the example of the Ancient Greeks, artists and architects throughout history used the Golden Ration in their compositions in an attempt to make their works perfect. Scientists have discovered that the Golden Ratio is the most pleasing proportion to the human eye. Moreover, the Golden Ratio is found in several areas of mathematics, such as logarithms and matrices. My goals for the Summer Scholar research are to study mathematical theories and applications that involve the Golden Ratio, to trace its use by painters, sculptors and architects, and to conclude with an experiment aimed at supporting the notion that the Golden Ratio creates proportions most pleasing to the human eye. I will explore how ancient and modern mathematical theories and artistic traditions are present in our everyday life. This project is unique and interesting because it brings several areas that may seem unconnected at first sight: mathematics, art, and our perception of beauty.

Poster Session

P-1
Emily V. Black: Sweet Briar College

EFFECT OF KAINATE RECEPTOR ANTAGONIST SYM 2081 ON CAPSAICIN-INDUCED HYPERALGESIA IN RATS

Emily V. Black; Simone, Don A. Ph.D.*
*** Dept. of Psychiatry, University of Minnesota,***
It is known that transmission of nociceptive information from the periphery to the spinal involves, in part, excitatory amino acid (EAA) neurotransmitters and their receptors. The function of the various EAA receptor types in pain transmission is not clear. The goal of this study was to investigate whether kainate receptors are involved in the development of hyperalgesia by determining whether the kainate receptor antagonist SYM 2081 attenuated capsaicin-induced hyperalgesia. In normal, untreated animals, interplantar injection of 10 ug capsaicin produces nocifensive behavior (elevation of the injected paw) suggestive of pain, an increased frequency of withdrawal from punctate stimuli applied to the paw (mechanical hyperalgesia) and the latency of withdrawal from noxious heat (heat hyperalgesia). Separate groups of animals were given IP (interperitoneal) injections of SYM 2081 at doses of 50, 100 or 200 mg/kg at 1hour prior to injection of capsaicin. The duration of nocifensive behavior was measured for five minutes subsequent to injection of capsaicin. Withdrawal responses to mechanical and heat stimuli applied to the plantar surface of both hindpaws were measured before injection of SYM 2081 and again at five and thirtyminutes after injection of capsaicin. Pretreatment with SYM 2081 produced a decrease in nocifensive behavior and in hyperalgesia to mehanical and heat stimuli produced by capsaicin, as compared with vehicle pretreatment. Doses of SYM 2081 had no effect on basal withdrawl responses to heat or mechanical stimuli. It is suggested that kainate receptors contribute to the development of hyperalgesia evoked by capsaicin.",

P-2
Sharma, Chhavi: Sweet Briar College

SYNTHESIS OF PHOSPHOROTHIOAMIDITE

Sharma, Chhavi , Granger, Jill. N (PhD), Davies, Robin. L (PhD)
Antisense DNA can be used to inhibit expression of a gene by targeting the m-RNA. This technique can therefore be used to switch off cancer activity. DNA composed of phosphodiester bonds can be used in Antisense therapy, but the anti-cancer effects are not long-lived. Substitution of sulfur for oxygen in the antisense DNA has been an area of considerable interest to researchers in order to increase the effect. Sulfur modified DNA oligonucleotide analogs are synthesized in the laboratory with a Gene Assembler using phophorothioamidites. Synthetic precursors, ethanedithiol monobenzoate and tris (pyrrolidino) phosphine were synthesized in the laboratory. NMR showed that the synthesis technique employed was a success. The project awaits testing of the sulfur modified oligonucleotide analogs on cancer cells.

P-3
Hylton, Matt: The Virginia Military Institute

SYNTHESIS OF DIPYRIDYLPHENAZINE COMPLEXES OF PT(IV)

Hyton M. and Granger R. M¥
¥Current Address: Dept of Chemistry, Sweet Briar College, Sweet Briar, VA 24595
The synthetic scheme used for the synthesis, of tris(1,10-phenanthroline)platinum(IV) hexafluorophosphate [Pt(phen)3][PF6]4 (1) has been adapted for the synthesis of other Pt(IV) complexes containing extended ring diimene ligands. We report the synthesis of [Pt(dppz)3][BPh4]4 {dppz = dipyridylphenazine}. Infrared, UV-vis, NMR and cyclic voltammetric data are presented and discussed.

