

**ABSTRACTS OF
THESIS PROJECTS
SPRING 2011**

BAYLOR HONORS COLLEGE

**The Honors Program
University Scholars**



BAYLOR
UNIVERSITY

HONORS THESIS ABSTRACTS

2011 GRADUATES

Daniel Abernathy, University Scholar

Dr. David Corey, mentor

International Law and the Just War Tradition

My thesis asks why the use of force by states is guided, constrained, and evaluated by two conflicting moral traditions – just war and international law - rather than one. I propose that each tradition serves a distinct purpose and that their ends could not be achieved by a single, merged moral code. I examine the reasons for the co-existence of these traditions by answering the following three questions: First, what are the limitations of the just war tradition that made international laws of war a necessary addition to the moral thinking on war? Second, what are the limitations of international law that spurred a renewed interest in just war thinking during the 20th century? Third and last, to what extent is it possible – and desirable – for international law to better reflect just war principles? After answering these questions, I will conclude my thesis with a discussion of the impact on these traditions of changing themes in international relations. I will briefly discuss issues such as the increasing importance of international humanitarian law, the stronger focus on terrorism after the September 11th attacks, and the increasingly common experience of unconventional warfare.

Brittany Ashby, Mathematics

Dr. Lance Littlejohn, mentor

Women in Mathematics

Even though women can be just as talented as men in the field of mathematics and are capable of receiving the same educational degrees as men, women will continue to have a weak presence in the world of mathematics unless the social stigma that exists of just being a woman in a professional field is eradicated. In this study, women who have succeeded in their efforts to work in mathematics will be reviewed to show that women can and have made numerous contributions to the mathematical community. Although there are many factors involved in finding employment, the main hindrance to women is that they are not seen as truly equal to men in the work place.

Denise Ashley, Biology and Medical Humanities

Dr. James Marcum, mentor

Hypocritical Healers: From Human Experimentation to Patient Autonomy

The horrors of Nazi medical experimentation shocked the world. Most Americans, however, assumed that such things could not happen in America, despite questionable American experiments, such as Ancel Keys' starvation studies, occurring at the same time. After attempts to legislate ethics through the Nuremberg Code were shown to be imperfect, truth about the Tuskegee Syphilis Study brought the problem of physician abuse of patients close to home. The distrust fostered from these atrocities, combined with other societal shifts, led patients to apply the idea of informed consent to their own physician interactions, forever changing the face of medicine with respect for patient autonomy. While autonomy will remain a part of the patient-physician relationship, physicians must work to rebuild the lost trust so that true healing can occur.

Jennifer Atwood, Great Texts and Museum Studies

Dr. Sarah Jane Murray, mentor

"It is Miraculous in Our Eyes": Architecture and Meaning in the Miracles of Saint James

By the twelfth century, the shrine of Saint James the Major at Santiago de Compostela was the third largest pilgrimage site in the medieval world, after Jerusalem and Rome. The *Codex Calixtinus*, a twelfth-century illuminated manuscript attributed to Pope Calixtus II and housed in the archives of the Cathedral of Santiago de Compostela, sought to codify the legend of Saint James and the practices of his medieval cult. In my thesis, I examine the way in which the collection of twenty-two miracles performed by Saint James contained in Book II of the *Codex Calixtinus* contributes to this codification, particularly drawing together the complex variety of characteristics possessed by Saint James during the height of his fame: fisherman and soldier, pilgrim and liberator, distinctly Galician and broadly universal. In order to accomplish this, I situate the miracles within their proper historical and codicological contexts and provide an in-depth analysis of the architecture of Book II.

Joshua Bailey, Religion and Biochemistry

Dr. Jonathan Tran, mentor

Transformation Within the Prison of Pain: The Significance of Empowered Vulnerability and Silent Prayer for Chronic Pain Sufferers

Pain is a biological necessity. However, chronic pain is understood as pathology void of biological or evolutionary significance. This lack of biological import in conjunction with the postmodern conception of the body amplifies the futility and isolating effects felt in suffering chronic pain. This thesis addresses the inherent hopelessness in these modes of speaking of chronic pain by attaching theological meaning to chronic pain through Sarah Coakley's development of empowered vulnerability. Through this notion of divine strength made perfect in human weakness, I elucidate the efficacy of silent prayer as an embodied practice that transforms the meaning of chronic pain and upends its isolating effects by enabling personal and political incorporation into the Trinitarian life.

Evan Bassler, University Scholar

Dr. Phillip Donnelly, mentor

Symbolism, Light, and the Stella Maris: Mariology in Tolkien's Lord of the Rings

Most readers of J.R.R. Tolkien's *Lord of the Rings* trilogy come away with some conception of a Christian element in his work. However, Tolkien makes it very clear that he dislikes "allegory" and therefore the scholarship on his work often relies upon general statements about Christianity or relies upon his philological studies. In this thesis, I argue that Tolkien's own distinction between different types of allegory, found in his essay "On Faerie Stories," encourages the reader to make connections to Christianity. Then I trace Tolkien's theme of light from its inception in the *Silmarillion* to connect his subsumed religious element with Mariology as seen in the character Glorfindel. I will then demonstrate how his Christian element culminates at the scene of the Cross-roads in *The Two Towers*. This concludes with a consideration of the symbolic and religious importance of Tolkien's use of March 25th for the date of the destruction of the Ring of Power.

Katie Jo Baumgardner, University Scholar

Dr. Jerold Waltman, mentor

The Garbage Can Model and Education: A policymaking analysis of the Healthcare and Education Reconciliation Act of 2010 and its effects on the American Community College System

When it was signed on March 30, 2010, House Resolution 4872: the Healthcare and Education Reconciliation Act of 2010, was touted as a landmark reform bill for the fields of healthcare and higher education. Political scientist John W. Kingdon provides a revised policymaking model that modifies the popular Cohen-Marsh-Olsen garbage can model to explain how landmark reform occurs in American government. Kingdon's model proposes that three streams—problems, policies, and politics—converge to create a policy window; this window allows for landmark legislative reform to take place. By using Kingdon's model as a framework, I examine how community colleges became a top agenda item for the Obama Administration, and how Kingdon's three streams coupled to create a policy window that resulted in \$2 billion worth of competitive grants to community colleges for the purpose of providing support to educational and career training programs.

Maithilee Bedre, Biology

Dr. Erica Bruce, mentor

Differentiation and immortalization of a myoblast progenitor cell line for application in in vitro toxicology

The influence of cell cultures in evaluating toxicity has been studied in the C2C12 mouse myoblast progenitor cell line. A similar primary cell line from Weddell seals needs to be studied to understand seal skeletal muscle adaptations to diving. To accomplish this goal, an immortalized Weddell seal cell line needs to be initiated. Through a series of laboratory techniques used in *in vitro* toxicology, we will attempt to immortalize the C2C12 cells. The primary progenitor cells will first be differentiated into skeletal muscle, which will further be characterized by immunohistochemistry and immunocytochemistry using markers and counter stains. The obtained skeletal muscle cells will next be used to initiate an immortalized cell line by utilizing immortalization techniques using the Simian Virus (SV40) vector. Via cloning by limited dilution, one cell from the immortalized cell line will be isolated to initiate the immortalized culture that will further be used in future experimentation. Such techniques will then be repeated on a seal cell line to determine what toxins are fluxing in the seal environment to produce a hypoxial state in the seals. Using *in vitro* toxicology, the cause of a decrease in seal populations, hypothesized to be due to an environmental chemical influx from melting of the polar icecaps, can be examined through a cellular and molecular approach.

Benjamin Belz, Environmental Studies

Dr. Julie King, mentor

Shell's Environmental and Human Rights Offenses in the Ogoni Region of Nigeria

The Niger River Delta region of Nigeria holds vast oil and natural gas reserves. These reserves have drawn the attention of multinational corporations like the Royal Dutch Petroleum Company, commonly known as Shell. The activities of Shell and other large oil companies in this region have caused major environmental damage. The Ogoni began to protest these environmental damages led by Ken Saro-Wiwa who started the Movement for the Survival of the Ogoni People. Through this group Saro-Wiwa led the Ogoni in nonviolent protests of Shell's damaging activity in area. These activities ultimately led to some to resent Saro-Wiwa and he was eventually arrested and executed under questionable circumstances. Ken Saro-Wiwa Jr. led a group of Ogoni in a case against Shell in district court in New York City. Ultimately Shell settled with the Ogoni out of court for \$15.5 million.

Rebecca Bovio, English

Dr. Dianna Vitanza, mentor

Dickens' Character Archetypes: The Solution to Socioeconomic Tension in Victorian England

In Victorian England, citizens did not wholeheartedly examine or attack the issue of socioeconomic equality. Rather, a working middle class began to grow and upper-class citizens began to look upon the lower class with shame and disgrace. This thesis analyzes Charles Dickens' character archetypes in order to explore his solution to this socioeconomic problem. Throughout most of his novels, Dickens presents the reader with extremely poor or destitute characters in order to awaken his readers to the plight of the poor. Dickens' novels also present benevolent characters, while he uses as an example for his readers to imitate. He also creates several working, middle-class characters that demonstrate the incorrect way to view the lower class. My last chapter ties all types of characters together showing that humanity comes full circle. Every member of each socioeconomic class has the potential to be connected through acquaintances, intimate relationships, or situations. Therefore, citizens must take responsibility for one another, claim a common humanity, and reach out to lower class citizens on an individual basis.

Ashley Brenstein, Medical Humanities

Dr. James Marcum, mentor

The Need for Narrative Medicine as Demonstrated through Adhesion Complications

In the health care world, medicine continues to progress rapidly through means of new technology and clinical procedures. Accordingly, one might argue that physicians are treating their patients more effectively, and yet general sentiment suggests that patients feel increasingly isolated from their physicians. This thesis addresses the ways in which the biomedical approach fails its patients, particularly those with chronic illnesses, and the subsequent need for more patient-centered approaches. One example of such an approach—and the focus of this thesis—is the popular narrative medicine movement. A particular type of chronic disease, adhesion complications, is utilized as a case study to contrast the biomedical and narrative methods. Arthur Frank and Rita Charon's narrative frameworks are used to analyze the patient's story in such a way that the narrative supplements the biomedical approach and enhances the physician's understanding of adhesion complications. My thesis proposes that this combination of biomedical and narrative methods optimizes patient health care and that it can be further applied to any chronic illness.

Kristin Brown, Biochemistry

Dr. Sung-Kun Kim, mentor

Antibiotic Resistance in the American Healthcare System

Antibiotic resistance has become a serious problem for the healthcare system in the United States. Every antibiotic on the market has had clinically significant resistance develop against it. Causes of antibiotic resistance are many, but include ignorance of patients, inappropriate prescribing, failure to track infections on a national level, and a lack of new antibiotics under development. The mechanisms of antibiotic resistance develop via natural selection in the bacterial population, and can be passed between members of different species. This thesis explores the causes of antibiotic resistance on a macroscopic and microscopic level and proposes a federal program that would aim to reduce antibiotic resistance and improve antibiotic prescribing practices in the United States by targeting multiple sources of antibiotic misuse and overuse.

