

The UTPB Journal of Undergraduate Research

Established 2018

Volume 3

September 2021

Editors-in-Chief

Dr. Rebecca Babcock (Arts, Humanities, and Social Sciences)

Dr. Mohamed K Zobia (Natural and Physical Sciences)

Associate Editor

Mr. James Coggins (Arts, Humanities, and Social Sciences)

Reviewers for this Volume

Dr. Andrea R. Efthymiou, Hofstra University

Dr. Doug Downs, Montana State University

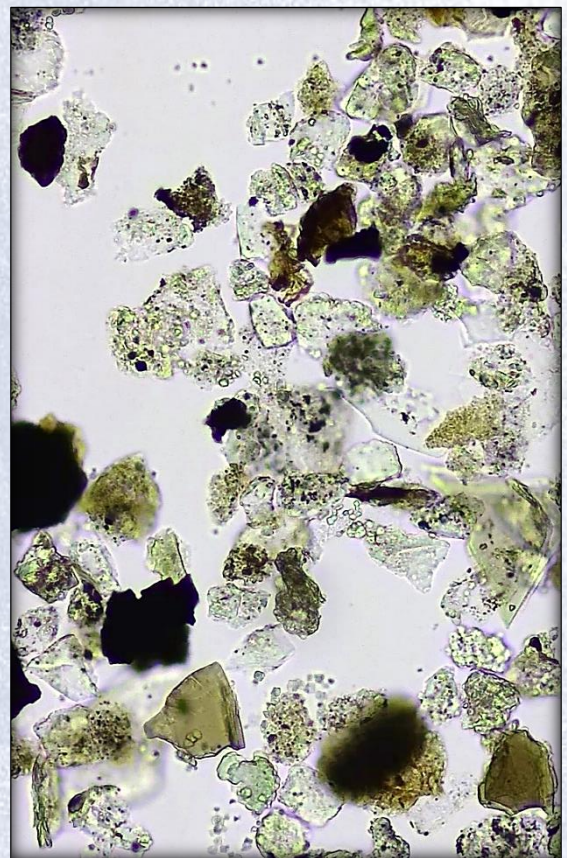
Dr. Myra Salcedo, UT-Permian Basin

Dr. Nichole Rougeau-Vanderford, UT-Permian Basin

Dr. Rachel Harlow, UT-Permian Basin

Ms. Jasmine Tambunga, UT-Permian Basin

Ms. Sheena Stief, UT-Permian Basin



HF-free extracted sedimentary organic matter from the Cretaceous-aged Mancos Formation, San Juan Basin, New Mexico. Courtesy of Samantha James and Mohamed Zobia, Department of Geosciences, UT-Permian Basin.

Benevolent Hypocrisy Versus Christian Agape in Herman Melville's "Bartleby the Scrivener"

Abigail J. Vinson^{1,S,§}, Clark Moreland^{1,M}

1. Department of Language and Literature, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: vinson_a51173@utpb.edu

Abstract

In Herman Melville's "Bartleby the Scrivener," a lawyer is seen making efforts at befriending his quiet and listless employee, Bartleby. All the efforts seem to fall short however, and Bartleby ends up starving himself to death in a prison despite the efforts the lawyer made to give Bartleby a chance to improve his life. The purpose of this paper is to come to a deeper understanding of the motivation behind the actions of the lawyer and whether true love can be conveniently and neatly gauged through measurable results or if it must be given without thought of return. Through exploring the cultural attitudes towards charity at the time the story was written in order to understand the mindset of the lawyer, diving into both the philosophic and pragmatic meanings of charity and philanthropy, as well as doing primary research in the life of Melville to understand whether he was seeking to challenge or embody popular ideals of charity in the 1850s, we will seek to discover how the actions of the lawyer did not express the love he claimed to espouse.

© UTPB Journal of Undergraduate Research, 2021.

Introduction

In Herman Melville's short story "Bartleby the Scrivener," the narrator is a lawyer in need of another scrivener in his office. He hires Bartleby, a taciturn and intensely reticent young man. Bartleby seems to find no pleasure in anything he does. He politely but firmly refuses to do any work that displeases him, and slowly descends into severely diminished productivity until he does absolutely nothing and will not leave the office when fired. When asked to do work or run errands for the lawyer, he simply states, "I would prefer not to" (Melville 115). When offered generous sums of money to quit the office after he has gone blind from working in dim lighting, he says, "At present I would prefer not to make any change at all" (139). Eventually, Bartleby is dragged to prison where the lawyer visits him a few times only to find that Bartleby has starved himself to

death. The lawyer is left with guilt that plagues him as he recounts the entire story.

The lawyer's actions, if they had to be labeled as anything, may by some be called "charitable." Technically, the lawyer does beyond what he would need to professionally, letting Bartleby stay longer than he should have, providing him with financial support that is coldly rejected by Bartleby, and extending favors of hospitality. For all of this however, it appears that the lawyer's actions did not affect Bartleby's outcome, which grieves the lawyer. If the lawyer's actions were truly Christian, as he claims to be, the actions would have been done selflessly, without thought of return. The essence of Christian charity is giving and being content with loss rather than gain. It administers riches freely and does not expect a favor in return. However, what the lawyer gives to Bartleby is out of selfish intention. He

gives not out of his heart but out of his societal sensibilities, not out of a spirit of Christian charity but out of selfish ambition.

The Motivations for Charity

Historically, there are five motivations for charity. Firstly, goodwill for one's fellow man. This is related to humanism, which had a strong place in the canon of philosophy in the 19th century. The belief that man is innately good prompts generous giving out of a good heart that wants to help a destitute man into a better way of life. This is the backbone of the idea of universal brotherhood. Robert Bremmer's book *American Philanthropy* espouses the viewpoint that charity is given out of benevolent motivations (qtd in Friedman 5). This was the prevailing philosophy about charity up until the 1970s.

The second motivation is control. Historians David Rothman and Clifford Griffin propose that philanthropy was not in fact practiced with the good of people as the main intention. Rather, "they found increasing favor with a view that philanthropists sought to control lower-class and deviant populations to augment ruling-class profits and social stability" (qtd in Friedman 5). This is a fascinating perspective in light of the lawyer's actions and attitudes. He says of Bartleby, "He is useful to me" (Melville 118). Perhaps there is an element not of pure love, but also of manipulation in his attitude towards Bartleby.

The third drive towards charity is self-approval. In referencing his own benevolent charity towards his employee, the lawyer says, "Yes. Here I can cheaply purchase a delicious self-approval. To befriend Bartleby, to humor him in his strange willfulness, will cost me little or nothing, while I lay up in my soul what will eventually prove a sweet morsel for my conscience" (Melville 119). The lawyer wants to give to make himself feel good. When Bartleby's lack of reciprocation provokes the lawyer, he becomes clear that the good feelings are not going to come. The lawyer states, after trying to help Bartleby several times, "to a sensitive being, pity is not

seldom pain. And when at last it is perceived that such pity cannot lead to effectual succor, common sense bids the soul rid of it" (Melville 125). When the motivation for charity is to make oneself feel charitable and kind, the giver can be disillusioned as soon as negative feelings enter the scene. Bartleby never thanked the lawyer or granted him the good feelings that the lawyer expected to be reciprocated.

The fourth motivation is social recognition. As Bartleby's behavior worsened, the lawyer became increasingly disturbed by the rumors being circulated about the activity in his office. The lawyer becomes nervous as he is "made aware that all through the circle of my professional acquaintance, a whisper of wonder was running round, having reference to the strange creature I kept at my office. This worried me very much" (Melville 134). When Bartleby becomes a threat to the lawyer's reputation, the lawyer realizes that whatever sort of relationship he has with his defunct employee is not worth more to him than his high standing in society.

The Bible addresses the phenomenon of giving, not only with eyes for the person in need, but also with eyes peering out towards any witnesses of the charity being given. The gospel of Matthew says, "When you give to the needy, sound no trumpet before you, as the hypocrites do in the synagogues and in the streets, that they may be praised by others. Truly I tell you, they have received their reward. But when you give to the needy, do not let your left hand know what your right hand is doing" (Matthew 6:2-3, English Standard Version). The lawyer is claiming to follow at least part of the Christian code of ethics, while simultaneously contradicting it.