P-4
Ellis, Shannon, L: Mary Washington College

A TRACE METAL ANALYSIS OF HAZEL RUN

Hazel Run is a tributary of the Rappahannock River in Fredericksburg, Virginia. In 1987, a study was undertaken to analyze the health of Hazel Run by studying concentrations of Chromium, Copper, Lead, Manganese, and Zinc. A new study duplicated the experimental procedure of the 1987 study to determine if development of the Fredericksburg area had damaged the natural environment of Hazel Run. Water and sediments samples were collected at eight locations along Hazel Run. Concentrations of dissolved metal ions in water samples were detected with Atomic Absorption. Sediment samples were partitioned into adsorbed, reducible, and oxidizable fractions and tested in the same manner. For water samples, only chromium and copper had higher concentrations than the previous study. Zinc had similar concentrations. For the adsorbed and oxidizable fractions of the sediment samples, only chromium had higher concentrations. Chromium, manganese and zinc had higher concentrations for the reducible fraction. While this study has shown increased concentrations for some of the metals, further studies are needed to determine if results are reproducible.

P-5
Co, Jason E: The Virginia Military Institute

CONFORMATIONAL ANALYSIS OF THE 4,6-DISUBSTITUTED QUINOLIZIDINES: PREPARATION OF THE 6Z, 10Z DIASTEREOMER.

Jason E. Co, Victor E. Zottig, Tappey H. Jones
A 4,6-disubstituted quinolizidine was detected as a major component in a collection of myrmicine ants belonging to the genus *Solenopsis (Diplorhoptrum).* While there are four possible diastereomers, the natural compound has been proven to be (6Z, 10E)-4-methyl-6-propylquinolizidine. Synthesis of all four diastereomers has provided material for nuclear magnetic resonance studies. In particular, a stereospecific preparation of the (6Z, 10Z) diastereomer will be presented.

P-6
Lederhouse, Russell, T: Mary Washington College

THE DEPLETION OF SEROTONIN AND ITS BEHAVIORAL EFFECTS "","ON COORDINATION, LOCOMOTION, AND RIGHTING TIME IN ELAPHE O. QUADRIVITTATA.

Russell T. Lederhouse and Dr. John Temple,*
****Jepson Science Building 329 Mary Washington College Fredericksburg, VA 22402***
In previous studies it has been determined that a depletion of serotonin, 5 - HT, has been correlated with movement disorders. In this study we used Yellow Rat snakes, Elaphe obsoleta quadrivittata, to investigate a serotonin synthesis inhibitor para-chlorophenylalanine, PCPA. This experiment was conducted to determine the effect of decreasing levels of serotonin and its correlation to coordination, locomotion, and righting time. A pegboard apparatus was used to test for initiation and duration of coordination and locomotion, while a balance rod served as an additional test for coordination and movement. Preliminary studies showed a dose of 500 mg/kg/day x 2 i.p. most successful having the greatest affect on brain chemistry after 4 days. However, the movement disorders were most pronounced between 6 - 12 hours after second injection. A treatment of PCPA 400 mg/kg/day x 2 i.p. significantly reduced 5 - HT (38.5%) and its metabolite 5 - HIAA (82.9%). PCPA treatment also suggestively decreased levels of dopamine, DA, (20.0%). PCPA injection (400 mg/kg/day x 2 i.p.) significantly increased the righting time and significantly decreased the time spent active on a peg board apparatus. It was also observed that all PCPA treated snakes appeared dazed until stimulated by touch then resumed normal functions, this being most observable on the balance rod and righting test. This experiment showed that PCPA significantly affected the coordination, locomotion, and righting time of the

Yellow Rat snake, however, it is uncertain to say whether the observed responses to PCPA were do to 5 - HT or DA depletion or a synergistic effect.

P-7
Wood, Justin G: The Virginia Military Institute

MOLYBDENUM REDOX EQUILIBRIUM IN GLASSMELTS

Justin G. Wood; Henry D. Schreiber
Molybdenum has a tremendous effect on glass products. Glass is often made by internal electrical heating in which molybdenum compounds are used as electrodes for heating. Molydenum is often used in specialty glasses as opacifiers. Still yet, it is used as the key ingredient in many secret industrial trade recipes. In order to more fully understand the role of molybdenum in glass, it is essential to understand the redox conditions controlling the glass characteristics. The problem with varying molybdenum redox states in glass is that they show no distinguishing colors. As a result, a method had to be found to determine the redox state present in various glass compositions. Potassium bromate titrations helped to determine the relative reducing power of the molybdenum while magnetic susceptibility tests were performed to help determine the presence of molybdenum metal. The results helped to identify the molybdenum redox equilibrium and to assign reduction potential values with respect to other multivalent elements.