Alexis Casiano, Anthropology

Professor Carol Macaulay, mentor

Evidence of Deer-Hide Processing Activities at the Upper Sprague Site in Hamilton County, Texas

Three features found from 2008 to 2009 were analyzed during the 2010 Baylor Archaeological Field School at the Upper Sprague Site in Hamilton County. Features 6 and 10 are shallow basins averaging a meter in length and 80 cm in width, measuring 15 cm in depth. These were found side by side at the same elevation, and oriented in the same direction. Feature 9 is a circular pit hearth which contained charcoal, found directly to the northeast of Features 6 and 10. This pit hearth is similar in size to those documented by Binford (1967) as smudge pits used to smoke hides. In order to understand the purpose of these three features, the hypothesis put forward, postulates that the two shallow basins and the pit hearth found at Area D represent deer hide processing facilities- soaking basins and a 'smudge pit'. Ethno-historic accounts and experimental hide processing have been researched and support the hypothesis presented here.

Karen Caylor, Great Texts

Dr. Phillip Donnelly, mentor

The Reader's Education in Paradise Regained

While many scholars have discussed the way in which John Milton hopes to educate his readers in *Paradise Lost*, fewer have examined this in his lesser-known brief epic, *Paradise Regained*. I aim to examine the reader's education by first trying to understand the education of the epic's protagonist, the Son of God. As he is tempted by Satan in the desert, the Son grows in self-knowledge and in his practice of the four cardinal virtues in preparation for his earthly ministry and his ultimate sacrifice for the redemption of mankind. In each of the chapters of my thesis, I will examine one of the virtues – prudence, temperance, fortitude and justice – in its classical and Christian conceptions and then discuss how the Son demonstrates the virtue in his actions and words in a way that draws the reader into participation with him in the virtue.

Fu-Chieh Flora Chang, Political Science

Dr. Curt Nichols, mentor

The Dropping of the Atomic Bombs: An Analysis of President Harry S Truman's Postwar Justifications

This thesis investigates President Harry S Truman's post-World War II justifications for dropping the atomic bombs on Japan. It uses case study analysis to investigate three claims that Truman made about his decision. Namely, it explores: whether the casualty/fatality estimates for an invasion of Japan were accurate; if alternative solutions were really considered, and whether the target cities were selected for their military value. A "validity" index is constructed, and Truman is scored in each case. Scores are determined by looking at Truman's own words and analyzing them in light of arguments that critics and defenders have presented in scholarly debates. Final evaluation reveals that while Truman's justifications were never fully valid they were not lies or completely invalid either. In the end, it appears that he almost always used some embellishment to foster patriotism and secure his place in history.

Travis Chapman, Neuroscience

Dr. N. Bradley Keele, mentor

Neuroepigenetics of Learning and Memory

Long-term memory formation requires changes in gene expression. One mechanism for altering gene expression involves chemical modifications of DNA or its associated histone molecules. These “epigenetic” tags have long been studied by developmental biologists for their role in cell differentiation, but recent evidence suggests they also coordinate behavior in terminally differentiated neurons. Epigenetic chemical modifications include DNA methylation as well as histone methylation, acetylation, phosphorylation, ubiquitylation, and sumoylation. DNA methylation and histone modifications—in particular acetylation, methylation, and phosphorylation—play a key role in regulating memory-related behavior. Moreover, neuroscientists investigating epigenetics have identified potential targets for therapeutic intervention in diseases like Alzheimer’s, especially with regard to histone deacetylases (HDACs).

Kathryn Craig, International Studies

Dr. Sara Alexander, mentor

The Choice: An Investigation of Infant-Feeding Methods of HIV-Positive Mothers and the Reasons Behind Them

Every mother has to choose how to feed her infant but HIV-positive mothers have higher stakes in the choice. Mother-to-child transmission of HIV through breastfeeding is still an issue today while formula feeding produces possible issues of prohibitory costs and malnutrition. The infant’s HIV status also comes into play thanks to early infant diagnosis through the dried blood spot test. This thesis explores the reasoning behind the infant-feeding method choices that mothers in Zambia are making and aims to discuss the advantages and risks and the importance of making these known to HIV-positive mothers.

Hannah Decker, University Scholar

Dr. Timothy Heckenlively, mentor

Politeia, Kingdom, and Soldierly: Reframing the Discussion about Christian Attitudes toward Warfare before A.D. 325

There is no prevailing consensus about the early Christian attitude toward the military, as traditionally the discussion entails either over-parsing a handful of New Testament passages which mention soldiers, swords, peace, etc., or overemphasizing the documented presence of a handful of Christians in the Roman military. In this thesis I propose that early Christian thought on the issue actually had its context in the broader issues of heavenly kingdom, heavenly *polis*, and heavenly citizenship. Surveying the New Testament, Septuagint, select second and third century writers, and select hagiographical texts of pre-Nicene military and non-military martyrs, I underscore the prevailing conviction that Christians have a unique citizenship in a kingdom and *polis* different from those of the Roman Empire. Furthermore, I show that proper conduct (*politeia*) in this kingdom frequently entails wielding peace on behalf of the Christian *polis*—a unique type of Christian soldiery that illuminates the honest significance of Christian military metaphors. Framing the discussion in these terms should ultimately provide more useful tools for explaining the Constantinian shift.

Alyssa DeMoss, Psychology

Dr. Tyler Horner, mentor

Children’s Conceptions of Death and Implications on Grieving

In this thesis I examine how children’s increased understanding of death changes how they grieve. I have divided the children from two to eighteen into three developmental stages: early childhood, middle childhood and adolescence. In each chapter I begin with a case study from my own experiences, as a nanny to children who recently lost their mother. Each chapter includes a developmental overview, a literature review of the age group in terms of understanding death and coping, and then an analysis of how the developmental characteristics relate specifically to grieving and coping. Lastly, I conclude by relating the information to my personal case and providing ideas for helping children at each age cope healthily with death.

Lisa Do, University Scholar

Dr. Hugh Riley, mentor

The cross-cultural associations of romantic attachment theory, jealousy, and oxytocin

Within the context of social psychology's field of relationships, does the distinction between an intimate culture and an aloof culture correlate with higher incidences of a particular romantic attachment style? Of equal importance, how does cultural background influence a predisposition to romantic jealousy, and to what degree? One neuropeptide, oxytocin, has been implicated in various prosocial behaviors, which possibly promotes attachment and pair bonding. Intimate societies will have increased tactile contact between husband and wife, which suggests higher incidences of the secure attachment style. To find associations, we will compare the implications of the three romantic attachment styles (secure, anxious-ambivalent, and avoidant) and the intensity of jealousy emotions (anger, sadness, and fear) to whether a culture is categorized as aloof or intimate.

Clayton Dorsa, Biochemistry

Dr. James Henderson, mentor

Clinical Physician Incentives determined through Referral Patterns

Primary care physicians face ethical dilemmas in providing quality care to patients. One of the most significant dilemmas is the incentive of patient procedure at either a non-profit hospital or primary care clinic. Financial classes categorize patients and indicate reimbursement of physicians for the cost of care. Referrals to a hospital or clinic for a financial class reveal potential patterns by each physician. The study conducted with Hillcrest Baptist Medical Center uses economic referral data from Midway and Bellmead clinics to determine referral patterns from primary care physicians to specialists and Hillcrest Hospital. Pattern identification is useful in developing a forecasting model for inpatient admissions and outpatient procedures based upon financial class, diagnosis-related groups, and gender.

Jonathan Drake, University Scholar

Dr. Gregory Hamerly, mentor

Accelerated k-means clustering

The k-means algorithm is a widely-used method for automatically clustering vector data. We propose an acceleration that computes the same answer as the standard algorithm in substantially less time. Like Hamerly's and Elkan's accelerated algorithms, our algorithm avoids unnecessary distance calculations using distance bounds and the triangle inequality. For each point, Elkan keeps k lower bounds and Hamerly keeps 1, but we keep b bounds corresponding to the b closest centers, sorted in order of increasing distance. For sufficiently large k , experiments show that our algorithm is competitive with or faster than other methods on datasets of medium-high dimension, e.g. about 20-120 dimensions.

Kristina Edwards, International Studies

Dr. J. Mark Long, mentor

The Economic, Cultural, and Religious Implications of Child Marriage in Yemen

Within the past decade, child marriage has become an increasingly controversial topic in Yemen. The United Nations defines a child marriage as one in which either or both parties are below the age of eighteen. In Yemen, approximately half of all females who marry are still children at the time of marriage, according to this definition, and the average age of marriage for females is twelve to thirteen years old. The minimum marriage age was abolished in 1999, demonstrating the struggle facing Yemen's lawmakers in a modern context. This thesis analyzes the economic, cultural, and religious justifications that prop up the institution of child marriage in Yemen.

Addressing each of these perspectives, I demonstrate that parents who allow or force their daughters to marry before reaching adulthood are making a financially unsound decision, regardless of economic background. Likewise I establish that, contrary to the popular opinion that child marriage is an expression of Yemeni cultural values, child marriage is at odds with the high value that the Yemeni people place on both collective and individual well-being. I also show that abiding by religiously-based values in present-day Yemen necessarily opposes the contracting of child marriages. Finally, as a recommendation to Yemeni parents and families, I propose financially, culturally, and religiously feasible alternatives to contracting marriage too soon for their daughters.

Suzanna Frey, Child and Family Studies

Dr. Joyce Nuner, mentor

A Study of Sunday School Teacher Training Across Texas

Sunday school teacher training is an important part of this ministry in that it prepares the teachers to train up the next generation of churchgoers. The purpose of this research project was to determine the types of training that Sunday school teachers in three denominations across the state of Texas have had prior to their work as Sunday school teachers. Despite the prevalence of Sunday school within churches, no published research on the types of training for Sunday school teachers across denominations is available at this time. Respondents from the Southern Baptist Convention, The Episcopal Diocese of Texas, The Episcopal Diocese of West Texas, and the Texas Lutheran Convocation completed the Sunday School Teacher Survey and the Church Demographic Survey to determine the types of training received by Sunday school teachers and the types of training the Sunday school teachers found most useful to their work in the church. Study results supported the importance of training in areas such as ages and stages of child development, faith development, curriculum/teaching training, and classroom management. In addition, the results supported the importance of and need for training for Sunday school teachers.

Chelsea Garrett, Forensic Anthropology

Dr. Lori Baker, mentor

Bioarchaeological Analysis of Human Sacrifice at El Zotz and Yaxha, Guatemala

Human sacrifice is a practice that has occurred in the Maya world for thousands of years. There are diverse styles of ritual and reasoning behind the act of human sacrifice among the Maya regions. There are similarities in what anthropologists are describing as sacrifice and how to distinguish it from other mortuary practices. The Maya of Guatemala performed ritual sacrifice for many reasons, primarily to please the gods in times of crisis; however, other reasons consist of violence in warfare and companion burial involving royal figures. // This project consists of skeletal analyses of Maya sacrifice victims from the sites of Yaxha and El Zotz, both located in the Petén Jungle of the Guatemalan lowlands. Biographical profiles of the victims are formed using data from craniometrics, stature estimations, as well as age and sex determinations. The profile, known as an osteobiography, provides necessary data to the anthropologist pertaining to who the individual was and how they came to be deposited in their final resting place. // The individuals examined for this project were sacrificed under different circumstances. The Yaxha burial was examined subsequent to excavation from a plaza epicenter. The burial consisted of both surprisingly intact cranial and postcranial elements. Upon further analysis, the suspicious manner in which the individual was buried was determined to be a rather clear representation of human sacrifice, probably corresponding to warfare. The El Zotz remains consisted of six subadult skeletons. They were excavated from a royal tomb, alongside an elite figure. There was little evidence to indicate a clear cause of death. Extensive skeletal analyses were performed on all of the skeletal elements. The osteobiographies help determine the context of the burials, and what role Maya sacrifice played in the demise of the victims.

