

Bitterly, Julia, REVITALIZING FRENCH RURAL CULTURE, Dr. Linda Pett-Conklin, International Studies

The massive rural-to-urban migration that characterized much of 20th Century French history is now subject to a reverse trend; today more city dwellers are making a permanent move to the French countryside. The repopulation of rural France will have a significant impact on local and national French culture, as well as the regional European and global community. This paper will explore the urban-to-rural migration as an elemental trend that will directly affect social demographics, economic conditions, and the cultural identity of France as specifically related to the indigenous populace and new immigrants to rural communities. The most considerable effects upon local and national French populations are three fold. First, the social dynamic and necessary adjustment to change between incomers and natives is crucial to the survival of the local and national demographic. Second, the potential for economic success in rural areas, which is conventionally confined to an urban locale, has expanded due to substantial technological innovation in mass communication and transportation. Third, growth in rural population will reinforce France's traditional cultural identity, which increases its importance as individual member states of the European Union seek to balance separate nationalistic identities within the broader context of the European community. Conclusively, the repopulation and revitalization of rural France will prove to be a timely, influential trend intrinsically related to French history, as well as the economic and social future of France.

Coursey, Josh, A. Holliday, A. Rossi, GENETIC VARIATION IN MYSIDS: A COMPARISON OF ITS 1 rDNA AND MITOCHONDRIAL DNA BETWEEN POPULATIONS OF AMERICAMYSIS BAHIA IN THE TEXAS GULF COAST , Dr. Donald Frohlich & Dr. Ruth Bagnall, Biology

Americamysis bahia is a species of marine mysid shrimp found in estuaries throughout the gulf coast, the Bahamas, and the Atlantic coast of South America. Most of the year, populations of mysids exist in isolation in their respective habitats. However, during the winter months, individuals leave their estuarial habitats for the deeper waters of the Atlantic. It is during this time that we hypothesize these normally isolated populations of mysid individuals will have the opportunity to interbreed and thus exchange genetic material with each other. In order to determine the genetic relationships that exist between populations of mysids, we are investigating (via PCR and gene sequencing) the similarities and differences that exist in the ITS 1 rDNA regions between populations of *A. bahia* indigenous to several estuaries throughout the Texas gulf coast. ITS 1 rDNA is a spacer DNA found in the multi-copy nuclear gene for ribosomal DNA and thus recombines. We are also investigating similarities and differences in the cytochrome oxidase 1 region of mitochondrial DNA, a non-recombining gene. From this information we will extrapolate, or infer, phylogenetic relationships between the studied populations.

Espineli, Eddie, and Hatfield, Landon, CHARACTERIZATION OF *BEMISIA TABACI* BIOTYPE PROTEASE ACTIVITY USING GEL

ELECTROPHORESIS INHIBITION ASSAY, Dr. Rosemarie Rosell & Dr. Donald Frohlich, Biology

Bemisia tabaci whiteflies are harmful to a variety of crop species for many reasons, chief among those being that they are vectors of plant diseases. Whiteflies ingest Begomovirus during feeding on infected plants, and transmit the virus when they subsequently feed on uninfected plants. Begomoviruses are single stranded DNA viruses that have only a protein coat with no associated lipids. Our focus is on the role(s) that the whitefly digestive system play(s) in virus transmission. In whole body whitefly extracts, we have identified enzymatic activity with a pH 5.5 optimum that specifically targets protein breakdown. We have demonstrated significant activity of proteases at the protein level through electrophoresis using SDS polyacrylamide gels containing gelatin as a substrate for the enzymatic activity using Cathepsin B, an acidic cysteine protease commonly found in Hemipterans, as a positive control. Inhibition of proteolytic activity using specific classes of protease inhibitors showed that a mixture of proteases was present in whole body extracts and that the predominant activity corresponded to lysosomal proteases in the cysteine protease family. However, other proteases representative of enzymes that do not have an acidic pH optimum appeared to be present in the whole body extracts. Thus, future work will focus on identifying these types and classes of proteases and to specifically identify which of these classes are present in the digestive system.