P-8
Dwarzski, Noelle E: Sweet Briar College

ZINC IONS IN UNUSUAL DNA STRUCTURES
Dwarzski, Noelle; Sutter, Sarah; Klevickis, Cynthia; Granger, Jill; Sabat, Michal* //*Department of Chemistry, University of Virginia, Charlottesviile, VA 22901
Recent advances in molecular biology brought to light several new forms of DNA, including hairpins, cruciforms, triplexes, and quadruplexes. Metal ions play a very important role in the formation and stability of these unusual DNA structures. Nuclear magnetic resonance (NMR), X-ray crystallography, as well as computational chemistry were applied to elucidate the role of zinc ions in AGCT cruciforms and GA hairpins. The results of the studies as well as the biological significance of our findings will be discussed.

P-9
Zottig, Victor E: The Virginia Military Institute

CAST SPECIFIC VENOM ALKALOIDS FROM A PUERTO RICAN THIEF ANT* SOLENOPSIS (DIPLORHOPTRUM) *SPECIES.

Victor E. Zottig, Jason E. Co, Tappey H. Jones*
Investigation of venom alkaloids found in an undescribed Puerto Rican Theif ant [*Solenopsis (Diplorhoptrum)* sp.] revealed the presence of two diastereomic indolizidines [**1**] and two piperidines [**2**]. The structures of **1** and **2** were established by comparison of the authentic samples to the synthetic samples. The implications of the relationship of the alkaloid structures and sterochemistry between the castes of this species will be presented.

P-10
Spore, Dixie F: Mary Washington College

DETECTION OF PROTEOGLYCANS

Dixie F. Spore and Dr. Adele Addington (The Virginia Military Institute, Department of Chemistry).
The purpose of this research project was to develop a method to detect proteoglycans released from cell surfaces. Two assay systems were used to determine the presence of proteoglycans: gel electrophoresis followed by either protein or glycoprotein staining, or Western blot analysis. The primary antibody used in the Western blotting procedures was a monoclonal antibody directed against chondroitin sulfate containing four sulfate moieties per subunit. After treatment of porcine heart valves with the general proteinase trypsin, no intact proteoglycans were detected, although their presence was confirmed before treatment. Thus a suitable assay system for the detection of intact proteoglycan loss has been established.

P-11
Miller, Peter M: The Virginia Military Institute

CHARACTERIZATION OF "MSX

Peter M. Miller and Dr. Adele Addington

In the synthesis of platinum (IV) tris-phen, a by-product was formed that was found to have rapid cytotoxic effects on L1210 cells in culture, killing all of the cells present within 24 hours. This mysterious compound, called "mystery substance X" , or MSX, has been investigated to determine its identity. Infrared Spectroscopy was performed and confirmed that the substance was similar to platinum (IV) tris-phen. Elemental analysis was also performed, and using the program Soft-Shell, a molecular mass and structure was assigned for the compound. According to the proposed structure, the compound contains a platinum 2+ ion, not the 4+ ion present in the platinum (IV) tris-phen. The presence Pt^{2+} is consistent with the rapid cell death demonstrated by other Pt^{2+} compounds such as cisplatin, although earlier data obtained from cyclic voltometry showed the compound to contain a Pt^{4+} ion. The structure of the molecule will be confirmed with X-ray crystallography. Additional toxicity studies are outlined that will determine the time-line and LD 50 for the material. Cell fractionation studies will also be performed to determine if there is a specific site of accumulation of the material within the cells, thus suggesting a possible mechanism by which the compound exerts its cytotoxic effects.

P-12

Hallett, Richard D.; Boyer, C. Tom, Parker, Darrius P: The Virginia Military Institute

CONTINUING STUDIES INTO THE DESIGN AND USE OF A CAPACITOR PLATE FOR THE REMOVAL OF ADHERENT CELLS FROM CULTURE PETRI DISHES

Hallett, Richard D.; Boyer, C. Tom; Parker, Darrius P; Adele Addington, J. Shawn Addington, Edward D. Wheeler

The purpose of this study is to investigate the design and use of a novel culture petri dish structure, which utilizes electrical fields for the removal of adherent cells from the surface of the dish. The realization of this device involves 1) a study of thin film deposition, including material selection, processing techniques, and electrical characterization; 2) toxicity studies to evaluate effects of films on cells; 3) electrical testing, including electrical field strength and electrical contact analyses; and 4) cell repulsion testing and comparison with existing techniques. Work thus far on this project has focused on the realization of electrical thin films. Different chemical compositions (indium tin oxide and tin oxide) and methods of deposition (spray pyrrolysis, and dip coating followed by firing) have been tested. Results indicate that none of the thin films realized so far are sufficient to meet the needs of the device. Preliminary electrical field and electrical contact analyses have been performed. These, along with the toxicity and cell repulsion studies, are awaiting the development of a usable thin film. The study will pursue the use of pre-deposited thin film materials in order to complete the electrical and chemical characterizations. Once selection of a thin film has been finalized, a prototype of the device will be realized and tested.