Jeremy Goss, Political Science

Dr. Joseph Ferraro, mentor

Engineering Lower Metabolism Rates and Greater Fat Stores in Newborn Famine Victims Through the use of Prenatal Hormonal and Chemical Supplements

Obesity has quickly become one of the leading health concerns in the United States. Once believed to be the most preventable form of disease, recent studies have concluded that chemicals found in plastics could be contributing to a predisposition toward obesity by manipulating metabolic factors and disrupting fat cells. In this thesis I will summarize literature from studies documenting an association between Bisphenol A (BPA) and other endocrine-disrupting chemicals and the development of obesity and propose the use of such substances to augment world aid efforts in famine stricken countries.

Katie Grover, University Scholar

Dr. Jonathan Tran, mentor

Globalization Politics: Violence in the Political Theory of Slavoj Žižek

The philosophy of Slavoj Žižek builds on the principles of psychoanalysis and the tradition of the German Idealists to establish a critical reaction to contemporary events. In the process, everything is brought into question, from the significance of Starbucks as a symptom of the accepted social system, to the basis of Christianity and the genesis of terrorism. In this thesis, critical works by Slavoj Žižek are examined in order to analyze Žižek's claim that violence is inherent to political action in the era of capitalist globalization. The analysis raises several questions: What constitutes a true Žižekian political act? How does this action relate to Žižek's concept of ethics? How are these conclusions shaped by Žižek's own fundamental political philosophy? Posing these questions provides the thesis with the framework necessary to investigate the implications of the political theory of Slavoj Žižek.

Kelly L. Gruen, University Scholar

Professor Loeen Irons, mentor

Oral-Genital Stimulation: A Look at How Oral Copulation Has Been Viewed Throughout History and Its Role in Adolescent American Society Today

The human experience is propelled by sexuality. Throughout history the parameters of sexuality have been redefined. The generally accepted traditional definition of sexuality is based off of Judeo-Christian principles and is largely tied into procreation. This paper explores the ways in which sexual boundaries have widened over the years and now embrace different aspects of physical love, specifically oral-genital stimulation. The concept of oral sex is generally accepted by the culture of adolescents in America today. Current research does not suggest that oral sex has become an epidemic among America's teenagers, as many have feared. However, the acceptance of such behavior among today's youth will have implications on their emotional and physical health in the near future.

Cory Hanks, Biology

Dr. Kenneth Wilkins, mentor

A Comparative Study of Wing Morphology and Echolocation Call Characteristics among Sympatric Bat Species in Sam Houston National Forest

The effect of prescribed burn management on the forest-dwelling bat community in southeastern piney forests is not well understood. Through comparative study of wing morphology and echolocation call characteristics, we can better understand and address resource partitioning in sympatric bats. We conducted our study in eastern Texas in Sam Houston National Forest (SHNF), a large tract of mixed pine-hardwood forest, characteristic of the southeastern United States. The study was conducted during the summer of 2010 in managed (Kelly Pond) and unmanaged areas (Henry Lake Creek) of SHNF. We expected to find clutter-intolerant species in higher numbers in managed areas, and clutter-tolerant bat species in higher numbers in non-managed areas. We netted bats using triple-high nets, and recorded their species, age, sex, and reproductive status. We took digital pictures of the wing and tail membranes and recorded echolocation calls. We captured 137 bats total, belonging to six species: Seminole bat (*Lasiurus seminolus*), evening bat (*Nycticeius humeralis*), eastern red bat (*Lasiurus borealis*), big brown bat (*Eptesicus fuscus*), tricolored bat (*Perimyotis subflavus*), and southeastern myotis (*Myotis austroriparius*). MANOVA analysis showed that the three most abundantly caught bat species differed significantly in respect to wing loading, mean characteristic frequency, and mean duration ($P < 0.0001$).

Jennifer Harris, University Scholar

Dr. Joyce Nuner, mentor

Infant Child Care in Perspective: History, Effects, and Perceptions

In recent decades, the rate of labor force participation by working mothers with infants has risen dramatically. When a mother works, she must find someone else to care for her children in her stead. Nonmaternal child care for infants is a controversial issue in our society, and has been both praised and condemned by various experts. This thesis will examine the history of nonmaternal child care to show that it has existed in various forms throughout human history and is not an abnormal construct of the past 50 years. Then the research pertaining to the effects of nonmaternal child care on infants will be reviewed, to form a basis for examining the benefits and challenges to parents of using nonmaternal child care. Finally, the role of the media in influencing public opinion about infant child care will be examined.

Joseph Hawkins, English and Political Science

Dr. Joe Fulton, mentor

"Well-Directed, Honest Toil": The Concept of Citizenship in the Life and Rhetoric of Frederick Douglass

During Reconstruction, Frederick Douglass championed the virtues of self-reliance and self-creation. He castigated the federal government for failing to ensure that African-Americans enjoy their rights as enshrined in law. Despite this agitation, he believed that legal rights were insufficient for one to attain full citizenship. One must live in a certain way. This way of life is encapsulated in Douglass's speech, "Self-Made Men." But Douglass did more than simply exhort his listeners to a certain way of living; he lived out his philosophy of individualism. Examined in context, Douglass embodied the philosophy that the transcendentalist, Ralph Waldo Emerson, expounded in his speech, "The American Scholar." In fact, Douglass lived out Emersonian values before Emerson even articulated them. Lastly, Douglass's message of individualism is relevant for today's public discourse because of its historical significance, transcendence and nobility.

Robert Hill, International Studies

Dr. Linda Adams, mentor

Militarism and Israel: Origins and Development of Cultural Militarism in Israeli Society and Politics

This thesis traces the evolution of Israeli militarism from its roots in 19th century European ideology to the contemporary era but concentrates on its development during the British Mandate period in Palestine. Though the Jewish nationalist movement was founded on non-aggressive and predominantly socialist principles, a belligerently expansionistic interpretation of Zionism began gaining ground in the Yishuv in the mid-1930s and has since come to legitimize the use of force as a political instrument. This paper studies the intellectual and material development of the Yishuv's paramilitaries from early defense cooperatives like Bar-Giora and Hashomer to the creation of the Haganah and Palmach as well as Revisionist Zionist militias like the Irgun and Lehi. Cultural militarism did not wither, however, with the consolidation of Jewish militias into the Israeli Defense Force (IDF) and the creation the State of Israel in 1948. Instead, militant individuals and ideologies from across the political spectrum became intimately involved in domestic and foreign policy making at the highest levels. Subsequently, cultural militarism continues to pervade the Israeli polity and contributes to the perpetuation of the occupation of the West Bank as well as the elections of infamously hostile individuals like Yitzhak Shamir, Menachem Begin, Yigal Allon, and Ariel Sharon to positions of power and the encouragement of extremely bellicose national policies.

Bing Hui, University Scholar

Dr. Gouri Jas, mentor

Conformational Dynamics and Interactions of AngiotensinIII and AngiotensinIV

Hypertension is a leading cause of cardiovascular disease, which is responsible for the most deaths worldwide. Blood pressure is regulated primarily through the Renin Angiotensin Aldosterone system, and understanding the molecular conformational dynamics of angiotensins can pave the way for more effective drug design. In this study, temperature-dependent fluorescence spectroscopy and far-UV circular dichroism spectroscopy, at various pHs and various concentrations of urea denaturant, were employed to provide insight into the conformational dynamics of AngiotensinIII (AngIII) and AngiotensinIV (AngIV). The results surprisingly suggested that AngIII, the longer peptide, assumes a less ordered and more exposed conformation than does AngIV. AngIV at physiological pH and temperature (an intermediate stage of its heat denaturation process) also seems to adopt a relatively stable conformation. Furthermore, a more acidic environment seems to induce more exposed conformations for both AngIII and AngIV.

Tom Hu, Biology

Dr. Vincent Yang, mentor

The Significance of Battle of Red Cliff Before The Three Kingdoms

The Three Kingdoms era (220-280 AD) was relatively short compared to the duration of other dynasties such as the previous Han Dynasty (206 BC – 220 AD). Yet this short period of eighty years has been filled with countless battles and events that were eventually collected by Luo Guanzhong during the Ming dynasty and reproduced as one of the four most influential and popular literary work of Chinese history: Romance of the Three Kingdoms. The Three Kingdoms period marked an era of chaos and violence, where the central government, the Han emperors, was losing the control of warlords and was ultimately controlled by them. The dramatic decline of the Han dynasty granted a passage for warlords to expand their power and land in the name of Han dynasty. This marked the beginning of pre-Three Kingdoms. The Battle of Red Cliff was a decisive battle that determined the fate of the three warlords and marked the beginning of the Three Kingdoms. The battle will be traced from the decline of Han dynasty to the end of the battle to exhibit the tremendous effect it had over China for many years.

Amy Johnson, Philosophy

Dr. J. Todd Buras, mentor

Moral Sainthood

The purpose of this thesis is to investigate the diachronic merits and failings of Utilitarianism, Kantian Deontology, and Virtue Ethics. By comparing the lives that would be produced by complete devotion to these theories of morality, this thesis reveals the undesirable effects of single-principled theories and of a shallow conception of the good. Equating the morally best person with the person who completes only the morally best actions leads to an incomplete portrait of the saint. In addition, a saint devoted to a shallow good would be unable to achieve individual non-moral perfections.

Audrey Johnson, Language and Linguistics

Dr. Clay Butler, mentor

Frame Incongruity Misunderstanding: A Conversation Analysis Study

This paper analyzes a type of miscommunication referred to here as Frame Incongruity misunderstanding (FI misunderstanding). Goffman's (1974) frame, the participants' definitions for the situation, provides the basis for this analysis. Two hours of video-recorded data is scrutinized using Conversation Analysis (CA) methodology. From this data, two episodes which have the characteristics of an FI misunderstanding are discussed. FI misunderstandings occur when interlocutors are defining their interaction in slightly different ways, leading each to misinterpret the utterances of the other. Eventually, the misunderstanding is revealed when one of the participants makes a contribution that cannot be interpreted within the other's frame for the conversation. It is the goal of this paper to identify possible causes for the FI misunderstandings analyzed. It also describes the incongruent frames and the participants' solutions for the miscommunication.

Taylor Kohn, University Scholar

Dr. William Hillis, mentor

Atrial Natriuretic Inhibits the Production of Aldosterone in Rat Adrenal Gland Explants Cultured In Vitro

Aldosterone is a hormone produced in the zona glomerulosa and is known to be stimulated by several hormones. ANP is known to inhibit the production of individual cells of the zona glomerulosa. This study is to see if that same affect occurs when tissue sections of the zona glomerulosa is used. Aldosterone levels were measured by an ELISA technique after 24 and 48 hours' growth, with ANP administered to the variable group after 24 hours at concentrations of 240 pg/mL and 480 pg/mL. The samples taken after 48 hours were compared to the samples taken after 24 hours, to determine a percent decrease of aldosterone production. At a concentration of 240 pg/mL of ANP, a decrease in aldosterone production of 17.4% was found in the control group versus a decrease of 25.3% in the variable group containing ANP ($p = NS$). However, when the concentration of ANP was increased to 480 pg/mL, the variable group decreased 54.3% compared to a 35.2% decreased in the control ($p = <0.0005$). By comparing the percent decrease of aldosterone production, a dose-responsive curve became apparent.