Fayle, Taylor , THE EPISTEMOLOGY OF HENRI BERGSON, Dr. Ted Rebard, Philosophy

“This book affirms the reality of spirit and the reality of matter, and tries to determine the relation of the one to the other by the study of a definite example, that of memory.” So begins Henri Bergson’s classic work on epistemology, *Matter and Memory*. As the giant of French intellectual life at the turn of the twentieth century, Bergson held that the classic debate between realism and idealism could no longer be isolated to the armchair of philosophy. Pulling from biology, psychology, physics, mathematics, metaphysics, and epistemology, *Matter and Memory* is a synthesis of scientific disciplines that had been growing more and more disparate. Fusing these approaches, Bergson asserts that past metaphysical dualisms have been built upon the utilitarian function of our senses, which, by nature necessarily distorts reality due to the intellectual “spatialization” of things. Aware of the problem, Bergson attempted to lay hold of “true experience,” to which he offered as his answer the time-image, and through which he believed he was able to place physical and psychical realities within a single continuum. The richness of his idea saw a fierce attack by both German and French phenomenology. However, since Bergson’s time there does seem to be a striking continuity between *Matter and Memory* and new research being done in the philosophy of mind, particularly in the field of cognitive neuroscience. This presentation will briefly summarize Bergson’s epistemology, offer the most challenging arguments against it from phenomenology, and then attempt to reconcile Bergson with certain contemporary theories in philosophy of mind.

Fayle, Taylor , ICONOCLASM IN THE 8TH CENTURY: LEO III, JOHN OF DAMASCUS, AND CONSTANTINE V, Sr. Madeleine Grace, C.V.I., Theology

The iconoclastic controversies that took place in Constantinople between the years 726 and 843 A.D. may perhaps be called the defining moment in the history of the Orthodox Church. The reason for its significance, however, is not merely of an historical nature. The debate that took place over the use of images in the Greek Church represents the culmination of theology as articulated by the Church Fathers. Looking at both the historical and doctrinal elements that formed the early period of iconoclasm, this paper will follow the three main figures involved in the struggle from 717-787 – Emperor Leo III, St. John of Damascus, and Emperor Constantine V. Their motivations and especially their justifications will be given special attention to show the very theological depths reached through the debate, which struck at the very heart of the Greek Church. In following these three characters, the operational divide between Church and State will also be considered. For as the iconoclastic controversy developed, it made a lasting imprint on the form dialectics would be given between the Eastern Church and political authorities. Both institutions would be given a clearly defined realm of authority in the East, whereas in the West, these distinctions never materialized.

Gallagher, Sean, THE WAR IN IRAQ: PROBLEMS OF JUST WAR THEORY, Dr. Terry Hall, Philosophy

After September 11, 2001, the United States responded with its War on Terror. One of its chief targets was Iraq, which the government said harbored terrorism, and particularly Al-Qaeda, the terrorist organization that claims responsibility for the attacks. The War in Iraq and the War on Terror have brought to light interesting problems for Just War theorists. In my research I have analyzed both traditional Just War founders such as St. Thomas and St. Augustine, as well as current theorists such as James Turner Johnson, Michael Walzer, Michael Novak, George Weigal, and Fr. Richard John Neuhaus. In doing so I have sought to apply their work to: (1) the principle of legitimate authority as it relates to the international community, particularly the United Nations; (2) certain issues of jus post bellum (justice after the war), most notably treatment of prisoners and nation building; (3) terrorism and the distinction between combatants and noncombatants; and (4) the proposal of a principle of continual review, which is to say an obligation, based on just war theory under which the reasons of Just Cause are maintained jus bellum (justice during the war).

Herrera, III, Emiliano MEDIATING BODY: THE GROWING MESTIZAJE AND HEALTHCARE ADVOCACY, Sr. Paula Jean Miller, F.S.E., Catholic Studies

The dramatic increase of persons of Mexican decent in the southwestern U.S. has strained the American healthcare system and is a threat to the health of the mestizaje. How can these disparities of health care be resolved? How can a better interaction between the American healthcare system and the mestizaje be established? I propose that a Catholic mestizo advocate healthcare model will sufficiently address the aforementioned social ills

and will transform, transcend and confront the inequalities of care facing the mestizaje. Specific characteristics have emerged from the unique historical, socio-economic conditions of the population: a rejected and marginalized identity; a search for belonging; a poor public image; a deeply religious nature and preservation of religious traditions; a conservation of language; a movement toward a better life; an openness to outsiders; and a sense of solidarity and family. According to Virgilio Elizondo, these characteristics are closely related to the historical example of Jesus on earth. By juxtaposing the characteristics of the mestizaje with the Christ model of priest, prophet and king, a Catholic mestizo advocate model emerges. This model addresses the special needs of this underrepresented group that must be met by persons who participate in the mission of Jesus as priest, prophet and king. Just as Jesus restores humanity's fallen condition, so too can the advocate help restore the health of the mestizaje.