P-13

Pressman, Elana, R: Mary Washington College

THE FEVER RESPONSE IN THE GARTER SNAKE THAMNOPHIS RADIX RADIX:, A BACTERIA DOSE DEPENDENT RESPONSE

Pressman, Elana, R; Temple, John, G.

"A fever is an increase in body temperature resulting from an elevation in the thermoregulatory set point. As ectotherms, snakes have a voluntary fever response, they induce a fever by moving to a warmer location. Research has shown that the fever response of snakes can be used to study the fever response of mammals. This experiment questions if the fever response in Thamnophis radix radix is a dose dependent response. Snakes were allowed to thermoregulate in an aquarium with a thermal gradient on the bottom, and their cloacal temperatures following the injection of the alcohol killed bacteria Aeromonas hyrdophila and were compared to their cloacal temperatures following the injection of saline. Preliminary data show a dose and time dependent response of cloacal temperature following the injection. Injection of 6.5x107 cells/g body weight dose caused a 2.350C drop in the first 24 hours followed by death, and 6.5x106 cells/g body weight caused a .20C increase in the first 24 hours and a 1.70C decrease in the second 24 hours. The dose of 6.5x105 cells/g body weight caused a 1.70 decrease in the first 24 hours and an increase of approximately 10C in the second 24 hours. This is an ongoing project. Based on research showing a snake can maintain different temperatures in different body parts, the dose eliciting a fever response will be used to give a snake a localized infection, and whether the snake will it induce a fever only in the infected part of its body will be tested.

P-14

Hewitt, Cindi R: Ferrum College

ATTENUATING PESTICIDE RESIDUES

Pylypiw, Harry M. PhD Krol, Walter J. PhD Arsenault, Terri Incorvia-Mattina, Mary Jane PhD,"Harry M. Pylypiw*
Connecticut Agricultural Experiment Station; 123 Huntington St.; New Haven, CT

The impact of rinsing, cooking, and refrigeration, on produce pesticide residues was explored over approximately a ten week period. Fifty gram samples of four specific commodities - peas, spinach, lettuce, and strawberries - were subjected to various methods of preparation and then analyzed on two different gas chromatography detectors for organochlorine and organophosphate pesticides. While rinsing appeared to have a significant effect on some pesticides, the effects of neither cooking nor refrigeration can be determined. Both of the latter methods require further investigation to be able to come to a solid conclusion as to the effects on pesticide residues. Many questions about pesticide residue reduction still remain unanswered at this time. Questions of non-dietary exposure to pesticides are also being explored. This summer, glove experiments were performed to determine if there was dermal exposure to pesticides during spraying, harvesting, and handling of the produce. While the results from these initial experiments are not conclusive, they open the door for further research in this area.

P-15
Yim, Hing W: U. of NC at Charlotte

GROUP 6 METAL COMPLEXES WITH A NEW THIOETHER LIGAND

Yim, Hing W.; Tran, Linh M.; Dobbin, Ebern, D.; Rabinovich, Daniel
The first member of a new family of tripodal thioether ligands, the methyltris[(alkylthio)methyl]silanes MeSi(CH2SR)3 (R = Me), has been synthesized and characterized. Reactivity studies lead to the isolation of the complete series of group 6 metal carbonyl derivatives {h3-MeSi(CH2SMe)3}M(CO)3 (M = Cr, Mo, W), whose structures have been determined by single-crystal X-ray diffraction. The three complexes are isomorphous and display distorted octahedral structures with face-capping tridentate thioether ligands.

P-16
Blackwell, William C: U. of NC at Charlotte

SYNTHESIS AND STRUCTURE OF A CHROMIUM THIOETHER COMPLEX

Blackwell, Wiliam C.; Bunich, Dmitry; Rabinovich, Daniel
The first transition metal derivative of the tridentate thioether ligand MeSi(CH2SPh)3, the chromium(0) complex {MeSi(CH2SPh)3}Cr(CO)3, has been prepared and fully characterized, including a single-crystal X-ray diffraction study. The octahedral complex exhibits one of the longest Cr(0)-S(thioether) bond distances ever observed. Preliminary reactivity studies will also be presented.