Alyssa Leavell, English

Dr. Dianna Vitanza, mentor

Greek Tragedy in Tess of the d'Urbervilles

Although many Victorian authors looked to classical Greece for their subject matter and themes, Thomas Hardy is unusual in his adoption of the overarching Hellenic worldview. In his most popular and perhaps most poignant novel, *Tess of the d'Urbervilles*, Hardy relies on features of Attic tragedy to convey his own ideas about human existence. This thesis links Hardy's portrayal of fate with Sophocles' *Oedipus the King*, his characterization of Tess with Phaedra of Euripides' *Hippolytus*, and his depiction of justice with Aeschylus' *Oresteia* trilogy. These relationships provide insight into the core concepts of *Tess of the d'Urbervilles* and the mind of Hardy himself.

Foster Lerner, Biology

Dr. J. Todd Buras, mentor

Not Physicalism or Anything Close: A Defense of Interactionist Dualism by Process of Elimination

The philosophical view of physicalism is that all things that exist are matter. This thesis details reasons why physicalism (along with closely related views) fails when attempting to take account aspects of the human mind, especially consciousness. Secondly, interactionist dualism is presented as a viable alternative to physicalism. Different species of physicalism are considered and found wanting. These include eliminative materialism, reductive physicalism, and supervenience. Epiphenomenalism is also rejected from being a coherent dualist thesis on account of the nature of the human mind. Physicalism might be true in another universe, where no sentient beings existed, but certainly not in ours.

Jennifer Licero, Biochemistry

Dr. Walter Holmes, mentor

Ethnomedicine: A study and analysis of the usage of medicinal plants by Yukpa and Afro-Colombian cultures.

The performed study sought to study, in depth, the usage of medicinal plants by the Yukpa Indians located in the Sierra de Perija of the Colombo-Venezuelan frontier as well as the Afro-Colombian culture from Cartagena, Colombia. The field investigation was performed for duration of three months, two of which were spent in Venezuela; the remaining month was spent traveling to Colombia as well as other areas between the frontiers of the two countries. The data gathered yielded a finding of sixty-eight plant species. Aside from plant gathering, interviews of experts regarding the use of plants by these cultural groups were also performed. From these interviews more than seventy remedies were gathered which conveyed the ethnomedical use of plants in these areas. Aside from the conventional uses of plants to cure medical ailments, the investigation was expanded to include a sub-study of the esoteric use of plants by the Yukpa and Afro-Colombian cultures. These findings allowed for very interesting conclusions concerning the connection and influence that both the African culture as well as the indigenous groups of the area have had on the formation of the cultures present in both Venezuela and Colombia today. Some of these influences include, but are not limited to: the continuing belief in spiritual beings, the accommodation of the catholic doctrine with African pagan beliefs, and the continual usage of plants to cure spiritual rather than physical ailments.

Amy Liu, Psychology

Dr. Charles Weaver III, mentor

Event Memory Recollection in Cross Cultural Individuals: the role of Childhood Amnesia and Acculturation

Childhood amnesia is the phenomenon of how we as adults, cannot recall the first 3-4 years of our lives. This is remarkable and paradoxical because this is the period in development that affects us most significantly throughout the lifespan, socially and personally, in shaping who we are. This project will employ the phenomenon of flashbulb memory formation to measure childhood memories and the offset age of childhood amnesia for cross cultural individuals. These are individuals who were born overseas and relocated to the United States at either an early age or at an older age. The flashbulb memories will be of events significant to the history of the United States. The participants will be separated into two groups based on age of arrival to the United States, and thus it will be interesting to consider the differences in these groups' memories or absence of memories for the significant historical events. The reason behind their recollections will be examined as attributed to the phenomenon of childhood amnesia, the effects of acculturation, or perhaps and interaction between the two.

Tuan Hsing Jonathan Loh, Biochemistry

Dr. Robert Kane, mentor

Synthesis of a novel purine derivative

Toll-like receptors (TLR) have recently garnered much attention due to their role in the human innate immune response. TLR7 in particular has been the target of drug designs due to its role in the immune response against viruses. Previous studies have indicated that purine derivatives with specific substitutions at the C-2, N-6, C-8, and N-9 positions are capable of activating TLR7. I report the synthesis of novel purine derivative that fits the above stated criteria. This compound, *4-((6-amino-2-butoxy-8-hydroxy-9H-purin-9-yl)methyl)benzoic acid*, was synthesized in 6 steps, starting with 2,6-dichloropurine. Although the compound potentially has TLR7 agonistic properties, it is still currently awaiting testing to elucidate its actual immune stimulating abilities.

Christopher Mahfouz, University Scholar

Dr. David Jeffrey, mentor

"Then shall I know even as also I am known": Eschatological Hope in Mikhail Bulgakov's The Master and Margarita

This thesis explores eschatological hope as a means of recovering truth from history in Mikhail Bulgakov's (1891-1940) novel *The Master and Margarita*. I argue that *The Master and Margarita* is a manifestation of Bulgakov's spiritual pilgrimage, attempting to make sense of life amid an early twentieth century Soviet wilderness. Accordingly, I argue that this spiritual pilgrimage aligns with Paul Ricoeur's three stages in the flux of history: progress, ambiguity, and hope. In the first chapter, I outline an eschatological framework that will contextualize the method of study, situating it within the Christian Tradition. The two ensuing chapters examine the devil's pact in terms of both the violent imposition of dialectical materialism found in Marxism as well as the loss of coherence caused by the fray of competing master narratives. The final chapter considers the possibility of redemption through the recovery of truth from history as revealed through an eschatological hope. Accordingly, I end this study with I Corinthians 13:12, confessing with Bulgakov, "Then shall I know even as also I am known."

Shayan Makani, Philosophy and Political Science

Dr. Jonathan Tran, mentor

Intersecting Vulnerabilities: An Islamic Theorization of the Fragility of Cross-Species Communities

Western liberal notions of community assume that the members of a community are strictly human. However, this anthropocentric view of community brackets out the majority of all living things. In contrast to the secular philosophical notions of community that have become so deeply rooted in Western discourse, Islam provides a more progressive account of animals and community. Islamic source texts present a particularly constructive structure for guidance on how to relate to non-human animals. Three primary sources determine the status and protections afforded to animals in Islam. First and foremost, the *Qur'ān* establishes the foundational Islamic law (*Sharī'ah*). Secondly, the sayings and traditions of the Prophet Muhammad (SAAW), the *Sunnah*, collected in the *Ḥādīth*, demonstrate the guidance of the *Qur'ān* in the context of early Islam. Lastly, *Ijtihad*, or inference by analogy, permits leading Islamic scholars to reinterpret *Qur'ānic* scripture and *Ḥādīth* to better account for the evolving controversies of the contemporary world. Together, these three sources form the basis of Islamic case law and its corresponding ethical parameters.

I employ these three sets of Islamic source texts to reinterpret the status and role of non-human animals in the modern world. In contrast to animal rights, I offer a vision for animal protections based on a theological understanding of the intersecting vulnerabilities between human and animal communities. Furthermore, I argue that Muslims in the West should adopt a vegetarian lifestyle as an ethical response to factory farming. By using the notion of community as the foundation for reconceptualizing relations between human animals and non-human animals, Islam provides an avenue for its human followers to protect and respect their non-human counterparts based on the concept of communal vulnerability, rather than relying on arbitrary accounts of sameness.

Madeline McClure, University Scholar

Dr. James Marcum, mentor

Narrative and poetry as means of healing in the AIDS epidemic

Since the beginning of the AIDS epidemic in the 1980s, the writing and publication of personal accounts has been important to those coping with the disease. In the early years of epidemic, this writing was formally published as memoirs and poems. The availability of such literature fostered community among people with AIDS and allowed them to find strength despite the stigma associated with their disease. As the second decade of the epidemic began, however, formal publishing ceased and the epidemic, as well as those affected by it, was neglected. With the increasing popularity of the internet in the 2000s, AIDS regained some lost ground through blogs and online communities, which have served to increase awareness and decrease the stigma of being HIV-positive.

Rachel McCurdy, Applied Mathematics

Dr. Gabrielle Sutherland, mentor

A Study of Ancient Egypt by Studying the Pyramid Texts

Ancient Egypt is a source of constant interest and amazement. However, defining its history exactly and understanding the culture is extremely difficult. Scholars rely on a variety of sources such as art and religious or political texts to piece together timelines and genealogies and to gain insight into Egyptian traditions and religions. By considering the placement of materials, such as proximity to certain tombs, these artifacts can be dated and compared in order to track the evolution of a particular artistic style or religious belief. The Pyramid Texts found in the tomb of King Unas are particularly helpful as they are the first magico-religious writings of the ancient empire. Since their discovery in the late 1800s, they have been a vital source for comprehensive Old Kingdom society. Ancient Egyptians' changing views can be tracked by comparison with later forms: the Coffin Texts and the Book of the Dead. Religion and magic were of vital importance to Egyptians, so gaining understanding of their beliefs is essential to understanding their society as a whole.

Christopher McMillion, University Scholar

Dr. David Corey, mentor

Rawls and the Liberal Political Tradition: Universalism and the Attempt to Bridge Rousseau and Kant

This thesis is an effort to understand how the political theory of John Rawls stands in relation to the tradition of liberal political thought. His work owes a deep debt to two particular strands of this tradition. The first is the contract-based strand represented by the work of Rousseau. The second is the duty-based strand represented by the work of Kant. Working from Rawls's *A Theory of Justice* and *Justice as Fairness*, I evaluate Rawls's debt to Rousseau's work, particularly the *Discourses* and the *Social Contract*, and Kant's writings, particularly the *Groundwork for the Metaphysics of Morals* and the *Metaphysics of Morals*. Rawls's recently published lectures on the histories of moral and political philosophy also shed light on the manner in which Rawls draws from these traditions. I focus most directly on Rawls's ties to the universalism of both authors, represented by Rousseau's general will and Kant's categorical imperative. I conclude that Rawls's attempt to combine these two strands of the liberal political tradition and his heavy reliance on Kant's form of universalism results in a problematic universalism of his own that largely ignores the individual character of the citizens who make up political society.

Heather McMillion, University Scholar

Dr. David Corey, mentor

Rhetoric: War or Restoration? A Comparison of Leo Strauss and Eric Voegelin's Interpretations of the Gorgias

My thesis compares Leo Strauss and Eric Voegelin's interpretations of Plato's *Gorgias*. I primarily focus on the *Gorgias*, a series of lectures delivered by Leo Strauss in 1963 at the University of Chicago, and Eric Voegelin's *Plato*. In chapters two and three, I address each philosopher's method of reading and interpretation of the dialogue before comparing the two in chapter four. What this comparison reveals is that since Strauss and Voegelin employ very similar (if not in some cases nearly identical) methods of interpretation when reading the *Gorgias*, the difference in interpretation arises from prior assumptions concerning the nature of both philosophy and political philosophy. Strauss and Voegelin's differing opinions on these topics prove to be a driving force behind the differences in their interpretations of the *Gorgias*, thus showing that Strauss views rhetoric as a possible source of self-defense for the philosopher against the dangers posed by the city. On the other hand, Voegelin views rhetoric as a possible means of communication between the philosopher and city, thus allowing the philosopher to not only identify the ills of the city, but also, hopefully, bring about restoration.