The fifth motivation is a combination of all of the above factors. Friedman indicates that "sincere, benevolent intentions and social control in the interests of ruling-class hegemony became increasingly to be viewed by historians [...] as different, shifting, and often competing layers of motivation within most philanthropists" (5). It is very possible for the giver of charity to begin with a virtuous motivation which evolves into something much more sinister along the way. In this story, the lawyer starts off as benevolent and pitying. He progresses through giving because of guilt that his previous

attempts did not affect any change in Bartleby's life, then finishes off with a sizeable dose of animosity towards Bartleby as an object of shame.

Charity: Then and Now

The rise in philanthropy and charity in the United States was institutionalized through the founding of different organizations throughout the 19th century. The Salvation Army was founded in London in 1865 — twelve years after the publication of "Bartleby, the Scrivener" — while the American Red Cross was founded in 1881. Due to these organizations being founded and a rise in awareness of charity, the lawyer may have felt some societal expectations about showing charity. In a society that was ridden with sharp divides, the only option for interacting with people of a lower class was charity. Businessmen would give to show their status, virtue-signaling even while keenly aware of the fact that they were in a higher social stratum than the recipients of their charity. It used to be very popular for royalty to occasionally make a display of blessing the poor masses with some money, whereas royalty now are portrayed as connecting with their subjects person-to-person on an equal level. Society in Melville's time seemed to value the structure and tradition of the strata of social class more than person-to-person equality based on mutual humanity. The lawyer may have felt that for his status as an important member of society that he should also be charitable and giving. The only hole in his selfish plan is this: charity is by nature a selfless act. It should not be participated in as a giver with a sense of selfish gain. Towards the end of the story, it becomes apparent that he deals with Bartleby because of the motivation of two factors: the comments and ruminations of other people as well as his societally given sense of obligation.

In modern day charity, the underlying philosophy seems to have a strong bent towards humanism. Charitable organizations invest in people because they believe in the innate goodness and ability of people. The philosophy of humanism comes from the word *humanitas*, meaning "the development of human virtue,

in all its forms, to its fullest extent" (Grudin). Melville seems to be challenging the idea that man is as innately virtuous as the philosophy of humanism would claim. This story is a case-study of what happens when charity does not affect the desired change. The investments of time, energy, and money proceeding from the lawyer which should have benefitted Bartleby fell flat.

Of the five motivations for charity, the lawyer's is undoubtedly in the fifth category. There is an element of each kind of motivation, and the lawyer's actions and motivations are complicated and twisted. Dan McCall postulates that "charity is a sign of weakness, for the lawyer is too afraid of creating a scene by throwing Bartleby out at the first sign of insubordination — as a stronger character would have done" (105). Perhaps the lawyer getting involved in such a personal relationship with his employee was a lack of fortitude to do what some say should have been done in the first place — namely, refusing to give charity to a person who did not desire it.

Perhaps the scrivener's passive attitude provoked the people-pleasing lawyer as a challenge of sorts and made him determined to win his good opinion. The lawyer was probably used to people approving of his actions, as he was a member of the most accepted social group in this society. In America in the 1850s, white, Christian, heterosexual, city-dwelling businessmen held much power. When Bartleby descended into doing nothing at work except sitting quietly by himself, the lawyer started to wonder to himself if Bartleby was "scandalizing my professional reputation" (Melville 134). The lawyer was highly concerned about the opinions of his colleagues. His references to others' opinions strengthens the argument that the lawyer's actions were seemingly charitable, but in fact were just a way to seek social approval.

Almost the entirety of the story takes place in an office building on Wall Street. It is highlighted that the entire encounter is in an inhuman, unforgiving, and harsh office building rather than a home or a pub or anywhere that has a semblance of humanity and rest. Even the placement of Bartleby's desk in a corner of the office is a symbolic imprisonment, showing "the scrivener's

spiritual isolation" (Fogle 26), until the end of the story which finds Bartleby in a literal prison. Perhaps this sterile, mechanical environment informed the lawyer's interactions with Bartleby. Even when the lawyer discovers Bartleby staying in the office on weekends, it is still in the context of an office building. He ruminates that, "it was the circumstance of being alone in a solitary office, upstairs, of a building entirely unhallowed by humanizing domestic associations" that caused Bartleby's refusal of help (Melville 132). As a final resort, the lawyer offers to bring Bartleby into the humanizing experience of going to his own home, but it is too late. Bartleby is already locked in as a cog in the machine of the office.

The language of Bartleby being useful is fascinating, especially since this story was written in a pivotal time in American history. Jones states that "between 1789 and 1860 the chief occupation of the American people was agriculture, but the beginnings of industrialism came in this period, too" (84). This shift in the economic makeup of America is reflected in the way the lawyer treats Bartleby as a fixture in the system of the Wall-Street office. It seems that Melville is protesting the new-found capitalist mentality that never worked in his favor in his lifetime, since he continually struggled with personal finances. McCall says, "the story is one of the bitterest indictments of American capitalism ever published" (107). Melville has a message to relay about the new direction of the system of employment and labor in America. The system that benefits few and keeps the rest in a new form of mainstream servitude is not one that Melville will give his assent to, and he helps his readers to see the problems that arise from capitalism that trades human labor for money. McCall points out the rebelliousness of Bartleby's actions by saying, "Bartleby is really staging a sit-in, and the narrator responds as the very essence of capitalist society, reducing all human relationships to money relationships" (111-112). However, it could be argued that although not a preferable attitude, it was entirely within the lawyer's right as an employer to do treat Bartleby as he did. From an economic perspective, employing the Bartleby who refused to comply with the smallest request and who did

no work does not make sense. It was the lawyer's attempt at getting involved with Bartleby on a personal level that interrupted the relationship which could have remained strictly professional – nothing more, nothing less.

Charity: Not Just Giving

As part of the fabric of humanity, something within people generally desires good health and prosperity for those around them. Sometimes, this prompts charitable action. Each person, however, seems to have their own standard for what constitutes the correct choices in life. The lawyer as well as the readers of the story are shocked that Bartleby made an autonomous decision that was his to make. It is striking how enraged people find themselves when their charge makes a decision that they themselves would not make. This attitude is demonstrated by Kingsley Widmer's writings on nihilism in "Bartleby the Scrivener:" "How dare those miserable clerks! They insist on the primacy of preference and will, these wan and lonely creatures in their subterranean and impotent lives which end in perversity and self-destruction" (94). This echoes the controlling attitude that the lawyer exhibits towards his employees.

It makes one wonder why the lawyer would keep this pretense of amicability if it keeps being rejected with no reciprocation of interest or action from Bartleby. Why would the lawyer try so hard to be Bartleby's companion when Bartleby, even if he has any good qualities, chooses to remain isolated and frustratingly indifferent? Why would he "waive the biographies of all other scriveners for a few passages in the life of Bartleby," if he is narrating retrospectively and already knows how the story ends (Melville 107)? Furthermore, the relationship between Bartleby and the lawyer, just like all of the relationships in the office, should have been strictly professional, seeing as they were coworkers and not friends. Somehow, it seems to go from a professional relationship into an absolute personal torment to the lawyer, who in trying to sort out what to do about Bartleby, speaks the following musings: "He would do

nothing in the office; why should he stay there? In plain fact, he had now become a millstone to me, not only useless as a necklace, but afflictive to bear" (Melville 128). Using the language of the Bible – "but if anyone causes one of these little ones who believe in Me to stumble, it would be better for him to have a large millstone hung around his neck and to be drowned in the depths of the sea" – the lawyer makes himself the victim, and Bartleby the offending party (Matthew 18:6 BSB Version).