Hollomon , Stephanie , HOMOSEXUAL MARRIAGE: IS IT IN THE STATES BEST INTERESTS AND WHO SHOULD DECIDE? Dr. Jon Taylor , Political Science

Homosexuality has been in existence for almost as long as the institution of marriage; and now some advocates are attempting to merge the two concepts into one legal, accepted union which alongside traditional marriage, will attempt to perpetuate, preserve, and protect the interests of the civil state. The issue has escalated into a nationwide debate, and no entity remains impervious to its implications. In fact, the subject considered comprehensively may become one of this decade's most important domestic policy issues in the United States. This paper will assess the various legal, moral, and political arguments on the issue of homosexual marriage. It is hypothesized that the Supreme Court's interpretation of federalism will eventually lead to a mixture of state-sponsored civil unions, quasimarrriages and the outlawing of homosexual marriage among the states. This dissension could then possibly lend itself to a political rather than legal solution—The Federal Marriage Amendment. The research has been methodically arranged into three sections that will sequentially build upon each other. In the first section, marriage is defined according to our contemporary culture and political society. Secondly, the differing policies among the states and the impact these unique policies have on the interpretation of the Constitution. Finally in the third section the recently proposed but failed Federal Marriage Amendment is illuminated and elucidated to reveal the potential effects it bears upon the reserved powers of the state.

Karako, Susan, ALBERTO GINASTERA: AN INCREDIBLE MUSICIAN AND THE INFLUENCE THAT LITERATURE AND LITERARY MOVEMENTS HAD ON HIS MUSIC, Dr. Debra Andrist, Spanish

Music has often been called the language of the soul. For Alberto Ginastera, an ingenious composer from twentieth century Argentina, music stood for more than just the emotions of the soul. Influenced by literature, especially Gauchesca literature, Ginastera's music undertook the difficult task of expressing the history of the Argentinean people, their

daily lives, their culture, and the political struggles as expressed in Argentinean literature. Thus inspired, Ginastera created music both historically nostalgic and original, familiar yet strange, and personal yet universal. I am going to discuss the background of Ginastera's life, the society he was born into, and the music he composed. I am also going to discuss the literary currents of the day, especially the Gauchismo movement and its historical origins. Finally, I will show the influences of Argentinean literature on Ginastera's music and the inseparability of the two.

Le, Thuy, Rajan, Jessen, INDUCTION AND ACTIVITY OF SUPEROXIDE DISMUTASE (SOD) IN *AIPTASIA PALLIDA*, Dr. Joanne Romagni, Biology

There are a variety of enzymes that act as defense chemicals under stress conditions. One of these is superoxide dismutase (SOD). The role of SOD is to scavenge free radicals, including singlet oxygen and superoxide radicals, to prevent eventual peroxidation of membranes and cell death. In this study, we have documented the induction and activity of SOD isozymes in the symbiotic anemone, *Aiptasia pallida*, under chronic and acute stress. Our objective was to determine the advantages of the symbiotic relationship under common environmental stresses. We have documented the responses of symbiotic anemones, aposymbiotic anemones and isolated algae (*Symbiodinium* sp) to both chronic and acute salinity and temperature stresses. We have determined that there is one constitutive isozyme in the anemone *A. pallida*. For the two induced isozymes we observed, it would appear that a minimum of 48 hours is needed for biosynthesis. Pseudo-2-D gels revealed a detailed look at the isozymes. Using Western blotting, we were also able to determine where the isozymes were produced. In quantifying SOD activity, we found that aposymbiotic anemones have a significant increase over controls and symbiotic anemones. Isolated algae exhibited no change under stress conditions. Since sea anemones are a model system for coral, which have the same symbiotic relationship with algae, better understanding of stress response mechanisms of anemones may give us greater comprehension of the causes of coral bleaching in order to devise suitable solutions.

Martinez, Amber, THE PSYCHOLOGY OF SHAME AND GUILT AND THE SACRAMENT OF CONFESSION, Sr. Paula Jean Miller, F.S.E., Catholic Studies

Vatican Council II calls the Church to work with the social sciences to develop pastoral care that enables the faithful to live a more authentic and fulfilling faith life. Current research in the field of psychology has examined the phenomenon of guilt and shame, elements integral to sacramental confession. Although psychological counseling has, in many cases, replaced the confessional, its advancements and new insights can be used to enhance the confession experience. If psychologists and pastors dialogue, this relationship will help them to better counsel the whole person, spiritually and psychologically. Father John Corapi, S.T.D., says that of all professionals, psychologists are the ones in the position to work most closely with the priest in pastoral care. This media presentation provides a multi-disciplinary definition of shame and guilt, and

proposes ways that psychologists and priests can work together to respect both the integrity of the Sacrament of Confession and the dynamic multi-faceted dimensions of the human person.