Tara Molina, Biochemistry

Thomas McGrath, mentor

A theoretical simplified synthesis of supraicosahedral boron clusters and the characterization of two isolated 12-vertex iridium carboranes

Boron hydride clusters and their derivatives, including carboranes and metallacarboranes, form three-dimensional polyhedral structures that typically have between five and twelve vertexes. The highly stable and highly symmetrical 12-vertex, icosahedral geometry has long been seen as a thermodynamic barrier that has inhibited the practical development of "supraicosahedral" boron cluster chemistry of species with 13 or more vertexes. Traditional approaches to supraicosahedral compounds have required a two-step synthetic process involving reductive opening of a 12-vertex precursor, followed by addition of a suitable transition metal fragment that will provide the thirteenth vertex capping the newly opened 12-vertex cluster ligand. The aim of this project will be to exploit an alternative methodology whereby the cluster-opening metal reagent itself also provides the necessary capping vertex, so that the overall process occurs in a single step. Herein, the transition-metal synthon effectively binds into the boron cluster to form a metallacarborane containing more than 12 vertexes. In the following research, the attempted insertion is mediated by the theoretical removal of a thallium vertex from the carborane cluster by the subsequent formation of thallium chloride salt and the simultaneous insertion of two Iridium fragments into the cluster. Although the theoretical product was not isolated, alternate products were determined and characterized through the following research.

Matthew Moore, Baylor Business Fellows and Economics

Vincent Yang, mentor

The Protestant Church in China: A Biblical Perspective

The rapid growth of the Chinese Protestant church has attracted much attention both in China and around the world. In the non-Chinese world, there has been a great deal of interest in the goings-on within the Chinese church. This thesis differentiates and describes the two predominant Protestant movements within China, one official and one unofficial. It also looks at how Christians should evaluate the Chinese church. To this end, I set up a model based upon New Testament guidelines for church structure and activity. I then compare both movements to the model in order to determine their faithfulness to the New Testament doctrine of the church.

Jeffrey Adam Moran, University Scholar

Dr. David Arnold, mentor

Congruent Numbers and Elliptic Curves

This paper is a survey of congruent numbers, natural numbers which are the areas of right triangles with rational sides. The easiest example of a congruent number is 6, the area of the well known (3,4,5) Pythagorean Triangle. This is an old topic of study, starting with Diophantus in Ancient Greece. Famous mathematicians have investigated the problem of finding all congruent numbers, such as Fibonacci (13th century), who proved that 5 and 7 are congruent numbers, and Fermat (17th century), who proved that 1, 2, 3, 4 are not congruent numbers. This problem is still unresolved today. Congruent numbers are difficult to find. The advent of elliptic curves and Tunnell's theorem in the 1980's led to a breakthrough. The problem of finding all congruent numbers will be solved once and for all if the Birch and Swinnerton-Dyer conjecture can be proven, a highly technical conjecture which most mathematicians believe to be true. Included is a discussion of ancient and modern methods of discovering congruent and non-congruent numbers, how congruent numbers relate to elliptic curves, Tunnell's theorem, and a list of all congruent numbers less than 50.

Madison Norris, Great Texts and Spanish

Dr. Peter Candler, mentor

Lilith Redeemed: George MacDonald's Hope for Universal Reconciliation

Victorian storyteller and minister George MacDonald made waves in the Scottish Congregational Church of his day with his hope for universal reconciliation. His true legacy, however, lies in the realm of Christian fantasy, where his works have inspired many of the most well known authors and Christian thinkers of the 20th century. In this thesis, I argue that *Lilith: A Romance* (1895) represents the height of MacDonald's ability to combine fairy-tale and theology, and look to his personal life as well as his writings to interpret his belief in the possible reconciliation of imagination and faith, God and his children, and even heaven and hell.

Orhue Odaro, Biochemistry

Dr. James Marcum, mentor

Integrating Traditional and Western Medicine: The Future of Healthcare in Nigeria

Traditional medicine is the preferred form of medicine in Nigeria. However, its counterpart, western medicine, has dominated the healthcare sector since colonial times. As separate entities, both forms of medicine have failed to meet the healthcare needs of the nation. In this thesis, I discuss the influence of colonization on traditional medicine, the structure and practice of traditional medicine in present-day Nigeria, as well as the major obstacles to the development of both traditional and western medicine in Nigeria. Finally, I propose that the most efficient way by which to eliminate these obstacles and to improve the capacity of the healthcare sector is by the integration of both forms of medicine.

Jeff Olson, **University Scholar**
Dr. Luke Ferretter, mentor

Autism Fiction: An Examination of Autistic Characters in Contemporary Literature and Film

Autism is a complex neurodegenerative disorder about which the modern medical field knows surprisingly little. With the number of diagnosed cases rising exponentially, it is no surprise that contemporary writers and filmmakers have given rise to a new genre, termed "autism fiction" for the purposes of my argument. Books such as Mark Haddon's *The Curious Incident of the Dog in the Night-Time*, and movies such as *Rain Man* help to shape our cultural awareness of autism. It is through these stories that we learn not only what autism is, but also how it affects autistic people, their families, and their friends. I explore autism autobiographies as a frame of reference for an evaluation of the ethical portrayal of autism in literature and in film. When approached honestly and responsibly, autism fiction provides a link between the world of an autistic person and that of a neurotypical individual. Reading autism fiction thus becomes an exercise in empathy, and writing this sort of fiction honestly becomes a noble pursuit.

Daniel O'Shoney, **University Scholar**
Dr. Thomas Hibbs, mentor

The Journey of Christian Conversion as Seen in the Works of T. S. Eliot

During the time in which T.S. Eliot converted to Christianity, his poetry reflected the major stages this transition requires. These works have since been considered some of the most influential of the 20th century. Because of his devotion to capturing his experience, Eliot's poetry can, and often must, be read in the context of his own personal history. This thesis argues that by reading T. S. Eliot's poetry with an eye to repeated themes and imagery, it is possible to observe the pattern that Eliot believes to be intrinsic to the modern conversion process. This pattern is a move from the isolation inherent in modern society into community with God and within His Church.

Colin Pardue, **Electrical and Computer Engineering**
Dr. B. Randall Jean, mentor

Designing a Composite Right/Left-Handed Transmission Line Using Complementary Split Ring Resonators

Metamaterials are new, artificial materials that have a simultaneously negative permittivity and permeability value. This unique characteristic leads to left-handed, or backwards wave propagation. Researchers have discovered many novel applications for metamaterials, including in the field of microwave engineering. Planar microwave circuits are being redesigned using metamaterials components called the split ring resonator (SRR) and the complementary split ring resonator (CSRR). //In this thesis, CSRRs are used to create a composite right/left-handed transmission line (CRLH TL), a transmission line with both a conventional right-handed passband and the novel left-handed passband. By etching a gap in the microstrip line and etching CSRRs in the ground plane, a left-handed passband for a signal can be created. Using ADS and CST Microwave Studio software, many different designs were created. CST was used to perform electromagnetics simulations and fine tune the geometry of the CSRRs, and the simulations showed a successful design of a CRLH TL. Next, the designs were fabricated and measured, showing reasonable agreement between the measured and simulated data. This experimentally verified the successful design of a left-handed passband. From here, Baylor researchers can utilize metamaterial designs and CRLH TLs, taking advantage of the unique backwards wave propagation property, to discover new applications.

Caitlin Patteson, **English**
Dr. Robert Darden, mentor

From Storybook to Silver Screen: A Comparison of Four Disney Films against their Original Fairytales

It is common knowledge that the Walt Disney Production Company has cornered the market on children's movies with their "happily ever afters," charming princes and princesses, and catchy music. What is *not* part of the mainstream psyche is the fact that each of Disney's cartoon films was adapted from pre-existing fairy tales and children's stories. In my thesis I compare the Disney versions of *The Little Mermaid*, *Peter Pan*, *Cinderella*, and *Beauty and the Beast* to their fairy tale counterparts. Each story was chosen to represent its place in history geographically and chronologically, as well as the place it takes on Disney's history of film production.

Stewart Paynter, History

Dr. James Marcum, mentor

The Evolution of Health Maintenance Organizations

This thesis focuses on the development of Health Maintenance Organizations (HMOs) in the 20th century. While the early origins of the movement are discussed, primary emphasis is on the period from the early 1970's to the late 1990's. During this period, HMOs were introduced at the national level as an alternative delivery system for Medicare, permanently altering the spectrum of medical provider models in the United States. By the late 1990's, the number of HMO enrollees in the U.S. had grown substantially to its peak of approximately 80 million enrollees. In addition to its historical background, the overall philosophy of HMOs is studied and subsequent flaws in both HMO structure and function are examined. This last part pays special attention to the ethical and moral questions of patient care from HMOs. Cases of patient neglect and treatment shortcomings are evaluated and found to be the direct result of a business model designed for treating patient populations with a more economically efficient remedy, rather than with the most medically effective care.

Melissa Philip, University Scholar

Dr. James Marcum, mentor

Averting the Crisis: Late-term Cancer Detection in India

Cancer incidence rates continue to climb in India; yet, fewer and fewer people are receiving an early diagnosis about their disease state. As such, the cancer is given time to metastasize to various parts of the body, causing victims to undergo more intensive therapies with a decreased chance of survival from the illness. However, unlike the current stigma among the Indian populace, receiving a cancer diagnosis is not always the same as a death warrant. Early detection of growing tumors is key to survival of the patient. What strategies must be implemented to fight ignorance and fear about the issue of cancer among the widely disparate population in India? A primary goal for health policy makers and health care workers is to promote prevention techniques through dietary restrictions, screening programs, education and initiatives specific to rural and urban populations throughout the country. Assessing the factors related to late-term cancer detection is vital in a developing country like India, which is adopting Western habits and lifestyles and, inevitably, seeing an increase in diseases that are common in the West as well.

Ian Reeves, Physics

Dr. Linda Olafsen, mentor

Computational Mid-Infrared Beam Analysis

Development of viable infrared lasers relies not only on the power and wavelength generated by the source, but also on the spatial and temporal profile of the output beam. Thermal imaging is of particular interest to researchers working in the field of optically pumped semiconductor analysis as the output from many of these devices falls in the mid-infrared range. While knife edge and other beam profile analysis techniques typically are unable to capture the temporal evolution of beam profiles, real time imaging is employed in this work, using a thermal camera synchronized with a Nd:YAG pump laser via LabVIEW-controlled triggering. Coupling the synchronization with detailed imaging analysis using IDL, this new methodology is applied to the near-infrared output of an optical parametric oscillator and ultimately will be extended to mid-infrared semiconductor lasers.