One must wonder though about the innate ability in Bartleby that could have been developed. In his article, "Narrator of 'Bartleby': The Christian-Humanist Acquaintance of John Jacob Astor," Thom as Dilworth states that although Bartleby is financially trustworthy, he seems to have no other real virtues. He is closed off to interpersonal relationships and greets any kind of interaction, any kind of assistance or friendship with cold indifference. On several occasions, the lawyer calls Bartleby his friend but in the lawyer's inner discourses, it is apparent that he does not regard Bartleby as a true friend at all. In presenting the actions of men in a realistic setting such as a lawyer's office, Melville seems to be asking how such lofty ideals of friendship and charity could possibly be lived out by mortals with an imperfect nature. Melville is asking about the exceptions to the philosophy of humanism, such as men who are bent on evil no matter how much persuasion they are greeted with, the men who have never wanted to be successful and will never achieve worldly success, and men who (like Bartleby) will never make positive changes to improve their life, even when offered the chance.

In Anders Nygren's analysis of Martin Luther's musings on love, entitled, *Agape and Eros*, Nygren points out that humans desire a teleological motivation — that is, a motivation that is driven by the end result rather than the cause (737). There is a desire for the lawyer's actions towards the scrivener to have a happy ending, regardless of the lawyer's motivations in giving. Readers may find themselves crying out for a solution, whatever form it may come in! There is a craving for satisfactory finality, which is exactly what Melville refuses to give in this story. As McCall points out, "what if Bartleby is unreachable by

our very best impulses and our most enlightened social arrangements? The deepest question in the story is what you do with Bartleby. The deepest answer the story provides is that you can do nothing" (113). This story is meant to trouble the reader in its haunting portrayal of an unsolvable problem.

As the reader approaches the end of the story and realizes with dismay that Bartleby has died, they logically attempt to find a resolution to the problem of ineffective charity. One of the most frustrating aspects of this story is that one cannot place blame on one character or another. It cannot be said that Bartleby descended lower and lower because the lawyer was cruel. Regardless of the lawyer's attempts, there was no effective communication between the lawyer and Bartleby. There was no connection, no communion of souls that defines real friendship. There was no solution of Bartleby's fate within that relationship because it was not a relationship in the truest sense of the word. It was not a friendship that is characterized by a certain amount of equality, and it also cannot be defined as a charity in which someone is receiving what is given.

Charity has two essential parts: giving and receiving. The actions of the lawyer could be labeled as charity, but since they were never received by Bartleby, it is inaccurate to label it as such. When the lawyer offers to take Bartleby home to avoid his eviction from the office, Bartleby refuses to willingly submit to the treatment that has "repeatedly victimized him" (McCall 104). Although the opportunities are presented to Bartleby, it is as though Bartleby senses the lack of genuine care and refuses to receive what he sees as manipulation. It is impossible to draw a connection between the actions of Bartleby and the so-called charity of the lawyer because the charity the lawyer attempted to give was nullified by Bartleby's continual rejection of it.

The lawyer wants to believe that Bartleby is his friend, but it seems that he keeps imagining it in his head, entirely disconnected from the fact that Bartleby does not desire his friendship! The lawyer acts in order to please himself, demonstrated by his placing Bartleby's desk in a near-by corner, "so as to have this quiet man within easy call, in case any trifling thing was to be done

(Melville 114). This selfishness towards others proceeds out of a selfish nature that is mainly concerned with his own comfort. The lawyer proudly says while introducing himself as the narrator of the story, "I am a man who, from his youth upwards, has been filled with a profound conviction that the easiest way of life is the best" (Melville 107). The lawyer's actions were less genuine charity and more convenience — mentally, spiritually, and physically. He wants to believe that he is friends with Bartleby, but due to his egocentrism, he cannot realize that the attention is unwanted, resulting in a dysfunctional relationship that cannot logically cast blame on anyone's actions.

Although the lawyer gives what he can to the scrivener, Bartleby's needs are never met. Charity should meet the need of the person in need, but the lawyer's form of charity is primarily self-serving. He attempts to meet Bartleby's physical needs at his own convenience, though it is apparent that Bartleby's needs are mental and spiritual rather than merely material. The lawyer fails to identify and provide for his employee's actual needs. As Emery notes, "the narrator can never fully understand or truly befriend Bartleby because the narrator is simply too complacent, both philosophically and morally, to sympathize with human dissatisfaction and despair" (186)

In this story, Melville demonstrates the side-effects of well-intended social reform. In the movement of humanism and transcendentalism, authors invited their audience to look for innate goodness within themselves and within other around them, but in Dark Romanticism, men were seen as incurably bent towards evil. The truth is that at times, humanity refuses to develop as its philanthropist would wish. Perhaps the message of this piece of Dark Romantic literature is that some problems cannot be solved with money, energy, philanthropy, good intentions, or verbal encouragement. Perhaps Melville is suggesting that if charity was to be given, it should be given to those who wish to be helped. An amount of whole-hearted belief in someone else's ability to succeed may propel one man into personal and societal success, while another man, like Bartleby, may seem to absorb the energy of the giver into themselves,

never giving back or returning the favor. For a humanist, the actions of Bartleby are astonishing. They would think, "Here is the encouragement. Why is he getting worse rather than succeeding?" This is indeed a perplexing scenario when all the support in the world neither draws out a man's innate goodness nor changes his outward situation for the better.

The doctrine of predestination runs through this story. It is seen in its most extreme form here, with the message that one man cannot make another do anything if he "would prefer not to" (Melville 116). Perhaps Bartleby represents the inevitable slow march towards death in the life of every human being who has ever lived or will live, and the narrator stands in the place of religion that tries to stand in the way of fate. The lawyer, in trying to work out how to deal with Bartleby, finds "the predestinated purpose of [his] life," (133) which is to help Bartleby. He tries to find meaning for his struggles in religious texts and gradually persuades himself "that these troubles of mine touching the scrivener had been all predestinated from eternity, and Bartleby was billeted upon me for some mysterious purpose of an all-wise Providence, which it was not for a mere mortal like me to fathom" (Melville 133). It seems to be shown that Bartleby's woes were inevitable and unstoppable by human effort.

Agape: The Solution to Hypocritical Charity

The lawyer gets very frustrated at Bartleby, because he discovers Bartleby staying in his office one Sunday morning, and the lawyer is very disturbed by it. He "overcomes" the temptation to throw Bartleby out "simply by recalling the divine injunction: 'A new commandment give I unto you, that ye love one another.' [...] Aside from higher considerations, charity often operates as a vastly wise and prudent principle—a great safeguard to its possessor" (Melville 132) In the lawyer's estimation, charity is a convenient social virtue which keeps the lawyer safe from committing crime, making sure that he does nothing too egregious which

would make him lose good standing with his community. This is interesting, because the comments of the “illiberal minds” (134) around him are the very things that rob him of his pious peace and prompt him to evict Bartleby.

Herman Melville’s portrayal of a businessman attempting to live up to the standard of Christ’s injunction to love one another comes across as a scathing critique of a religious attitude. The lawyer cites the Bible as his reason for magnanimous charity, yet his actions and motivations seem to contradict the spirit of its greatest commandment (Matthew 22:36-40 ESV). Melville himself had some exposure to religious charity in his circle of Unitarian acquaintances; his family friend, Orville Dewey “lamented that clergymen were expected to go to their parishioners and express sympathy with affliction” (qtd in Parker 177). Indeed, Melville embodies “New York Unitarian prudentialness in his respectable narrator” (177). It is entirely possible to use religion as a veil to cover selfish motivations, and Melville exposes the weak and human tendency of giving out of convenience rather than out of love in the story of the scrivener as well as in the lives of his clergymen friends.