Massey, Daniel, MULTI-WAVELET BASIS FOR QUANTUM MECHANICAL CALCULATIONS, Dr. Michael Colvin, Mathematics

Wavelets are a class of functions that have no analytical form and that can be tailored to have several unique properties. These special properties of wavelets can provide information compression advantages in numerical quantum mechanical calculations. Single-wavelet families have successfully been used to better calculate quantum mechanical problems and other complicated partial differential equation, but there is a limit on the number and type of properties single-wavelets can have. A new variety of wavelets, multi-wavelets, can in principal have an inexhaustible number of properties tailored to it. Using a multi-wavelet basis with particular properties one can overcome the immense difficulties that arise when trying to solve the Schrodinger equation for many quantum mechanical problems. We have developed a multi-wavelet system composed of orthonormal, multiplicity 2, symmetric/anti-symmetric pair, multi-scaling, wavelets with compact support ranging from length 2 to 5, exact polynomial reproduction up to cubic order, and accompanying orthonormal scaling and wavelet edge functions. No current multi-wavelet system simultaneously possesses all these properties, which should prove exceedingly useful for solving quantum mechanical problems.

Mott, Julianna, THE TRIALS AND TRIUMPHS OF THE JURY SYSTEM: FROM MEDIEVAL ORIGINS TO MODERN DAY CHALLENGES, Dr. Jon Taylor, Political Science

The legal system as it has been established in the United States is the culmination of centuries of testing and improvement both on the North American continent and in England. The judicial procedure known as trial by jury is not nearly as ancient as the practice of law itself, but this procedure has remained an enduring part of the legal process since its first widespread use under the reign of King Henry II of England. Since the early use of this system, the jury as a legal institution has had to prove its worth by competing against other types of legal remedies for dominance as the preferred mode of trial. In recent years a storm of high profile criminal cases have brought the issues of jury reform and jury preservation to the forefront of legal debate. The challenges posed to proper jury and juror conduct by the increasingly invasive media, juror biases, inequality in the skill set of the presenting lawyers, and even manipulation of the jury are being addressed by the Supreme Court, legal scholars, and courtroom justices. In gaining an understanding of the history and struggle for acceptance that accompanied the rise of the jury trial as a pillar of the judiciary system, the importance of safeguarding this institution will become apparent; and in examining the current challenges to the system, a greater appreciation for the solemnity of the institution will be enriched.

Pawlik, Jennifer, Le, Thuy, INDUCTION AND ACTIVITY OF SUPEROXIDE DISMUTASE (SOD) IN *AMERICAMYSIS BAHIA* EXPOSED TO SALINITY STRESS, Dr. Joanne Romagni & Dr. Ruth Bagnall, Biology

Americamysis bahia is a small crustacean that is a significant component of estuarine food webs. Mysid shrimp are important indicators of environmental quality in marine habitats, and *A. bahia* is specified by the Environmental Protection Agency for use in bioassays of substances to be discharged into marine and estuarine waters. In many environmentally stressed organisms, induction of isozymes of superoxide dismutase (SOD) occurs. SOD protects cells against oxidative stress. In this study, spectrophotometric assays, native gels and pseudo-2-D gels were used to determine the forms of SOD isozymes present and quantify their activity in mysids subjected to salinity stress. In documenting the induction of SOD in *A. bahia* under acute and chronic salinity stress, we found that there are several constitutive SOD isozymes whose concentrations appear to decrease after 48 hours. In determining SOD activity, we observed that a minimum of 48 hours is required for a measurable cellular response. We hope better understanding of the levels of common estuarine stressors that induce a higher production of SOD will help in modeling environmental quality indicators for marine habitats.

Sena, Juanita, TRADITIONAL SPANISH LANGUAGE MAINTENANCE AND THE REVITALIZATION OF CULTURE AND FAITH: A MISSION FOR THE BODY OF CHRIST, Sr. Paula Jean Miller, F.S.E., Catholic Studies

The revitalization and maintenance of the dying traditional Spanish language in New Mexico is essential to the Hispanic culture and to the diversity of the world. More importantly, this renewal and reordering of culture through language and customs is essential to the Body of Christ, since humanity's highest goal is communion with God through union with others. This union is achieved in communities, within a culture, and through language, all of which are necessary in living the faith. Language is essential to the purpose and end of man because it is so fundamental to his existence, his nature, and his culture. It affects and shapes one's perception of the world, reports and defines experience, is the method of communication, and is a symbol and means of group identity and solidarity. Through the revitalization of language, culture is restored because language and culture together are based upon the reality in which one lives, and they also create and mold that reality. Through the process of inculturation the dialogue between culture and faith is purified, enriched, and strengthened, and the human person develops toward full and true humanity through the integration of faith and culture. Inculturation, which is a responsibility we must all embrace, is achieved through the efforts of the people within the culture and the faith. What is the mission of the woman within this culture in her roles as daughter and student, professional, and wife and mother, in order to fully participate in the restoration of culture and faith?