Lauren Riddle, University Scholar

Dr. N. Brad Keele, mentor

Investigation of the Role of Prefrontal Cortex Serotonin in Controlling Impulsivity

This project will determine the role of prefrontal cortex (PFC) serotonin on impulsive behavior in rats. Behavior was measured on a differential reinforcement of low response rate (DRL) schedule and compared in three groups of rats. One group received selective depletion of PFC serotonin using the neurotoxin DHT, one group was comprised of sham animals who received the surgery but no neurotoxin, and the other was the control group who received no surgery or neurotoxin. Data analysis shows a statistically significant difference between the median time of lever presses between the sham and DHT groups. This reveals a behavioral difference indicating that after surgery, the DHT group was more impulsive than the sham group. The results indicate that depletion of serotonin levels in the PFC cause a decrease in impulse control.

Caterina Riley, German

Dr. Ann McGlashan, mentor

Examining the past and current situation of Germany's Migrantenkinder within the German public educational system and determining why so many fail so poorly

The situation and outcome of the so-called *Migrantenkinder* (children who are either immigrants themselves or are of an immigrant background) within the German school systems remains one of Germany's most challenging societal questions to date. This paper will examine and analyze Germany's past (beginning in the 1960s) and present, paying special attention to the roles that the political and pedagogical policies of German society have played in the outcome of such students. Furthermore, this paper will explore the influences that the various immigrant groups within German society have had that also affect the situation of *Migrantenkinder*. I argue that no one factor causes the typically poor performance of *Migrantenkinder* within the German public school systems, but rather a myriad of elements, including the very structure of the German public school systems, which has proven to be non-conducive to the integration and development of Germany's *Migrantenkinder*.

Andrew Roberts, English

Dr. Sarah Ford, mentor

Suicide in the Southern American Novel

The modernist writers of the post-WWI generation were plagued by what William Faulkner called a "universal physical fear." In the morass of alienation, disappointment, and spiritual desolation, many novelists began to explore the act of suicide in their writings. Unlike the tragedies of antiquity, Jacobean dramas, or the slew of post-Romantic novels that utilized self-murder as a major dramatic device, the suicides in modernist fiction were most often reflections of a widespread and deep-seated spiritual malaise believed to have set in over the modern world. Whereas earlier fictional suicides were particular, climactic and contained obvious motive, the deaths in novels such as Woolf's *Mrs. Dalloway* and Faulkner's *The Sound and the Fury* were unceremonious, ambiguous, and, in a sense, universal. For all of Faulkner's focus on the South, *The Sound and the Fury* remains one of the finest expressions of the modern sickness, embodying a predicament that a future generation of Southern writers would wrestle with in the decades following. Carson McCullers, Flannery O'Connor, and Walker Percy each try in their own way to answer the riddle. This thesis investigates the motif of suicide as an expression of rebellion against the modern world, from Faulkner's statement of the problem to the failed answers of McCullers and O'Connor up through Percy's success in "keeping Quentin Compson alive" and the forging of a third way.

Rachel Robinson, English

Dr. Robert Ray, mentor

Death's Role in the Christian Life: A Look at John Donne's Struggle with Death in his Christian Poetry and Prose

John Donne has a particularly unique and often metaphysical view of Christian death. Death appears frequently in his poetry and prose, though it serves several different functions within his work. For Donne, death, the soul, and the body are not isolated parts, but rather, they are each parts of a larger whole seeking reconciliation. Death is both salvific and inevitable, yet we often fear it. Donne wrestles with death and illness in the same way that he struggles with sin and temptation. At times, he wishes death would come sooner so that he may be one step closer to his eternally resurrected self. Other times, he must talk himself out of the fear of death. His works give readers, especially Christians, some ground to stand on in the face of death and loss while simultaneously raising more questions about our eternal state.

Matthew Royall, Economics

Dr. Thomas Kelly, mentor

The Future of Microfinance as a Development Strategy: Analysis of Bangladesh and the Democratic Republic of Congo

This thesis discusses the characteristics of microfinance and explores its role in economic development. The paper begins by providing insight to the roots of microfinance in Bangladesh and explains how the system benefitted the extremely poor of the region. Next, the paper illustrates the severity of poverty in sub-Saharan Africa, specifically the Democratic Republic of Congo, and investigates the impact that microfinance has had on this underdeveloped region. Finding that microfinance has experienced little success in the DRC, a discussion of the characteristic of the basic economic growth model reveals major barriers to microfinance in countries of low total factor productivity. This thesis concludes that the impact of microfinance is limited by the economic environment in which it is implemented. Further, this finding should serve as a warning to policy makers and development agencies whose expectations for the system are far too ambitious.

Cindy Salazar, Medical Humanities

Dr. Jeff Levin, mentor

Curanderos and Christianity: Exploring Religion and Health in the Mexican-American Culture

Curanderismo is a form of shamanism deeply rooted in Roman Catholicism utilized predominantly by the Mexican-American community. Within this thesis the relationship between Roman Catholicism and *curanderismo* and how this clash of worldviews is dealt with by the practitioners and participants of the practice is examined. Chapter one analyzes the effect of religion upon health and reasons for why it is important to study this field are discussed. Chapter two looks at the practice of shamanism as a whole giving a general overview of what comprises the practice, different forms of shamanism are compared, and the relationship between Roman Catholicism and *curanderismo* is identified. Chapter three explores the manner in which this unique relationship negatively and positively affects the health and well-being of its participants. Lastly, chapter four makes conclusions regarding the effects of the relationship, looks at limitations of this thesis, and suggests future research on the topic.

Andre Samuel, Baylor Business Fellows and Economics

Dr. William Hillis, mentor

In Vitro Regulatory Effects of Insulin-like Growth Factor 2 on Aldosterone Secretion in Rat Adrenal Cell Cultures

Aldosterone is one of the principle hormones involved in the regulation of the body's mean arterial pressure. As a result, it has long been the target of study for its relationship to chronic hypertension. This paper aims to identify the regulatory relationship between aldosterone and insulin-like growth factor 2 (IGF-2), a myogenic fetal growth hormone. Cultures of rat adrenal cortex cells were cultured on collagen gels. A possible inhibitory or stimulatory effect was then elucidated in vitro by measuring changes in aldosterone levels between control and IGF-2 treated cells using enzyme-linked immunosorbent assay.

Stephanie Schnabel, Biology

Dr. James Marcum, mentor

Malaria, Medicine, and Imperialism: Relationships in Nineteenth Century Africa

Malaria has always been a part of human life and history. It causes high mortality, as well as crippling populations with severe morbidity. It was influential in the history of the ancient empires of Greece and Rome. Because it is hyperendemic in tropical environments, it was a major factor in preventing European colonization of tropical Africa. The advent of improved scientific tropical medicine in the nineteenth century allowed Europeans to map out the natural history of the disease. Along with prophylactic quinine, measures were taken to eradicate the *Anopheles* mosquitoes that transmit the protozoan. These advances allowed European penetration into Africa's interior. Ultimately, its imperial activities there led to scientific racism and to the exploitation of native resources and people.

Edward Seto, University Scholar

Dr. James Marcum, mentor

From the Classroom to the Clinic: Establishing Consistency in Medical Professionalism Practices

The medical professionalism crisis in recent years has led to many debates concerning its definition, teaching methodologies, assessments, and implementation of curricular models. In addition, academic medicine alone is given the burden of teaching medical students and practicing physicians the attributes of a good medical professional. While medical societies such as the American Medical Association and the American Board of Internal Medicine have proposed definitions, the difficulty comes in maintaining consistency between what is taught in the classroom and what is practiced in the clinic. Studies indicate that a standardized, formal curriculum incorporating the principles of medical professionalism and effective role-modeling of said principles prove vital in the retention of professional characteristics by trainees. This thesis attempts to provide an overview on important aspects of medical professionalism, and then proposes a model encouraging consistency of professional actions by addressing and eradicating unprofessional practices in the informal and hidden curricula.

Ashley Simone, University Scholar

Dr. Julia Hejduk, mentor

The Seer, The Narcissist, and The Sculptor: Portraits of the Artist in Ovid's Metamorphoses

My thesis investigates three characters from Ovid's *Metamorphoses* to engage the question of who the artist is and what the artistic process entails. I argue that Ovid presents Tiresias, Narcissus, and Pygmalion as different images of the artist, and that each reveals a different trait of the creator. Although my project does not attempt to perform an extensive treatment of every example of art in the *Metamorphoses*, I show that the interconnected stories of Tiresias, Narcissus, and Pygmalion can be used as hermeneutics for understanding the role of the artist. Through Narcissus and Pygmalion, Ovid reveals that misdirected passion and narcissism are often involved in the artistic process, even as he strives to transcend the dysfunction of art as a vates, like the liminal figure, Tiresias.

Caleb Simone, University Scholar

Dr. Dwight Allman, mentor

The First Tragic Philosopher: Nietzsche's Self-Portrait in Ecce Homo

In his autobiography entitled *Ecce Homo: How One Becomes What One Is*, Friedrich Nietzsche sets out to explain who he is and how he understands his philosophy. Offering a commentary on his life and works, Nietzsche constructs a philosophical self-portrait in which he portrays himself as "the first tragic philosopher." Through this poetic image, Nietzsche suggests a coherence to his philosophy that encompasses all of his philosophical periods. Using *Ecce Homo* as a kind of hermeneutic guide, this thesis undertakes to read Nietzsche "as good old philologists read their Horace," in order to trace the development of his poetic self-portrait as the first tragic philosopher. In *Ecce Homo*, Nietzsche indicates that the origins of his "tragic philosophy" lie in this first book, *The Birth of Tragedy*. This thesis illuminates Nietzsche's self-understanding as the first tragic philosopher, therefore, by tracing its development from his first work, *The Birth of Tragedy*, to his mature philosophical period. While the tragic philosopher looks to be something like the opposite of the optimistic Socrates, or even the pessimistic Schopenhauer, since he is defined in contradistinction to both of these figures, I nevertheless argue that Nietzsche's tragic philosopher is properly brought into view only with the aid of these images. Nietzsche ultimately represents his tragic philosopher as a "Socrates who practices music," on the one hand, and the "pessimist of strength," on the other. Only through a careful explication of these images, by which Nietzsche explains and defines himself, does the portrait of the tragic philosopher come fully and properly into view.

Leah Simpson, University Scholar

Dr. Troy Abell, mentor

The Effects of Delivery Strategy Following a Previous Cesarean Section on Mother-Infant Pair Quality of Life: A Decision Analysis

When the U.S. cesarean section rate was first measured in 1965, it was 4.5%. In 2009, the most recent National Vital Statistics data showed it has risen to 32.9% and has never been higher. As more women are undergoing primary cesarean sections than ever before, the need for a better understanding of the safety of available delivery strategies for these women in subsequent pregnancies continues to grow. That is, the issue of the safety of undergoing a trial of labor after a previous cesarean section as compared to having an elective repeat cesarean section is becoming more and more relevant to the field of obstetrics and its patients. A decision analytic model was designed to determine which delivery strategy maximizes mother-infant pair quality of life. The following clinical consequences were considered: (1) Anal incontinence; (2) Urinary incontinence; (3) Uterine rupture; (4) Hysterectomy; (5) Minor maternal complications [i.e. hemorrhage requiring transfusion, postpartum infection, puerperal fever, etc.]; (6) NICU admission; (7) Mild hypoxic ischemic encephalopathy; (8) Moderate to severe hypoxic ischemic encephalopathy; (9) Maternal death; and (10) Perinatal death.