The lawyer’s claims and his actions contradict each other. On the one hand, he does what Jesus says to do in Matthew 25 – visit those in prison, feed the hungry, and give to the poor. In one sense, “the narrator fulfills the letter of Christ’s injunction point by point” as he deals with Bartleby (McCall 109). He gives to the perceived physical need by offering Bartleby money and taking him in, thus discharging his responsibility to keep the letter of the law while simultaneously contradicting the essence of the teaching:

The lawyer hardly fulfills the spirit of Christ’s message: his money is carefully doled out; he tries to evict the stranger, offers his home only after betraying him, and then immediately flees from him in the time of his greatest need; it is his demands on the stranger which have made him sick; he visits the stranger in prison only once while he is alive thus leaving him alone for several days before and after his visit, thus leaving him to die entirely alone. (McCall 109)

Is this the essence of Christian love and charity? Is this what Jesus meant when he spoke those words in Matthew 25? It is impossible that this façade of charity is an exemplary model of fulfilling the divine injunction.

The lawyer knows (at least in theory, though not in practicality) that a high and noble form of charity exists but provides a way for men to participate in the high ideal of charity while still preserving an inward stinginess. He proudly counters the necessity of purity as a motivation for Christian charity by saying, “mere self-interest, then, if no better motive can be enlisted, should, especially with high-tempered men, prompt all beings to charity and philanthropy” (Melville 133) This form of charity is cheap, like wearing the best costume-jewelry rings with heaps of ornamentation rather than one small precious stone on a solid gold band. The lawyer participates in cheap, convenient, man-made charity. Anders Nygren says of this motivation that “so far from self-love being a natural ordinance of God in nature, it is a devilish perversion. That which in all things only seeks its own, is thereby closed against God” (740) Melville exposes man’s tendency towards the easy route, rather than the worthy route, but the charity that the lawyer claims to practice and the charity that the Bible speaks of are two distinct entities.

The lawyer’s attitude is not one of love; it is one of logic. It is not one of giving liberally. It is one of carefully counting one’s money and time, eking out charity in tiny increments. The problem here is that the lawyer’s love is human rather than divine. His attitude toward Bartleby is enough to disprove his claim of divine love, as demonstrated by the time he calls Bartleby an “intolerable incubus” (Melville 135) after the lawyer fails to see any return for his investment of time, money, and friendship. The human loves, as C.S. Lewis said are “unworthy to take the place of God by the fact that they cannot even remain themselves and do what they promise to do without God’s help” (166). The lawyer’s love proves to be fickle, and his actions are something of their own unique invention with religious inspiration but no power to carry out agape love.

The lawyer claims that he would have been much more generous “had it not been for the unsolicited and

uncharitable remarks obtruded upon me by my professional friends who visited the rooms. But thus it often is, that the constant friction of illiberal minds wears out at last the best resolves of the more generous” (Melville 134). The quote above shows the epitome of this verse: “For if anyone thinks he is something, when he is nothing, he deceives himself. But let each one test his own work, and then his reason to boast will be in himself alone and not in his neighbor” (Galatians 6:3-54 ESV). The message of Christian love is that a man’s work is tested on its own by God. Unfortunately, the lawyer allowed himself to be judged prematurely, bowing to the opinions of people around him rather than being directed by the source of love.

Whether charity and love are genuine or not cannot always be determined by the reaction of the recipient. Christian love is not measured by its success. Its journey is not always quantifiable and linear. However, this should not put a halt on the expression of agape love. “Is love to cease when it realizes that all its efforts in a particular instance are doomed to failure?” (Nygren 732). Agape’s reward is in giving and in pouring out. Measuring love in quantifiable results goes against the whole concept of divine love. “Christian love is by its very nature a lost love. [It is] poured out upon those who reward it with ingratitude. It is the direct opposite of a rational calculation” (732).

Human love primarily seeks its own benefit. Divine – or agape – love is not selfish. Human love is stingy. Divine love gives freely. Human love is a limited source. The divine love is an unlimited source. The lawyer’s identification with the divine love as his source of charity towards Bartleby is a misnomer. It is a mistake. The divine love is far beyond the measly love that the lawyer attempts to demonstrate. To be fair, one could postulate that the lawyer did not have the resources in place to give divine love. Nygren says that the love a Christian can

give “is only that which he has received from God. Christian love is through and through a Divine work” (734). Agape love must be received in order to be given, and in reading through the story of “Bartleby the Scrivener,” the likelihood that the narrator knew divine love is questionable at best. However, the failure on the part of one man is not an indictment on the rest of humanity. Agape love can be known and experienced, as demonstrated by Lewis and Nygren. Agape is rare and it is hidden, but it is discoverable.

References

- Dilworth, Thomas. “Narrator of ‘Bartleby’: The Christian-Humanist Acquaintance of John Jacob Astor.” 2002, *Papers on Language & Literature*, vol. 38, no. 1, pp. 49-76.
- Emery, Allan. “The Alternatives of Melville’s ‘Bartleby.’” *Nineteenth-Century Fiction*, vol. 31, 1976, pp. 186–187.
- Fogle, Richard Harter, and Herman Melville. *Melville’s Shorter Tales*. 1960. Univ. of Oklahoma Pr.
- Friedman, Lawrence J., and Mark D. McGarvie. *Charity, Philanthropy, and Civility in American History*. 2002. Cambridge Univ. Pr.
- Grudin, Robert. “Humanism.” *Britannica*, <https://www.britannica.com/topic/humanism>. Accessed 7 May 2020.
- Jones, Peter D’A. *An Economic History of the United States Since 1783*. 2006. 1st ed., Routledge, Accessed 14 Apr. 2021.
- Lewis C. S. *The Four Loves*. 1960. Harcourt Brace Jovanovich.
- McCall, Dan. *The Silence of Bartleby*. 1989. Cornell Univ. Pr.
- Melville, Herman. *Billy Budd and Other Tales*. 1998. Signet Classic.
- Nygren, Anders. *Agape and Eros: The Christian Idea of Love*. 1982. Translated by Philip S. Watson, University of Chicago Press.
- Parker, Hershel. *Herman Melville: A Biography*. 2002. Volume 2 (1851-1891), The Johns Hopkins Univ. Pr.
- Widmer, Kingsley. *The Ways of Nihilism: A Study of Herman Melville’s Short Novels*. 1970. California State Colleges.

“Self-Talk” in Constituting Athlete Students’ Confidence as a Communicative Practice

Garret Thornton^{1,S,§}, Sarah Cho^{1,M}

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: thornton_g38373@utpb.edu

Abstract

This study pursues to explain the role of “self-talk” in constituting athlete students’ confidence. Although most collegiate athletes are exposed to criticism, their biggest critique does not come from an exterior perspective but from the interior perspective. Self-talk is a communicative practice for athletes that is internally based and reveals the thoughts of one’s subconscious. Self-talk is a significant factor for an athlete’s success in their sports, but it can also be their greatest downfall. In this study, four collegiate athletes will be surveyed on how their self-talk works when they perform in their respective sports. From this in-depth interview, I determined how an athlete student’s self-talk affects the exterior performance and their mental status. I studied the self-talk of current collegiate athletes since it tells us about the mental process that young adults experience in a highly stressful situation. From this research, I examine how the athletes use self-talk as both verbal and nonverbal communicative practice to encourage themselves.

© UTPB Journal of Undergraduate Research, 2021.

The Effects of Social Media Contents on Young Latinas' Body Image

Alyssa Villegas^{1,S,§}, Sarah Cho^{1,M}

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: floreslopez_a07051@utpb.edu

Abstract

This study aims to figure out how social media content affects teenage Latinas and how they feel about their body. It is common to see teenage girls on social media platforms idolizing photos of thin girls. In this study, the effects of what is being viewed on social media by teenage Latinas was discussed by a focus group interview with four Latina college students that are not older than 20. This helps us understand the way they perceive their body image during their teenage years. The interview aimed to determine how social media platforms have affected their body image while growing into an adult. The discussion of current college students' experiences helps investigate the effects of social media on teenage girls since their stories reflect the multi-facets of how social media affects what they just went through in becoming a woman. From this research, I found how social media content affects teenage Latinas' perspectives on their body image.

© UTPB Journal of Undergraduate Research, 2021.