P-17
Richburg, Lauakia M: Johnson C. Smith: UNC Charlotte

ZINC BIS(PYRAZOLYL)SILANE COMPLEXES

Richburg, Lauakia, M.; Farouq, Karmal J.; Rabinovich, Daniel*
****Dept. of Chemistry - UNC Charlotte***
The two bis(pyrazolyl)silanes Me2Si(3,5-R2pz)2 (R = H, Me) have been readily prepared from dichlorodimethylsilane and the corresponding lithium pyrazolate salts. These new bidentate nitrogen donor ligands have been used to prepare the labile zinc derivatives LZnX2 (X = Cl, Br, I), whose characterization will be described

P-18
Bobb, Susan C: Sweet Briar College

INTERPERSONAL INVOLVEMENT IN SUCCESS OF TASK COMPLETION

Occupational therapy trends advocate increased therapist-client interaction to enhance client recovery. Based on this tendency, the following two experiments hypothesized that increasing interaction between experimenter and participant should increase improvement on an assigned task. In Study 1, the task consisted of tossing pennies. 37 participants were chosen from a women's liberal arts college, and were randomly distributed into one of three levels of interaction: limited interaction in which participants performed the task alone; physical interaction in which the experimenter was present during the sessions with limited verbal interaction; and emotional interaction in which the experimenter was present and established an emotional rapport with the participants. There were no significant main effects. Significance was found for perceived difficulty of task, in which the physical interaction group found the task most difficult. An overall positive attitude towards the task was also found significant. Mean trends support the original hypothesis. Study 2 incorporated the design of Study 1. However, performance was measured using a block assembly task. 26 participants were chosen from the same women's liberal arts college, and were randomly distributed into the same three levels of interaction which had been slightly modified. Results showed no significant main effects. Significance

was found for perceived influence of practice and of experimenter on performance. Overall feelings of participants decreased from session 1 to session 2. Mean trends support the original hypothesis..

P-19
Pruitt Jennifer C: Lynchburg College

CAFFEINE SELECTIVELY DISRUPTS CONTEXTUAL FEAR CONDITIONING IN RATS.

Pruitt , Jennifer C. and Corodimas , Keith P.
The present study was undertaken to determine whether caffeine influences emotional learning to spatial (conditioning context) and nonspatial stimuli (tone). A classical fear conditioning paradigm was used to examine the effect of caffeine on the acquisition of context conditioning, a hippocampal-dependent associative task, and tone conditioning, a hippocampal-independent task. In the first experiment, acute administration of caffeine 15-minutes before the presentation often tone-shock pairings severely disrupted the acquisition of context conditioning, but had no effect on tone conditioning, when conditioned fear was measured in rats 24 h later. This effect was dose-dependent: a dose of 10.0 mg/kg had no effect on either context or tone conditioning, whereas doses of 20.0 and 30.0 mg/kg selectively disrupted context conditioning. Experiment 2 indicated that caffeine's preferential effect on context conditioning could not be attributed to state-dependent learning. Experiment 3 examined the effects of chronic caffeine administration on emotional learning. Continuous exposure to caffeine (3 doses) for 7-days had no effect on the acquisition of context or tone conditioning. Together, these findings indicate that acute administration of caffeine severely disrupts, in a dose-dependent fashion, fear learning to contextual spatial cues, while sparing fear learning to discrete nonspatial cues (tone).

P-20
Bellan, Melissa J: Sweet Briar College

INADMISSIBLE EVIDENCE: DOES THE SEVERITY OF THE CRIME EFFECT HOW EVIDENCE IS HANDLED?

The present research attempts to discover the effects that inadmissible evidence and crime severity have on case outcomes. The method for studying these effects involved two studies, one a pilot study and the second a slight modification to the scenarios used in the pilot study. For both studies, a 2x3 (severity x evidence type) factorial design was utilized. It was hypothesized that the manipulation of severity (victim or no victim) and evidence type (admissible, inadmissible, or no additional evidence) would have effects on juror decisions. An overall result in the pilot study was the unexpected lack of guilty verdicts across all conditions. In study two more incriminating evidence was added to the scenarios in an effort to increase the number of guilty verdicts. This modification did increase the number of guilty verdicts, but the change was not significant. Statistical analysis did not reveal significant findings, but further analysis of both studies did reveal important trends. Results demonstrate a trend toward more guilty verdicts in the severe (with victim) conditions, as predicted. Means for each evidence category showed a trend toward more confident results in the admissible and inadmissible evidence conditions than the no additional evidence conditions, as predicted. The percentage of guilty verdicts also revealed a trend toward more guilty verdicts when any additional evidence was introduced, than when no additional evidence was presented.