Lindsay Smith, History

Dr. Kimberly Kellison, mentor

"All the Attributes that Distinguish such a Life:" Family and Society in the Antebellum South

The Family unit is perhaps the single most important structure in Southern culture, particularly within the paternalistic world of the 19th-century planter class. Not only did the concept of family provide the groundwork for a popular argument in favor of slavery, but also supported the cultural foundation of public honor as well as enforced the genderization of southern youth. This thesis examines the relationships southern men and women shared within their family first as children, then as young adults seeking to start families of their own, highlighting how men and women identified themselves within their families and, by default, larger society differently. Finally, it looks at how the American Civil War threatened to shake the traditional views of southerners and drive the family into a more modern institution.

Melinda Soeung, Biochemistry

Dr. Mary Lynn Trawick, mentor

Structure-Activity relationship of novel low nanomolar thiosemicarbazone inhibitors of cruzain

Annually, around 16 to 18 million people in Latin America acquire Chagas' disease, and approximately 200000 of these infections are fatal. Chagas' disease is caused by a flagellate protozoan known as *Trypanosoma cruzi* and is the leading cause of heart disease in Latin America. Currently, there is no cure for Chagas' disease, and the medications that do exist tend to be highly toxic and overall ineffective after the initial infection has been established. Research has shown that cruzipain, a protease that is essential for the parasite's survival and a member of the papain family of cysteine proteases, is a validated target for potential therapeutic drugs. A microplate reader was used to perform fluorometric assays. The release of 7-amino-4-methylcoumarin from a fluorogenic substrate was monitored in a 96-well plate format to determine the concentration of compound that would inhibit the enzyme reaction 50% (IC₅₀ value). A library of substituted monobromo-benzophenone thiosemicarbazones that had produced a number of effective inhibitors of the cysteine protease cathepsin L (Kumar et al., *Bioorg. Med. Chem. Lett.*, 2010, 20(22); 6610-6615) was tested against cruzain, a recombinant form of the target protease. Several of these analogs demonstrated low nanomolar IC₅₀ values against cruzain. One compound, in particular, showed great promise with an IC₅₀ value of less than 15 nM. The 3,3'-dibromobenzophenone thiosemicarbazone that had been shown to be an effective inhibitor of cruzin was used as a reference for these experiments (Siles, R. et al., *Bioorg. Med. Chem. Lett.*, 2006, 16; 4405-4409).

Sarah South, Theater Performance

Professor Lisa Denman, mentor

A Playwright's Response to the Failing Relationship between Theatre and Christianity

Since its birth in ancient Greece, theatre has been used as a mode of worship as well as a tool for teaching and an outlet for expression. In recent decades, a rift has developed, dividing secular and religious theatre, and Christians are opting for safe Bible dramas that harken to Medieval Morality plays rather than exploring more challenging, thought-provoking works. This case study examines that paradigm and uses an original play to explore new methods to unite theatre and Christianity. The play deals with the themes of family, infidelity and faith and allows the audience to draw their own conclusions about its meaning. Finally, the process of writing, developing and staging the play is outlined, along with the reactions and opinions of the audience members.

Kaitlin Speer, University Scholar

Dr. David Ryden, mentor

Shift Dynamics on Infinite Symbolic Matrices

In this paper, we investigate the dynamics of certain shift maps on infinite symbolic matrices, namely a vertical shift, a horizontal shift, and a general shift, with both horizontal and vertical components. We establish that the general shift map is chaotic. We conclude by showing that the horizontal and vertical shift maps are topologically conjugate to a countably infinite product of shift on sequences of symbols, and that the general shift is conjugate to a vector-valued function, where each entry is a countable product of shifts on symbolic sequences composed with a shift map on sequences of sequences of symbols.

Stanley Staton, Philosophy and Political Science

Dr. James SoRelle, mentor

Swing Down, Sweet Chariot

There has not been a very good analysis on the interactions between the National Association for the Advancement of Colored People and the Student Nonviolent Coordination Committee. This thesis looks at the interaction between the two organization with an emphasis on the work done during the Mississippi Freedom Summer. This thesis looks at the organizations as having two competing perceptions on how to help black people in the United States. The NAACP followed and continues to follow a perception that working from the top-down, from legislation to change in society, is what works best. SNCC, on the other hand, followed a perception that to empower people from the grassroots to affect change themselves was the best method to pursuing a change in society and ultimately, the laws. Each of these perceptions worked to a varying degree. This thesis shows how each perception worked to change the United States.

Connie G Tang, Biochemistry

Dr. Sung-kun Kim, mentor

Purification and Expression of pfu DNA polymerase in Pyrococcus furiosus

DNA polymerase gene from the hyperthermophilic Archaeon *Pyrococcus furiosus* has undergone bacterial transformation into the *Escherichia coli* strain BL21 (DE3) via a plasmid where it was then cloned and overexpressed for subsequent purification of pfu DNA polymerase. The DNA polymerase, using the heat-stable property of the enzyme and His-tag characteristics, were isolated through Ni⁺ affinity chromatography. Purity of the enzyme was checked with SDS-PAGE gel, and activity was checked through polymerase chain reaction (PCR) using the AT APRI DNA fragment. Since both purity and activity were more than sufficient, optimization of the standard buffer in PCR was then considered.

Ryan Trobee, International Studies

Dr. David Clinton, mentor

Imperial Encounters: Evaluating the Caucasian and First Anglo-Afghan Wars

The mid-nineteenth century was a time of considerable expansion and consolidation into areas in Asia by European powers, including Imperial Russia and Great Britain. The 1839 Anglo-Afghan War, in which British authorities attempted to establish a friendly buffer state, was a disaster and defeat for the occupying authorities. The Russian campaign into the northern Caucasus was successful in ending significant resistance in the region and allowed Russian control of the region. Why, given significant similarities in the two wars, were the outcomes so different? By examining the motivations for war, the character local populations, the conduct of the campaigns, and the resources allocated to carry out the campaigns, factors present themselves which can help explain the results of these wars. Final evaluation reveals that a lack strategic clarity and implementation of necessary resources contributed most to the British defeat, while tactical adaptation and strategic perseverance allowed the Russians to prevail.

Judith Vazquez, Architecture and Studio Art

Professor Michael Sloan, mentor

Visual Creation from Verbal Allegory

The Shield of Aeneas from Book 8 of *The Aeneid* is a description filled with allegory and metaphor. Some critics have proposed that the shield can be recreated using Virgil's writing. Recreating the shield is possible due to the similarities between verbal and visual language. The semantics of both stem from the same rules and can be understood due to universal understandings. The shield also contains iconographic elements that have been visually recreated. If the content of the shield can be recreated, then the shield as a whole can be. The process would entail abstraction, which would help the viewer understand it to be the Shield of Aeneas but would also make it audience specific. Therefore, a Shield of Aeneas can be created, not recreated, through conventional signs and symbols that can be perceived by the intended audience. It is the audience that ultimately decides if it is a fair rendition, gives the description justice, and properly calls it the Shield of Aeneas.

Peter Vednor, Chemistry

Dr. Rizalia Klausmeyer, mentor

Transition Metal-Catalyzed Allylic Alkylations: A Brief Survey Regarding Their Features and Benefits in Synthesis

The field of synthetic organic chemistry often focuses on two fundamental characteristics of product synthesis: regioselectivity and stereoselectivity. The ability to control how and where reagents combine and how the final structure of the product will manifest is crucial when creating complex molecules that demand high specificity. Emerging from the field of organometallic chemistry is a reaction type called transition metal-catalyzed allylic alkylation that provides strong control over these two characteristics of synthesis while also being able to reduce required resources. This study conducted a simple analysis of past studies on this topic and reveals both the power and limitations of this particular reaction type. Using that information, applications regarding the use of allylic alkylations in organic synthesis can be determined and recommendations as to the direction of research on this reaction can be made.

Jennifer Vieira-Katske, Nursing

Dr. Lyn Prater, mentor

Avian Influenza and the Potential Effects on Nursing: A Literature Review

With the continuous rise in the number of human avian influenza cases around the world, nurses need to be prepared for the possibility of an outbreak. To date, there have been 498 confirmed cases of human avian influenza and 294 have died representing a 59% mortality rate. The influenza virus constantly undergoes antigenic shift and drift. Therefore, human-to-human transmission of avian influenza is highly probable. In the United States, nurses serve a crucial role in the delivery of healthcare. More importantly, nurses are usually the first medical professional an ill patient comes in contact with when seeking treatment. At doctor's offices, clinics, and emergency rooms nationwide, a nurse must first assess a patient before treatment can be rendered. Nonetheless, nurses are not prepared by schools, their employers, or state licensing officials for an outbreak of avian influenza. In fact, according to one research article, 44 percent of nurses cannot properly define pandemic influenza. The lack of preparedness puts nurses' health at risk while on the job as well as compromises patient safety and care. From the research analyzed, it is clear that nurses lack education, support, equipment, and protective gear in order to safely care for patients with possible avian influenza. This thesis paper identifies gaps in preparedness for the possibility of a human-to-human avian influenza pandemic.

Michelle Villanueva, International Studies

Dr. Victor Hinojosa, mentor

Consequences of United States Intervention in Latin America

The relationship between the United States and Latin America has always been closely intertwined. At times, this relationship has been strong and supportive while at other times has been full of tension. My thesis will focus on United States intervention in Guatemala and El Salvador during the civil wars that took place in these two countries. The governments of these countries were known to be violating the rights of their citizens yet the United States government continued to give financial and military aid to these governments. I will discuss the extent to which United States intervention contributed to the human rights violations in these countries.

Jeffrey Vitarius, Economics

Dr. Brad Thayer, mentor

Critical Strategy Theory: A proposal

Power Transition Theory (PTT) seeks to explain the calamitous wars that engulf this planet every one hundred years or so. To this end PTT proposes there are certain economic/power dynamics that produce the atmosphere in which these wars take place. However, PTT has not up until now sought to describe the actual event of warfare. This thesis is designed to expand PTT into this previously unexplained area by proposing an adaptation of traditional PTT named Critical Strategy Theory (CST). In summary CST contends that rising powers (e.g. Imperial Germany, Revolutionary France) seek a strategy that will allow them to undermine traditional power dynamics. This thesis begins with a summary of the foundations of traditional PTT in the work of Organski, Rasler, and Thompson. From this foundational background CST is proposed and then applied to both the Imperial German historical case and the Communist Chinese contemporary case.

Valori Waggoner, University Scholar

Dr. Richard Sanker, mentor

Optometrists, Ophthalmologists and LASIK

The LASIK procedure has offered a viable alternative to glasses or contact lenses to many patients. Currently, the LASIK procedure is only performed by ophthalmologists. In this thesis, I will examine the training of optometrists and ophthalmologists, as well as the LASIK procedure itself, to determine whether optometrists could be viably trained to perform safe and successful LASIK procedures.