Political Communication Using Social Media

Hannah Gore^{1,S,§}, Sarah Cho^{1,M}

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: gore_h17266@utpb.edu

Abstract

This study aims to discuss current U.S. political leader's communication using social media. Nowadays, many politicians in the U.S. and worldwide use social media to speak on essential subjects on politics. This study discusses how the communication using social media works compared to when the political leaders spoke formally on the traditional media such as the television. For example, it would be very different for the U.S. President if he communicates with people by giving more public speeches on traditional media instead of posting on Twitter or Instagram mostly, especially when dealing with important political issues. For this research, the tones of news coverages on former U.S. President's Twitter postings were compared to his speeches on TV on a similar issue. It would be meaningful to look back at the latest President's communication practices and media's reaction since it will tell us about the future of U.S. politics. From this research, I found out the features of social media as a means of political communication in the U.S.

© *UTPB Journal of Undergraduate Research, 2021.*

Young Adults' News Consumption on Twitter

Lorena Acosta^{1,S,§}, Sarah Cho^{1,M}

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: acosta_l69332@utpb.edu

Abstract

The study attempts to find the role Twitter plays in the way young users consume breaking news. As the social media site has exponentially grown leading young adult users use it as a digital newspaper to receive the latest news. However, the news brought to users comes in a glimpse format with few details. Therefore, concerns of how those summarized versions of news lead to misunderstandings among its young users. For this study I conducted an in-depth interview with five college students who primarily acquired news from Twitter. Specifically, it asked about the pattern of their news consumption including the detailed information when it came to important issues. This study helps find how the current younger generations news consuming culture acquires information.

© *UTPB Journal of Undergraduate Research, 2021.*

“Continue?”: Video Games As Communicative Practices

Easaih Olivas^{1,S,§}, Sarah Cho^{1,M}

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: olivas_e68378@utpb.edu

Abstract

This study aims to explain video games' incentivizing communication with its players to continue the playtime. Many people play video games only a few hours until they seemingly drop the game for no particular reason other than it “not being for them.” It seems that gamers don't finish video games, which begs why these games fail to incentivize the players to play to completion. For this study, two video games and their communication style were compared by finding the incentivization pattern. This study also surveyed a variety of players within the UTPB community to learn about their experiences of incentivizing communication within games. Here, incentivizing theory was applied to explain how video games successfully communicate with the players to continue to play or fail. This study is meaningful to understand the human-game interaction by looking at its communication patterns. From this research, I found better methods to hold an average gamer's attention when playing games and dissuade the use of more predatory incentives in video games.

© UTPB Journal of Undergraduate Research, 2021.

Campaign Strategies: Comparative Perspectives on Obama and Trump's Communication

Malik Brikat^{1,S,§}, Sarah Cho^{1,M},

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: brikat_m47650@utpb.edu

Abstract

This poster discusses the changes in the communicative strategies of using social media over time in political communication. Specifically, it looks into Trump and Obama's communication strategies and how their perspectives have changed from the election campaign and governing. The poster aims to explain the shifts by proposing "the six key communication systems": 1) social media use, 2) creating a brand, 3) public morale, 4) being autonomous when conveying messages, 5) focus on personality, and 6) way of talking. This poster tries to figure out the connection among the systems and compare Trump's communication strategies to Obama's. From this research, it was found that Obama and Trump's communication methods were very similar when campaigning and after the election. Investigating the similarity between Obama and Trump shows how social media has evolved the style of communication in elections.

© UTPB Journal of Undergraduate Research, 2021.

The Meaning of Confederate Flag and Statues

Dalton Farmer^{1,S,§}, Sarah Cho^{1,M}

1. Department of Communication, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: farmer_d92068@utpb.edu

Abstract

National symbols are recognized as a powerful source of political power and the representation of support for state interests. However, we have struggled to deal with the racist aspects of several symbols of the US, including the Confederate flag and the statues of some historical figures. In this research, I discuss the meaning of national symbols and define what they would represent today in the US. For this research, I analyzed a list of academic studies and media contents to determine their definitions of the symbols. In sum, I found out the national symbolism within the flag and statues would work as an excellent means to strengthen ingroup identification. They also evoke the people's emotional expressions of national identity and self-sacrifice. Here I claim that if we get rid of all the "good" and "bad" of our country's history, we never know what we have or what made us.

© *UTPB Journal of Undergraduate Research, 2021.*

Implementation of an Experimental DC-DC Buck Converter on Power Hardware-in-the-Loop (PHIL) Test Bench

Nikita Naumov^{1,S,§}, Jaqueline Obreque^{1,S,§}, Omar A. Beg^{1,M}

1. Department of Electrical Engineering, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: obreque_j04003@utpb.edu

Abstract

With the growing popularity of renewable energy, demand for a more efficient and productive solar panel has grown drastically. By implementing a Maximum Power Point Tracking (MPPT) technique on a DC-DC Power Converter, the efficiency of a solar panel can be significantly improved. The development of these MPPT techniques has been streamlined by modeling them on a simulator. Using a simulator allows for a wider range of testing capabilities and provides a cheaper, safer, and more time-efficient option to develop and improve fast and accurate MPPT techniques. Implementing a model of a buck-converter on the Opal-RT simulator allows for the observation of the behavior of different MPPT techniques. This will provide a better understanding of how to improve them. This work shows the implementation of physical buck-converter on an Opal-RT test bench, the simulation of different MPPT techniques, and their behavior in real time.

© UTPB Journal of Undergraduate Research, 2021.

Encapsulation of Corrosion Inhibitors to Increase Efficiency and Targeted Exposure

Emmanuel Fujah^{1,S,§}, Narendra Boppana^{1,M}, Sepehr Arbabi^{1,M}

1. Department of Chemical Engineering, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: fujah_e09265@utpb.edu

Abstract

Corrosion poses a significant problem in many industrial systems, especially in the oil and gas industry. The consequences of corrosion in oil and gas industry are equipment failure, loss of production, and expensive maintenance costs. The organic film forming inhibitors like imidazolines, dodecyl benzene sulfonic acids, benzylcoco alkyldimethyl chloride, dimer-trimer acids, phosphate esters, etc. are among the common class of corrosion inhibitors used in the oil and gas industry to prevent corrosion. This study is formed around three goals; 1) Setting up an appropriate monitoring method for which the Linear Polarization Resistance (LPR) method is selected, 2) Studying the efficiency of most commonly used corrosion inhibitors like imidazolines and benzylcoco alkyldimethyl chloride under different temperatures in the presence of carbon dioxide gas on C1010 alloy in a 60k brine, and 3) Encapsulating the corrosion inhibitors used in goal 2 and then testing the efficiency and targeted delivery of newly formulated chemicals by using LPR. We report results on all three goals of this study.

© UTPB Journal of Undergraduate Research, 2021.

Flaring of Gasses: Definition, Problems, and Solutions

Ubadire Onyemaobi^{1,S,§}, Sepehr Arbabi^{1,M}

1. Department of Chemical Engineering, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: onyemaobi_u24890@utpb.edu

Abstract

The flaring of gasses has been a major contributor to the rising concentration level of CO₂ in the atmosphere, currently at about 400 Mt CO₂ per year, because of more than 150-billion-meter cube of natural gas being flared every year. This amount of gas released every year is harmful in various forms: (1) Gasses flared are harmful to the health of humans especially NO_x and CO which can cause difficulties in breathing (2) Flared gasses containing H₂S and SO₂ are one of the major causes of acid rain (3) Flared gasses are one of the major causes of the depletion of the ozone layer, which is the main reason for global warming. In this study, we present the current understanding on the size of the problem based on data and show projections on its future severity. The reasons behind gas flaring will be discussed on local and global scales in different industries. The proposed solution landscape along with current state of their application will also be presented.

© UTPB Journal of Undergraduate Research, 2021.