P-21
Collinson, Ellen, M: James Madison University

THE ROLE OF SPIRITUALITY/RELIGION AND SOCIAL SUPPORT IN COPING WITH SERIOUS ILLNESSES

A recent Gallup Poll (1999) found that 95% of Americans say that they believe in God, 58% say that religion is very important in their lives, and 71% say they are members of a church or synagogue. The number of Americans claiming to have a belief in God or placing a high importance on religion according to the Gallup Poll suggests that spirituality/religion may play a significant role in coping with serious life threatening illnesses. In addition to spiritual/religious beliefs, social support has been identified as a primary resource for individuals coping with life threatening illnesses. The purpose of this research was to create a proposal for a protocol at the National Institutes of Health, Warren Grant Magnusum, Clinical Center. The studies presented in this proposal indicate that spirituality/religious beliefs and social support do play a role in coping with serious illnesses. It is in facing life threatening illnesses that people reassess how it is that they have defined themselves and their worth in this world and they are forced to come to a new understanding of their being and purpose. These studies attest that patients using spiritual/religious methods of coping and those patients with high levels of social support cope better with major stress events than those who lack the comfort of a strong faith or social support. The proposed protocol will determine the importance of spirituality/religion and social support in coping with serious illnesses

P-22
Friedline, Nathan K: The Virginia Military Institute

N-4-FLUOROBENZYL ANALOGS OF N-DIARYLMETHYL PIPERAZINES AS POTENTIAL DELTA OPIOD RECEPTOR LIGANDS AND IMAGING AGENTS.

Nathan K. Friedline, M. Scott Furness, Kenner C. Rice, Richard B. Rothman*, and Tappie Jones*
Laboratory of Medicinal Chemistry, National Institute of Diabetes, Digestive, and Kidney Diseases, National Institute of Health, Bethesda, MD 20892; *ClinicalPsycho-pharmacolocy Sect. IRP, NIDA, NIH, Baltimore, MD 21224; * // *Department of Chemistry, Virginia Military Institute, Lexington, VA, 24450.

A 4,6-disubstituted quinolizidine was detected as a major component in a collection of myrmicine ants belonging to the genus Solenopsis (Diplorhoptrum). While there are four possible diastereomers, the natural compound has been proven to be (6Z, 10E)-4-methyl-6-propylquinolizidine. Synthesis of all four diastereomers has provided material for nuclear magnetic resonance studies. In particular, a stereospecific preparation of the (6Z, 10Z) diastereomer will be presented.

P-23
Easterly, Evangeline M: Sweet Briar College

INTERNAL DOSIMETRY OF MICE IN SMALL ANIMAL X-RAY CT MICROSCOPY

Evangeline Easterly, Mike Paulus, Kimberly McMahan, Abu Ahmed
The MicroCAT is a small animal CT used to scan mice in order to search for possible phenotypic mutations and cancers; all effects from radiation, chemical mutagens, or genetic reengineering. Studies performed on mice are valuable information because their genome is similar to humans. The purpose of this experiment was to determine the radiation dose to the skin and internal organs of the mouse during a high-resolution scan using the MicroCAT. Thermalluminescent detectors were used to measure the radiation dose. Significant differences were found in the dose to internal organs. The skin and outer organs received a higher dose than internal organs, depending on the attenuation of the X-rays as they passed through tissues.

P-24
Ponte, Carolyn: Sweet Briar College

A STUDY OF SWEET BRAIR COLLEGE LAND: THE","RELATIONSHIP BETWEEN MICROBIAL ECOLOGY AND THE USE OF THE LAND

Ponte, Caroyn,E.D. Davies, Dr. Robin, L.
The purpose of this research was to examine the effects of Sweet Briar College land use on the health of the land through studying the microbial ecology of the soil. For this study picked five representative sampling areas including cultivated land, the old dairy lot, grazing land, the lawn, and the Boone-Prior nature sanctuary. Soil samples were collected, diluted, and plated on both Sabouraud dextrose agar with streptomycin and nutrient agar in order to select for both fungal and bacterial growth. Each plate was examined for the numbers and diversity of organisms based on their macroscopic colonial morphologies. Each type of microorganism was isolated and plated again for further analysis. A total of 50 different types of fungi and 38 types of bacteria were isolated. The area with the greatest number of bacteria present was the nature sanctuary, while the lawn sample had the least. The cultivated land samples had the most fungi, while the grazing land had the least. For the levels of species diversity the cultivated land samples showed the highest levels of both bacterial and fungal diversity while the lawn samples showed the lowest levels. Based on the results we conclude that the microbial ecology of the soil is affected by its use. Possible causes of the effects we observed include the use of fertilizers, pesticides, herbicides, type of vegetation, amount of organic material, and biological burden.

P-25
Morgan, Kelly E: Mary Washingon College

EXPRESSION AND INHIBITION OF LEISHMANIA TOPOISOMERASE II

Kelly E. Morgan and Dr. Kelli M. Slunt
Leishmaniasis is a serious disease caused by the parasite Leishmania. Due to the problems with current treatments, there is a need for a better therapy.1Mitonafide analogs may selectively target the topoisomerase II of Leishmania chagasi.2 To discover the most selective drug treatment, mitonafide analogs were synthesized, purified and verified using H1 NMR.3 Two pure compounds effectively killed leishmania with LD90 of 50mM and <6.25mM. Further studies require expression and purification of the leishmanial topo II from bacteria. TOP2 gene was isolated from leishmanial genome using PCR and analyzed by gel electrophoresis. Purified plasmid DNA and the TOP2 gene were digested using restriction enzymes and ligated together. Transfection of competent BL21Lys cells with this vector has been unsuccessful, although transfections with a control have been completed. Future research includes expression and isolation
of the enzyme followed by more extensive drug studies.