**Stalzer, Carolyn, Carolyn Crump, Razeena Ibrahim, Yazmin Salgado,
EXPLORATORY FACTOR ANALYSIS OF THE PARENTING BEHAVIOR
INVENTORY, Dr. Robert Weis, Psychology**

Our study investigated the validity of a self-report instrument of parenting behavior, the Parenting Behavior Inventory (PBI). The PBI was designed to measure three parenting dimensions: control, warmth/supportiveness and hostility/coercion. Baumrind (1991) identified the dimensions of control and warmth, which reflect the level of discipline and affection parents show to their children, respectively. Previous research has proposed that a third parenting dimension, hostility/coercion, can be used to predict the risk of child abuse and child maladjustment. Approximately 800 mothers of children aged two to six years completed the PBI. Exploratory factor analysis was performed on the data in order to establish construct validity and confirm the dimensions that the PBI measures.

**Stalzer, Carolyn, HOLISTIC HEALING: INCORPORATING SPIRITUALITY
INTO ART THERAPY, Sr. Paula Jean Miller, F.S.E., Catholic Studies**

Art therapists guide clients in artistic expression as a means of psychological healing. Like much of psychotherapy, art therapy contains numerous models for treating the patient. In this project various models of art therapy, both spiritual and non-spiritual, are examined in their approach to the human person and suffering. In any psychotherapy it is essential to begin with a proper understanding of the human person and then treat the client in a holistic manner, recognizing mind, body and spirit. Addressing the client's spirituality is important not only because it is fundamental to the human person but also to better effect healing. In addition, an understanding of the Christian meaning of human suffering allows the therapist and the client to recognize psychological suffering as an opportunity for self-examination and growth. The goal of therapy should go beyond seeking a cure for the symptoms and provide true healing that will lead to continued strength and positive growth. However, many of the examined approaches to art therapy seem to lack a true understanding of the human person and the role of suffering. Even the current "spiritual" approaches to art therapy ignore the theistic dimension of man's experience. Therefore, I propose a more theistic approach to spiritual art therapy that is rooted in the true nature of the human person. This proposed model includes guiding the client in exploring his or her spirituality and in coming to a fuller understanding of the role of suffering in his or her life.

**Suniga, Matthew, DISCIPLESHIP: THE FORCE FOR LEADERSHIP, Dr. Michele
Simms, BSAD**

Many civic leaders and business pacesetters in our own communities are persons of profound religious faith. Dr. Robert H. Schuller, renowned Protestant minister and self-proclaimed "possibility thinker" has written and preached extensively on the topic of visionary leadership. Dr. Schuller has developed four points of Christian living as a foundation for building up visionary leadership among persons and organizations. These

points are: faith is a fact, not a fantasy; faith is a force, not a value; faith is a decision, not a debate; faith is a commitment, not an argument. The Catholic philosopher, Dr. Peter Kreeft has also stated that Jesus Christ never instructed his disciples to love humanity in terms of a conceptual abstraction. Christ would rather we love our real neighbor, the person with whom we interact. Using the works of Drs. Schuller and Kreeft, and current research on prevailing models of institutional leadership, I will examine how authentic Christian discipleship can be a force for leadership in our businesses and community organizations.

Wells, Michael, Nikolay Sirakov, GEOMETRIC HEAT EQUATION WITH ELASTICITY FOR MEDICAL IMAGE SEGMENTATION, Dr. Michael Colvin, Mathematics

This talk presents a work, which is a natural continuation of an approach based on the geometric heat differential equation and vector flow used to segment an image to shells. The advantage of the shells approach is the large capture range and very fast medical image segmentation, but on the other hand it is not able to converge into spiral deep concavities. The main contribution of the present study is the added elasticity that preserves the above features and lets the active contour converge quickly into spiral concavities. Another advantage is the new penalty function, added to the geometric heat equation, that makes it capable of working with color images of varying size, and could also be used for noise cleaning. We created a tool in C++ based on the theoretical concepts developed. The stability condition, truncation error and calculation complexity of the algorithm are determined. The C++ tool is capable of automatic segmenting X-ray and MRI medical images that contain multiple objects. To validate the theoretical concepts a set of experiments were performed. The obtained results together with the run time are given in the paper, comparing them with other segmentation methods working in the field.