Single Loop Helium Gas Turbines for Generation Four Very High Temperature Reactors (VHTR's)

Dylan D. Ohrt^{1,S,§}, Harishchandra Aryal^{1,M},

1. Department of Mechanical Engineering, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: ohrt_d61726@utpb.edu

Abstract

This is a compatibility study of Very High Temperature Reactors (VHTRs) operating on a single loop gas turbine, and why they should be used instead of other reactor designs. The VHTR design alone has a number of benefits, such as higher outlet coolant temperatures. However, the VHTR with a single loop helium gas turbine is what should be the future of nuclear power. The single loop helium gas turbine would dramatically decrease the cost of new reactor installations. One of the methods is through significantly smaller cooling towers or none at all. The other would be utilizing one single loop and one singular turbine that would also allow for dramatic decrease in cost compared to a typical reactor that will have multiple loops, turbines, and very large cooling towers. The thermal efficiency of a helium gas turbine is also significantly higher than any standard reactor pressurized water reactors in use today. This study aims to prove why VHTRs out class other reactor designs, and why they should be the new standard for nuclear power going forward.

© UTPB Journal of Undergraduate Research, 2021.

Substitution Based of Zinc, Manganese, and Cobalt on Spin Based Thermoelectric of Molecular Formula Co_3O_4

Davisin Lopez^{1,S,§}, Anveeksh Koneru^{1,M}

1. Department of Mechanical Engineering, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: lopez_d91522@utpb.edu

Abstract

Large amounts of energy from different types of industries are generated as waste heat energy. To take advantage of this loss, thermoelectrics are utilized to convert waste heat to useful energy in the form of electricity. Unfortunately, the efficiency of thermoelectrics is low in current implementations of real time applications. The goal of this research is to find the best molecular structure by substituting portions of Cobalt from the molecular formula Co_3O_4 with Manganese and Zinc, and the addition of a spin based by the application of magnetization. The change of parameters is needed to increase the thermoelectric figure of merit (ZT) so the efficiency of spin based thermoelectrics can be higher when compared to current thermoelectric technology. The performance of thermoelectric materials is calculated by thermoelectric figure of merit, ZT, which is expressed as $(S^2\sigma T)/(K_e + K_p)$. S, σ , T, K_e , and K_p are the Seebeck coefficient, electrical conductivity, absolute temperature, thermal conductivity due to electrons, and thermal conductivity due to phonons respectively. To increase ZT, the product $(S^2\sigma)$ should be maximized while reducing K_e , and K_p . In any material, electrical conductivity (σ) and thermal conductivity ($K_e + K_p$) are directly proportional and hence increasing one parameter results in decreasing the other. This makes it very difficult to tune optimal thermoelectric materials. To apply a spin, a material needs induced magnetization which can be attained with the help of a metallic magnet or a transition metal cation that induces a spin and thus resulting in spin-up and spin-down conduction of electrons with different Seebeck coefficients in an alloy. Using substitutions in pure Cobalt oxide, represented with the molecular formula Co_3O_4 , the change in the fundamental properties like band structure, energy band gap, effective mass of conduction electrons can be calculated using the program called Quantum Espresso. In the initial results, a decreasing band gap pattern was observed with the use of Zinc and manganese. Further testing will identify the effect on spin-polarization and the total energy with Manganese and Zinc substitutions into Co_3O_4 .

Peer Influence on African American Males in Career Selection

Christine Ahlhorn^{1,S,§}, Jamie Hughes^{1,M}

1. Department of Psychology, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: ahlhorn_c32701@utpb.edu

Abstract

This study examined racial norms' influence on African American males' career decisions, particularly entrance into trade schools. Two hundred people of average age 22 years old ($SD = 2.16$) were surveyed. Out of those two-hundred people, 100 were African American and 100 were Caucasian. While males were the initial desired demographic of our study, but we also recruited females (52 Caucasian and 50 African American women). Of the participants 62% had completed some college and 103 were still enrolled in school. Of those in school, 91% were in college or some sort of university, while 9% were in trade school. In relation to employment, 36.6% participants worked full-time, 35.6% were employed part time, and 42% were not currently employed. After high school, African Americans sought employment at a higher rate. When studying internalized racism, we found that Caucasians expressed more negative views about their own people than African Americans. In relation to trade schools and college, it was found that Caucasian men were interested in trade school while both African American and Caucasian women were interested in college. Lastly, African American women were more interested in gaining immediate employment after graduation than Caucasian women. While college for many students is presented as the standard second step, many overlook the second option that is trade school. As trade schools become another viable option for those of low-income families, little data exists on minority attitudes towards them, particularly the attitudes of African American males. Peers, parents, and counselors inevitably influence career decisions, and this study may shed light on diversity in trade schools.

© UTPB Journal of Undergraduate Research, 2021.

Knowledge and Attitudes of Mental Health Professionals Towards the Use of Psilocybin as a Therapeutic Intervention

Christin M. McLain^{1,S,§}, Maria Avalos^{1,M}

1. Counseling Program, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: mclain_c08146@utpb.edu

Abstract

Psilocybin is a hallucinogenic compound found in various species of mushrooms that works as an agonist for 5-HT_{2A}. Simply put, it is the psychedelic alkaloid found in what is better known as “magic mushrooms”. Psychedelic studies of the 50's and 60's were initially laid to rest with the Controlled Substance Act, but recently, there has been a resurgence of research on Psilocybin. Current research includes studies at Johns Hopkins Psychedelic Research Center where work has been conducted on the use of psilocybin-integrated methods to treat cancer patients who suffer from depression and end-of-life anxiety; at the newly established Psychedelic Research Center at The University of California, Berkley; and through the work of Robert Carhartt-Harris at Imperial College London, who suggests that Psilocybin could be used as therapeutic intervention for those with treatment-resistant depression and other intractable mental health diagnoses. The present study was designed to establish a baseline understanding of awareness and attitudes of mental health professionals in the Permian Basin area toward the use of psilocybin via survey, while identifying what precautions and possible further direction should be taken within the realm of psychedelic research.

© UTPB Journal of Undergraduate Research, 2021.

Historical and Contemporary Practices in Ceramic studies

Caitlin Bewley^{1,S,§}, Chris Stanley^{1,M}, Alissa Adams^{1,M}

1. Department of Arts, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: bewley_c44952@utpb.edu

Abstract

Throughout my research, I pursued the representation of the human form in ceramics by looking in the Greek Historical context. I used modern-day methods by mixing and throwing clay on the pottery wheel while incorporating similar shapes and stylistic paint qualities to depict the figure. By using this method along with painting narrative scenes, I incorporated the storytelling element that the Greeks used. Through the exploration of my original timeline which was 1000 B.C to 425 B.C., I learned that the evolution of pottery and representation of the human form evolved more quickly than I had originally assumed. I learned that this time frame was too broad, and I needed to narrow it down. I found the timeline of 425 B.C. to 300 B.C. to be interesting and used this as my primary focus. I particularly became interested in the amphora that is a storage vessel for liquids. From my research of this period, I created a similar, modern-day amphora. The adjustments have also been present in the studio as I have experimented with different types of clay stages and how they respond to different types of pottery. Much of my research at this point has come from books and time spent in the studio. My conclusion to this specific research is vessel-based that depicts narrative scenes on pottery, similar to what the ancient Greeks used. This incorporates ancient techniques combined with modern approaches.

© UTPB Journal of Undergraduate Research, 2021.

Research into 15th Century Asian Woodblock Techniques

Jon-Phillip Rogers^{1,S,§}, Mario Kiran^{1,M}

1. Department of Arts, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: rogers_j04186@utpb.edu

Abstract

My research is in relief/woodblock in Asia during the 15th century. I researched the imagery, tools, techniques, and materials that were used during this time. In my research, I used woodblock for my materials. First, I created an image and transferred it on the woodblock. Second, I began to carve into the woodblock. To cut into the woodblock I used woodblock carving tools. After I was done cutting, I then put ink on the woodblock evenly and got butcher paper and placed it onto the woodblock. I then printed the woodblock to proof my image using baren. Once I got what I liked, I then put more ink on the woodblock and printed the image onto quality paper multiple times to get editions of the image. During my research into woodblock, I discovered that relief/woodblock was used to communicate the laws and prayers to the public and for art during the 15th century. The amount of detail that these artists could get on the blocks with their tools helped me understand, that with time, I can only get better. The tools for this type of art are the woodcarving tools. While using these tools it has allowed me to understand that you will need patience when working with the tools and blocks as one simple mistake can ruin the image. While working on my blocks and my research I discovered how they would register their blocks which they did by carving in their registration into their blocks. I also did this, and it allowed me to know exactly where my paper was going to line up. For the imagery many of the artists used people, animals, landscapes, or fantasy/myths, and folklore in their artwork. By learning how woodblock was used and completed it allowed me the ability to try new things in my own artwork.