P-26
Nichole Arthur and James Burgess: Longwood College

KINETICS OF MONONUCLEAR AND DINUCLEAR PLATINUM COMPLEXES BINDING TO DNA MODIFIED QUARTZ CRYSTAL MICROBALANCE ELECTRODES

Arthur, Nichole, D.; Burgess, James Ph.D.
These experiments measure the kinetics of covalent attachment between the arnticancer agents cis-$[Pt(NH_3)_2(H_2O)_2]^{+2}$ and $[\{trans\text{-}{+}Al(NH_3)_2\}_2\{u\text{-}H_2N(CH_2)_6NH_2\}]^{+2}$ and single stranded DNA. Kinetic measurements are made using quartz crystal microbalance (QCM) electrodes modified with thiol functionalized DNA (Tarlov and co-workers, J. Am. Chem. Soc., 120 (1998) 9787). The reaction of cis-$[Pt(NH_3)_2(H_2O)_2]^{+2}$ and $[\{trans\text{-}{+}Al(NH_3)_2\}_2\{u\text{-}H_2N(CH_2)_6NH_2\}]^{+2}$ with the surface confined DNA has been characterized by tracking QCM frequency shifts upon exposure of the sensor to each of the platinum complexes under wall-jet flow conditions. Both covalent binding and electrostatic association between the platinum complexes and DNA are observed.

P-27
Mary Margaret Shaffer: Randolph Macon Woman's College

EXPRESSION AND CHARACTERIZATION OF PLASMINOGEN ACTIVATOR INHIBITOR-2 IN MCF7 CELLS

Mary Margaret Shaffer, Diane Palmieri & Frank Church
Metastasis is a major cause of morbidity and mortality in breast cancer patients. Tumor cell invasion into distant areas of the body is dependent on the cell's ability to degrade the extracellular matrix, travel through the blood or lymph system, and extravasate to a secondary site to form metastases. The Plasminogen activator (PA) system is known to play a role in the tumor's ability to metastasize. I studied the effects of the expression of the serpin, Plasminogen activator inhibitor-2 (PAI-2) in the MCF7 breast cancer cell line. PAI-2 is an inhibitor of the PA system and has been implicated as a positive prognostic indicator in breast cancer. A vector containing the wild type PAI-2 cDNA and a "non-inhibitory" mutant form of cDNA were transfected into MCF7 breast cancer cells, which do not normally produce PAI-2. I examined the expression of mRNA produced by the enriched cell populations through rtPCR and found that when compared to untransfected negative control cells, which are known to produce PAI-2, the message was being expressed in the wild type and mutant transfected cells. Immunohistochemical analysis was used to demonstrate the presence of PAI-2 protein in these cells. Mutant cells were observed to grow more slowly than the wild type and untransfected MCF7 cells. Adhesion assays detected no change in any of the cell's abilities to adhere to serum or vitonectin. In a cytotoxicity assay, I found that the presence of wild type PAI-2 slightly inhibited the ability of TNF-alpha to induce cell death. Cell survival was slightly lower in the mutants suggesting that PAI-2's ability to inhibit apoptosis is dependent upon its ability to inhibit a protease. The level of PAI-2 production may be a critical factor in conjunction with other proteases and inhibitors employed in the future to develop an accurate prognosis for breast cancer patients.

P-28
Kathryn S Benson, Cameron Kerr, David Volz, Douglas Williams: Univ. of South Carolina, Marine Science

AN UNDERGRADUATE PHYSICAL AND CHEMICAL OCEANOGRAPHIC STUDY OF WINYAH BAY, SOUTH CAROLINA

The Marine and Aquatic Research Experience (MARE) program for undergraduates was established to assist students in making critical connections from the classroom to the research world. MARE provides science and engineering majors with the opportunity to design, develop and implement independent research projects in marine science. The MARE team conducted four expeditions on Winyah Bay, South Carolina, over a six-month period from 1998 to 1999. Winyah Bay is a major estuarine system that is part of the third largest watershed on the East Coast. Using CTD and GPS systems to establish a physical framework, samples of water and sediment were taken at approximately 35 stations in order to study the relationship between physical mixing and the chemical behavior of nutrients in the estuarine system. Student members of MARE will report on the data from Winyah Bay and make comparisons with results from the published scientific literature.