Andrew Waller, University Scholar

Dr. Lisa Baker, mentor

*A Cross-Sectional Study of C-Reactive Protein as a Marker of Inflammation
in Patients with Untreated Malaria in Rural Western Kenya*

In order to effectively alleviate the crippling morbidity caused by malaria in sub-Saharan Africa, the natural history and nature of the immune response to malaria must be more completely understood. Solid evidence concerning the pattern and level of inflammation over the course of a malaria episode is lacking, as is a clear consensus regarding the optimal level of CRP in the immune response to malaria, the quantifiable effect of malaria on inflammation, and the efficiency of CRP as a predictor of malaria. C-Reactive Protein (CRP), a known indicator of the inflammatory response, is studied in conjunction with other indicators of infection. This cross-sectional study analyzes clinical data collected from a sample population of 685 Luo subjects who attended a clinic in May, 2010 in rural western Kenya. Data trends over time are inferred from data collected from distinct subjects and the subject's self-report. The average CRP level in malaria patients is 31.67 mg/L, which is an average of 27.08 mg/dL higher than non-acute patients ($p < 0.0001$). Average CRP levels decline for malaria patients from 48.62 mg/L at days 1 to 6 of infection to 27.73 mg/L at day 7 ($p = 0.0347$) and to 19.01 mg/L at days 21+ ($p = 0.0008$) of infection; average CRP values for persist at consistently high levels in children aged 0 to 5 years. CRP is found to be a statistically significant predictor of the presence, severity, and duration of illness; temperature is a better indicator for severity when CRP is greater than 40 mg/L and for duration of illness at any CRP level. These results indicate that inflammation begins and remains elevated over the course of malaria infections, indicating prolonged morbidity, especially in those patients 0 to 5 years old.

Tyler Walton, University Scholar

Dr. Sarah Jane Murray, mentor

Roland: A Screenplay

The Song of Roland (Chanson de Roland) is the oldest surviving Old French epic (ca. 1040). The earliest manuscript is that of Oxford Bodleian Library Digby 23, where the Song is prefaced by a twelfth-century copy of Plato's Timaeus in the Latin translation by Calcidius. Like the Myth of Atlantis in the Timaeus, the Song of Roland records the great deeds (Lat. GESTA > O.F. gestes) of the Franks in a pseudo-historical narrative inspired by Einhard's account of the battle of Roncevaux in the Vita Karoli (9th c.). There, the Basques attack Charlemagne's rear guard in the Pyrenees; in the OF Song, the Basques have been replaced by the Saracens, and Roland now gives his life to save France, his King, and Western Christendom, from invasion. In my thesis, I take inspiration from the Vita Karoli and the Song of Roland to craft an epic for our own times. Modeled on the principles of film writing and media wisdom articulated by Robert McKee, Blake Snyder, and Ted Baehr, my pseudo-historical fiction is driven by the central premise that virtue and self-sacrifice triumph over iniquity and self-interest

Danielle Washington, Classics

Dr. Julia Hejduk, mentor

An Epic of Love: Amor and Arma in Ovid's Amores

In his collection of elegiac love poems, the *Amores*, Ovid elegantly and skillfully displays the paradox of love and war which the Augustan poets of his day and their predecessors had wrestled with as Latin elegy developed. For Ovid, all lovers are soldiers who are either conquering or being conquered. The theme of *militia amoris* has the confounding ability either to exploit the life of a lover for jocosity or to elevate love to a level of gravity equal to that of epic or tragedy. Through analyzing the progression of military metaphor in the *Amores*, I argue that Ovid is stepping outside the confines of conventional amatory elegy in order to write what I call "An Epic of Love" that is both serious and humorous. I will show how Ovid's complex use of military imagery in this unique book of love poems reflects the double nature of Amor, which is both *saevus* and *levis*, and the nature of the work as a whole.

Emily Watters, University Scholar

Dr. Baker, mentor

Barriers to Health Care Access: Patients' perceptions, experiences, and values

Hospital Emergency Departments (ED) throughout the world are becoming overcrowded and have become the health care safety net for millions of patients. In the United States, ED usage has risen by 26% over the past three years, and ED visits are replacing primary care. This shift in utilization has created crowding, inefficiency, increased cost, and suboptimal care for non-emergent problems, particularly in the case of chronic illness. This pilot study of ED utilization patterns sought to provide answers as to why people use the ED for primary care concerns instead of going to a primary care physician (PCP). One hundred and sixty patients were interviewed at Baylor University Medical Center (BUMC) ED in Dallas, Texas, and an additional seventeen patients were interviewed at Baylor Medical Center ED in Garland, Texas. Using a series of open-ended questions, data were collected about patients' medical problems, motivation for using the ED, experience with primary care, as well as demographic information. Results show that 50% of the ED patients had health insurance and 51% of the patients had a PCP. However, these patients without insurance and those without primary care are not the same group of people. Thirty-seven percent of uninsured patients had a PCP, and 36% of patients with insurance did not have a PCP. Among those patients who have a PCP, 50% of them said that they came to the ED because they could not get an appointment with their PCP in a timely manner. These results show that access to a PCP is not merely a matter of whether or not people have health insurance. There are many complicated factors that affect a patient's decision to utilize the ED instead of going to a PCP, and innovative solutions will be necessary to manage the cases of non-urgent ED utilization. To begin solving the problem of inappropriate ED utilization, it would be best for patient outcomes and for lower costs to focus on managing ED patients who have non-urgent problems associated with chronic disease.

Rachel Wilkerson, University Scholar

Dr. David Jeffrey, mentor

"Give Beauty Back to God:" Reconstructing Hopkins' Affirmation of Form

poet Gerard Manley Hopkins composed his theory of aesthetic form at the time of the development of thermodynamics. By maintaining a sensitive but critical eye towards cultural developments of the time, Hopkins anticipates modern developments in dynamics. His careful observation of form demonstrates a complex understanding of beauty that resonates with modern, scientific notions of form. By examining contemporary opinions on the forces of order and disorder and their relationship to aesthetics as a whole, Hopkins avoids the response of reactionary Christian perspectives and develops a new understanding of form. His new affirmation of form rightly situates form scientific and aesthetic construct in a wider Christian paradigm.

Kathryn Williams, Political Science

Dr. Sara Stone, mentor

Bias in News Coverage of the May 2010 Flotilla Incident: A Content Analysis of the BBC, Al Jazeera, and the Jerusalem Post

In this thesis I discuss the media's coverage of the May 2010 flotilla raid, specifically, reports from three news publications, the Jerusalem Post, the BBC, and Al Jazeera News, during the week of May 31-June 7, 2010. A sampling of articles from each news organization were selected for a content analysis to determine the presence of bias. The sources were chosen because of their regional ties. The BBC represents the international media, and an outside perspective. Al Jazeera and The Jerusalem Post reflect the regional representation of the Arabs and Israelis, respectively. Moreover, the outlets' predisposition towards one party or another presented a bias. These bias were made apparent in each news outlets' reporting. The bias contributed to the international community's condemning response.

Brandon Wold, Neuroscience

Dr. Bruce E. Hodson, mentor

13-vertex Rhena- and Nickelacarboranes Incorporating the [nido-1,10-C₂B₁₀]²⁻ Ligand

Two novel anionic 13-vertex metallocarborane species incorporating the [nido-1,10-C₂B₁₀]²⁻ ligand have been successfully synthesized, namely [N(PPh₃)₂][4,4,4-(CO)₃-closo-4,1,10-ReC₂B₁₀H₁₂] and [N(PPh₃)₂][4-η³-(C₃H₅)-closo-4,1,10-NiC₂B₁₀H₁₂]. To our knowledge, only three examples of metal complexes incorporating this ligand have been reported in the literature, only one of which is anionic in nature. Whereas the Rhenium species proved resistant to further chemical manipulation, its Nickel relative provided neutral Ni(II) compounds *via* protonation and subsequent removal of the allyl ligand, and completion of the Nickel coordination sphere by neutral cyclic hydrocarbons. In this manner [4-η²:η²-(1,5-cyclooctadiene)-closo-4,1,10-NiC₂B₁₀H₁₂], and [4-η²:η²-(1,3-cyclohexadiene)-closo-4,1,10-NiC₂B₁₀H₁₂] were prepared. All compounds were characterized using Infrared and Nuclear Magnetic Resonance Spectroscopies, and X-ray Crystallographic techniques.

Shannon Wood, Medical Humanities

Dr. Eva Doyle, mentor

Reproductive Health and Contraceptive Use in Rural Kenya: A CBPR Study of Needs and Capacities

Overpopulation is currently a major issue in many parts of the world, especially in sub-Saharan Africa. Unplanned pregnancies create hazardous health and psychosocial ramifications for children, mothers, and society. The most straightforward way to deal with overpopulation is to give women the tools to plan their pregnancies, but this strategy is not a simple one. Women need access to family planning knowledge and to scientific means of birth control, however it is not clear that knowledge and access alone result in fewer unplanned pregnancies. The purpose of this study was to examine these questions in a poverty-stricken, rural setting in western Kenya with traditional cultural values. One hundred and fifty-five women in eight villages on the Nyakach Plateau were interviewed about their knowledge, behavior, and attitudes concerning reproductive health and contraception. The results showed that only 8% of the sample had accurate knowledge of birth control methods and reproduction, in spite of local efforts to promote and make available family planning methods. Even though knowledge was associated with actual use of contraception, neither of these factors were associated with fewer unplanned pregnancies. The most striking finding was that >80% of women in every age group and marital status admitted to having been forced to have sex at some point. This variable of forced sex was the only factor measured that was associated with a higher number of unplanned pregnancies. These findings highlight the complexity of implementing change in sexual and reproductive behavior among men and women in traditional communities with few health and social service resources. Reproductive health education and effective health care delivery systems are necessary, but they must be accompanied by interventions in the social system in which families are enmeshed.

Rachel Zitzman, Great Texts

Dr. William Weaver, mentor

Nature of Female Virtue in Spenser's The Faerie Queene

Some have argued that the only virtue that Spenser allows women to be capable of is that of physical beauty. I maintain that this is incorrect, and argue that Spenser allows female characters the same potential for virtue that he allows the male characters. First, I argue that this can be seen on account of the fact that female's physical beauty does not necessarily imply virtue. Second, I show how male and female characters can exhibit similar vices that result in comparable consequences, and how this demonstrates that Spenser presents the same moral standard for both genders. Finally, I focus on Book Five and study the union of Britomart and Artegall and what it implicates about the ability of Spenser's women to exhibit virtue.

OTHER 2011 HONORS GRADUATES

Zachariah Bingaman, Great Texts and English

Dr. Peter Candler, mentor

Joshua Daniliuc, Electrical and Computer Engineering

Dr. B. Randall Jean, mentor

Shingo Kihira,

Dr. Myeongwoo Lee, mentor

b_{1c} integrin regulated cki-1/p27^{KIP1} localization in nucleoplasm

Victoria Longoria, Health Science Studies

Dr. Darryn Willoughby, mentor

Mariano Mercado, Mechanical Engineering

Dr. Kenneth Van Treuren, mentor

Caroline Northedge, Language and Linguistics

Dr. Clay Butler, mentor

Harry Shen, University Scholar

Dr. Charles Garner, mentor

Angelina Vishnyakova, Anthropology

Dr. Thomas Offit, mentor

David Bond West, University Scholar

Dr. Jeffrey Hamilton, mentor

Gildas: the Ruin of Britain and the Birth of British Historiography

Erum Whyne, Psychology

Dr. Jo-Ann Tsang, mentor