© UTPB Journal of Undergraduate Research, 2021.

History of Screen Print and Fabric

Michael Aguilar^{1,S,§}, Mario Kiran^{1,M}

1. Department of Arts, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: aguilar_m61362@utpb.edu

Abstract

Screen printing got its start in China's fashion industry to create stencils for embroidery on clothing. Later, with the use of ink modifiers (changing ink opacity) and UV light to create the stencil it was adapted to print wallpaper and curtains in mass production. Screen printing in its simplest form is a type of stencil making. Using a photo sensitive material called emulsion one can "expose" parts of a screen to create a stencil, while blocking out other areas to accept ink. Changing the opacity of a "red", for example, can be printed on top of yellow or blue to mix an orange or purple. After completing my research, I learned how to, not only transfer designs onto fabric to make custom curtains, but also create a pattern that is conducive to repetition. I am also able to now print on other fabrics as the process is the same for custom shirts, jackets etc. After much trial and error my screen-printing abilities have improved greatly. As the result of my research, I learned how to not only create and transfer an image to fabric, but I also learned how to correct any mistakes that may occur throughout the printing process.

© UTPB Journal of Undergraduate Research, 2021.

Comparison of Total Dissolved Solids (TDS) Contamination in Midland and Odessa, West Texas

Michael Valencia^{1,S,§}, Joonghyeok Heo^{1,M},

1. Department of Geosciences, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: valencia_m04625@utpb.edu

Abstract

This study evaluates the public groundwater qualities with environmental changes in the cities of Midland and Odessa, West Texas. Even though both cities are geographically close, each city gets its source of public water from different water sources. Coupled with the U.S government's open data, Texas Water Development Board (TWDB), and Texas Natural Resources Information Systems (TNRIS), these analyses could help identify where environmental changes may have affected groundwater quality. For this study, spatial distribution maps were created for Total Dissolved Solids (TDS), and both cities drinking water reports from 2007 to 2017 were used. The results for each contamination per city were compared and contrasted with the Environmental Protective Agency (EPA) standards. Also, this study proposed potential origins of pollutants, as well as possible risks to human health. Finally, conclusions about the quality of water for human consumption and possible reasons behind the difference of results between the two cities were made. Therefore, this research provides important information for groundwater managements in developing plans for the use of water resources in the future for both cities.

Xylene-Based Extraction Technique of Kerogen from Sedimentary Rocks

Samantha Y. James^{1,S,§}, Mohamed K. Zobaa^{2,F,M}, Chao Dong^{1,F,M}

1. Department of Chemistry, UT-Permian Basin

2. Department of Geosciences, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: james_s06312@utpb.edu

Abstract

Concentrated hydrofluoric acid (HF) is conventionally used to break down the silicate fraction of sedimentary rock samples in order to extract their kerogen contents. HF is a severely dangerous acid that requires special equipment and extreme caution to be used safely within the laboratory. Many people have lost their lives, or at least parts of their bodies, due to inadequate handling of this acid. At minimum, minor topical exposure to HF can result in severe burns, tissue damage, and other forms of serious, chronic injuries. In addition to this, digestion of sedimentary rock samples with HF is both hazardous to the environment and time consuming, which negatively affects laboratory output and productivity. To find a safer, environmentally friendly, and time-efficient alternative, we tried combinations of pulverization, and xylene refluxation techniques. Results of this trial are herein demonstrated.

© UTPB Journal of Undergraduate Research, 2021.

Second Language Acquisition Process of English Language Learners

Fabby C. Torres^{1,S,§}, Tomas Espinosa^{1,M}

1. College of Education, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: torres_f83992@utpb.edu

Abstract

Second language acquisition is the process by which people learn a second language. Stephen Krashen is widely known for his theory of second language acquisition, which has had a large impact in all areas of second language research and teaching. The theory of second language acquisition consists of five main hypotheses: the Acquisition-Learning hypothesis, the Monitor hypothesis, the Input hypothesis, the Affective Filter hypothesis, and the Natural Order hypothesis. In this study, the researchers have interviewed six participants to understand their language acquisition process and learning experience of English Language Learners using Krashen's second language acquisition theory. Due to the non-experimental nature of the study, no causal inferences were drawn. Also, the data collected was organized in themes and analyzed using the constant comparative method or unitizing approach. Results from this study were organized in five themes or categories that include: Benefits of learning a new language, challenges of learning a new language, English proficiencies, attitudes towards language and culture, and resources for English Language Learners. Results from this study also yielded pedagogical implications and directed future research considerations.

© UTPB Journal of Undergraduate Research, 2021.

Bactericidal Effectiveness of TiO₂ and ZnO Nanoparticles Embedded in Acrylate-based Photopolymer Resin

Fernando Montalvillo^{1,S,§}, Athenia Oldham^{1,M}, Chao Dong^{2,M}

1. Department of Biology, UT-Permian Basin

2. Department of Chemistry, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: montalvilloor_f84123@utpb.edu

Abstract

This research project attempted to determine whether TiO₂ and ZnO embedded in resin have antimicrobial properties. Titanium (IV) oxide and Zinc oxide nanoparticles embedded in resin have already been proven to photocatalytic degrade organic pollutants. This is due to the nanoparticle catalysis of Reactive Oxygen Species (ROS) such as OH· or O₂·. ROS are very reactive, meaning they can easily dismantle other molecules. For instance, our immune system uses ROS to combat pathogens. Phagocytic leukocytes use them to kill the pathogen after being ingested by the white blood cells. However, it has not been proven yet if the activated resin can kill microorganisms. Thus, we hypothesize that ZnO and TiO₂ photocatalytic paints are antimicrobial. Before the antimicrobial properties could be tested, the plates had to be made from scratch and characterized. In order to do that, instruments such as the UV-Crosslinker, the Scanning Electron Microscope (SEM) - Energy Dispersive X-Ray Analysis (EDS), and the Rotary Magnetron Sputtering Coating Machine were used. After that, the antimicrobial property studies followed. For this, the Colony Forming Units (CFU) procedure was used to account for the death of the bacteria. The applications that this photocatalytic paint could have are many, but the most intuitive is the production of fresh water. These photocatalytic paints would provide a relatively inexpensive and cost-effective method of cleaning water for consumption or use in industrial processes. And unlike other methods, it will not require an input of energy. Results of this project will be presented herein.

Ammonia Borane Synthesis from Sodium Borohydride and Ammonium Salt: Developing a New Teaching Laboratory Experiment

Nayeli Rosas^{1,S,§}, Theppawut Ayudhya^{1,M}

1. Department of Chemistry, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: rosas_n88091@utpb.edu

Abstract

The purpose of this research is to design a synthetic procedure of ammonia borane that can be done within three hours to allow students in the organic chemistry laboratory classes to complete the experiment in one laboratory session. Sodium borohydride (NaBH_4) ammonium salts were reacted in a 1:1 ratio. The two solids were suspended in tetrahydrofuran. Nuclear magnetic resonance (NMR) spectroscopy was used to identify the purity of the product.

© UTPB Journal of Undergraduate Research, 2021.