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Sabat, Agnes E: Sweet Briar College

TISSUE CULTURE-BASED TESTING OF PLATINUM AND PALLADIUM COMPOUNDS AS ANTI-CANCER AGENTS

Agnes E. Sabat, Robin Davies and Robert Granger

Platinum (II) compounds such as cis-diamminedichloroplatinum (II) (Cisplatin) and cis-diammine (1,1-cyclobutanedicarboxylato) platinum (II) (Carboplatin) are used in the treatment of several aggressive cancers, including ovarian, lung, testicular, and bladder carcinomas. However, some of these compounds can also have toxic effects on the kidneys, gastrointestinal tract, and nervous system. In order to avoid the toxicity as well as several other problems associated with administration of the drugs, new platinum and palladium compounds have been investigated. We have tested a series of platinum (IV) and palladium (IV) complexes against the normal lung cell line WI-38 as well as the cancerous cell lines SW480 and A-427. Our results show that some of the compounds exhibit remarkable activity against the cell lines derived from lung cancer.

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Buck, Kristin M: Mary Washington College

PROTEIN ISOPRENYLATION IN LEISHMANIA CHAGASI

Buck, Kristin M. Slunt, Dr. Kelli M.

Leishmaniasis is a potentially fatal disease caused by Leishmania parasites.1 Current treatment involves injection of pentavalent antimonial compounds.2 These treatments are toxic, expensive, and moderately effective, making development of alternative drugs highly desirable. One potential treatment would involve inhibition of protein isoprenylation, a necessary post-translational modification for many eukaryotic systems. This project involved basic research on isoprenylation in Leishmania chagasi. Leishmania were incubated 24 hours in 30?M mevastatin, an inhibitor of HMG-CoA reductase. HMG-CoA reductase catalyzes the formation of mevalonic acid, precursor to all known isoprenoids.3 Tritium-labeled mevalonic acid was added, and the incubation repeated. Proteins were isolated by TCA precipitation and non-protein bound lipids were removed by organic extractions. Liquid scintillation counting proved that a mevalonic acid derivative was incorporated into leishmanial proteins.4-5 Molecular weights of modified proteins were approximated using SDS-PAGE. Incorporated isoprenoid compounds were characterized by GC/MS.6 Future research will involve cytotoxicity studies with known isoprenylation inhibitors.

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Webber, Keith A: Mary Washington College

A STUDY OF CYTOCHROME C USING MEMBRANE MODIFIED ELECTRODES

Scott, Raymond & Keith A. Webber

Although several experiments had previously been performed to study the electrochemical properties of cytochrome c, all of these experiments involved an environment very dissimilar to cytochrome c's native environment: within a cell's mitochrondria. In this experiment, a membrane-modified gold electrode was built to imitate the mitochondrial membrane in which cytochrome c naturally functions. This was done by growing a lipid bilayer containing cytochrome oxidase onto the electrode surface. Cytochrome oxidase is a hydrophobic enzyme which selectively oxidizes and reduces cytochrome c as the potential of the gold electrode varies. Cyclic voltametry was used on the electrode to study both the progress of the membrane fabrication on the electrode and the electrochemical properties of cytochrome c itself. Having accomplished that, this experiment also served as an example to show that other hydrophobic enzymes can be grown into lipid membranes onto an electrode.

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INCREASED FREQUENCY OF GLUTATHION-S TRANSFERASE (GSTT1)NULL GENOTYPE IN PATIENTS WITH APLASTIC ANEMIA AND MYELODYSPLASTIC SYNDROME.

Background: Aplastic Anemia (AA) and myelodysplastic syndrome (MDS) are both heterologous haemopoeitic disorders with toxic environmental factors contributing to the etiology of both. A link between an individual's ability to metabolize potential carcinogens and disease state of these patients, at these loci, may render patients susceptible to the development of AA and MDS and may therefore act as a potential biomarker for these disorders. Objective: To determine, as part of an ongoing study, the prevalence of both GSTT1 and GSTM1 null alleles in patients with AA and MDS. Methods: DNA was extracted from patients' bone marrow samples. Multiplex PCR was used to specifically amplify both GSTT1 and GSTM1 alleles together. The actin allele was used as the positive control, to verify PCR conditions. PCR was repeated in all cases showing null alleles. Results: Thirty-one and 53% of AA and MDS patients, respectively, showed a null GSTT1 genotype, and 58% and 60%, respectively, showed and null GSTM1 genotype. Control values for the GSTT1 is 16% and for the GSTM1 is 50%. Conclusions: These

preliminary results show a strong correlation between the GSTT1 null genotype with both AA and MDS, suggesting decreased detoxification of environmental or endogenous carcinogens may be a contributing factor.