Zinc Oxide Nanotechnology in the Production of Agricultural Provisions

Mikayla Rodriguez^{1,S,§}, Milka Montes^{1,M}

1. Department of Chemistry, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: rodriguez_m91451@utpb.edu

Abstract

Modern science and technology have encountered an innovative and thrilling area of interest revolving the manipulation and use of molecules at a nanoscale level; this original concept known as Nanotechnology. Nanoparticles (NPs), tiny in size have immense potential in their innumerable applications. In agriculture, nanoparticles have been found useful in functioning as nanocarriers that help deliver nutrients essential to plant growth and production. This research project aims to evaluate the passage of zinc and silicon oxide (ZnO and SiO₂) nanoparticles at several concentrations, and to assess their role in the growth/development of multiple *Oscium basilicum L.* (commonly known as Basil) plant species. The nanoparticle application will be accomplished through two methodologies- application of NPs to soil fertilizer, and a NP foliar spray. Subsequent to the application of ZnO and SiO₂ NPs, the basil plants will be assessed for various aroma constituents as well plant quality. The preliminary data suggest that the use of SiO₂ NPs in addition to a heavy metal such as zinc, will provide increased plant strength, mass, and aroma constituent properties in comparison to those not treated with NPs. In this research project, we aspire to establish an appropriate zinc and silicon oxide nanoparticle concentration that can help facilitate plants' growth without causing toxicity to the plant. Research of nanotechnology applications in agriculture is particularly significant to the sustainment of human life worldwide, especially in poverty-ridden parts of the world where food is scarce or unavailable. Additionally, nanotechnology applications in agriculture have immense potential to increase crops' production and nutritional content while decreasing biowaste production--an ongoing Environmental concern.

© UTPB Journal of Undergraduate Research, 2021.

Synthesis of Diketone for Xanthine Oxidase Inhibitor

Jonathan G. Muniz^{1,S,§}, Chao Dong^{1,M}

1. Department of Chemistry, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: muniz_j61104@utpb.edu

Abstract

Gout is a common form of inflammatory disease that is very painful and is formed by a condition known as hyperuricemia, where there is too much uric acid in the body: roughly 8.3 million American people have been affected by gout. Xanthine Oxidase Inhibitors (XOI) have been proven to work effectively and are small molecule drugs primarily used to reduce urate levels and act as a preventative. The purpose of this research is to synthesize a diketone compound using the Stetter reaction where a 5-(2-hydroxyethyl)-3,4-dimethyl-1,3 thiazolium iodide salt acts as a catalyst, which will be attacked by a base to form a carbocation on the salt to be a point of anchorage for an aldehyde. From there the Mannich base will react with the intermediate and result in a 1,4-addition forming a diketone. This is stage two out of a three-step process where the last phase will be to use Paal-Knorr synthesis to create three possible Xanthine Inhibitors. The suspected Diketone that is synthesized will be characterized by multiple chemistry techniques such as FTIR, computational methods, NMR, and TLC to ensure the correct compound was achieved. Future expansions such as new general procedures will also be explored to see if the results align with each other and to determine more efficient ways.

© UTPB Journal of Undergraduate Research, 2021.

Programming an Automatic Speech Recognition Device for Use in Academia to Promote Aptitude in Technological Development

Jose P. Barragan^{1,S,§}, Ilhyun Lee^{1,M}

1. Department of Computer Science, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: barragan_j32206@utpb.edu

Abstract

The ability to interpret sounds and deliver a comprehensive response is a relatively simple task for humans despite the complexity of human language. Due to the technological sophistication of today, it is possible to teach this ability to computers. This process is known as natural language understanding. It consists of comprehending the meaning and context of spoken words for an accurate interpretation. In this work, I aim to promote the development of applications for personal assistant devices that use advanced natural language understanding such as the Amazon Echo. I present a defined explanation of the computational processes and the functionality of Alexa-enabled devices. By using Amazon's developer platform, I developed an application to experience the complexity and practicality of virtual assistants. The "skill" as referred to by Amazon, is designed for students at the UT Permian Basin institution to have the ability of asking a variety of commonly asked questions. Through this study, it becomes clear that we are rapidly developing technologies that are potentially revolutionary in the upcoming decades. However, we must promote computer science related careers to young generations in order to meet the demand of the industry and to increase the growth rate of innovative technologies.

© UTPB Journal of Undergraduate Research, 2021.

Design of a Center-of-Gravity Computer Mouse

Kandus Box^{1,S,§}, Douglas Young^{1,M}

1. Department of Math and Physics, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: box_k09736@utpb.edu

Abstract

The purpose of this project is to develop a device that would move a computer mouse cursor based on someone's weight distribution in a chair. The project uses load-cells connected to an Arduino to measure changes in weight distribution. We planned on combining the load-cell sensors with an already developed python program that moves the mouse cursor based on data sent into the computer by the Arduino. Our experiments showed that load-cells do not work for what we are trying to do because they take a significant amount of time ramping up to the final force value and drift (lose track of what zero force is). In our application, this drift would be difficult to correct. Moving forward, we will use resistive force sensors made of a material whose resistance changes when a force is applied. With that, we will be able to test the resistor's response to pressure and further collect data.

© UTPB Journal of Undergraduate Research, 2021.

Improvement of a Capacitive Deionizer

Garrett Martin^{1,S,§}, Douglas Young^{1,M}

1. Department of Math and Physics, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: martin_g75505@utpb.edu

Abstract

Capacitive Deionization (CDI) is a method of desalinization of water using a low-voltage capacitor to separate salt ions in a salt-water solution flowing between the plates of the capacitor. To determine the level of desalinization, the conductance of the solution flowing between the plates is measured. We have used both a commercial and a homemade conductance sensor and have found that they corroborate each other's results. However, due to the limitations of the homemade sensor, we opted to use the commercial meter which we believe is more accurate over a wider range of conductance values. Using the commercial meter, we have found a 14% drop in salt concentration in a 667mg/L solution flowing through our homemade CDI tank. Our current CDI tank only processes small amounts of water over time and also has substantial leaks. A new CDI tank is being designed that will process more water and be less likely to leak. Using this new tank, we will be better able to examine the role of plate spacing and filler material in CDI desalinization.

© UTPB Journal of Undergraduate Research, 2021.

Single-Station Satellite Orbit Determination Using Radio Frequencies Aided by TLE and Bisectional Optimization

Phillip Driscoll^{1,S,§}, Douglas Young^{1,M}

1. Department of Math and Physics, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: driscoll_p06145@utpb.edu

Abstract

The ability to track man-made satellites is a necessity due to the valuable data they provide. The goal of this project is to create a base station with an antenna to communicate with and generate satellite orbit determinations (OD) of satellites that operate on radio frequencies (RF) based on randomly generated bisections. A two-line element set (TLE) fed into a simplified general perturbation model (SGP) will provide a starting position for the station. The system then makes use of several bisections generated by a random fifty-fifty number to ascertain the orbit determination of the satellite based on signal strength. The hope of this project is to generate results accurate to within 1% of the actual orbit determination of the satellites. This would prove the efficiency of the use of optimized bisections within tracking systems due to the limited time to track and fast-moving nature of satellites. The software for this project has been written and tested using an ultrasonic sensor coupled with an Arduino. Construction of the base with antennae is currently in progress.

© UTPB Journal of Undergraduate Research, 2021.

Pre/Post-Natal Depression: Benevolent Sexist Attitudes, Maternal Beliefs, and the Impact on Modern Day Motherhood

Kylie McRae^{1,S,§}, Jamie Hughes^{2,M}

1. College of Health Sciences and Human Performance, UT-Permian Basin

2. Department of Psychology, UT-Permian Basin

S. Undergraduate student researcher

M. Faculty mentor

§. Corresponding Author. Email: mcrae_k32269@utpb.edu

Abstract

The purpose of this research is to better understand what relates to help-seeking behavior for pre/post-natal depression. We have recruited women who were pregnant within the last 3 years. We have three main hypotheses. We predicted mothering attitudes should be related to post or perinatal depression. Further, we believed that benevolent stereotypes about women increase the rates of post or perinatal depression. We also predicted that perceptions of OBGYN warmth or compassion increase help-seeking behavior. To test these hypotheses, we first administered the Edinburgh postnatal depression scale and the mothering scale to explore attitudes. Then, we used the ambivalent sexism scale to assess the benevolent sexism towards women. Next, we included a questionnaire asking mothers if they sought help and we examined their perceptions of warmth or compassion of their OBGYN.

© UTPB Journal of Undergraduate Research, 2021.