

April 22, 2022

APEIRON

WASHBURN
UNIVERSITY



The Apeiron is an ancient term offered by Anaximander of Miletus in the 6th century B.C. that embraces the spirit of this forum. As with the Apeiron, which is infinite and boundless, all inclusive, eternal, and unaging, this forum is designed to be inclusive with respect to student research, scholarship, creative activities, and community engagement. It is dedicated to the proposition that students are capable of work that knows no limits and transcends all boundaries.

Each student participant in the Washburn University Apeiron has worked on his or her project under the supervision of a faculty mentor. The projects, which have been reviewed by the faculty, demonstrate creativity, originality, and a level of work superior to that normally expected of students. Today's presenters exemplify the spirit of the Apeiron.



www.washburn.edu/apieron

~ The Greek Alphabet ~

A α	Alpha	N ν	Nu
B β	Beta	Ξ ξ	Xi
Γ γ	Gamma	Ο ο	Omicron
Δ δ	Delta	Π π	Pi
E ε	Epsilon	Ρ ρ	Rho
Z ζ	Zeta	Σ σ	Sigma
H η	Eta	Τ τ	Tau
Θ θ	Theta	Υ υ	Upsilon
I ι	Iota	Φ φ	Phi
K κ	Kappa	X χ	Chi
Λ λ	Lambda	Ψ ψ	Psi
M μ	Mu	Ω ω	Omega

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WASHBURN UNIVERSITY CAMPUS MAP

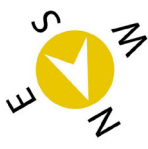
1700 SW College Ave., Topeka, Kansas 66621 785.670.1010

- AB - Art Building
- BE - Benton Hall
- BP - Bianchino Pavilion
- BT - Bennet Computer Center
- BTAC - Bradbury Thompson Alumni Center
- CA - Carnegie Hall
- CH - Carole Chapel
- FF - Fally Field
- FS - Facilities Services
- GF - Gahnstrom Field
- GC - Garvey Fine Arts Center
- HC - Henderson Learning Center
- IAF - Indoor Athletic Facility
- IH - International House
- KBI - KBI Forensic Science Center
- KH - Kuehne Hall
- LA - Law School
- LC - Lincoln Hall

- LEE - Lee Arena
- LLC - Living Learning Center
- MA - Mabee Library
- MB - Moore Bowl
- MO - Morgan Hall
- MU - Mulvane Art Museum
- NG - Neese Gray Theatre
- PC - Petro Allied Health Center
- RB - Rita Blitt Gallery
- SC - Stauffer Commons Food Court

- SR - Student Recreation & Wellness Center
- ST - Stoffer Science Hall
- TC - Tennis Courts
- TV - KTWU Television Studio
- UN - Memorial Union
- WC - White Concert Hall
- WFH - Whiting Field House
- WH - West Hall
- WUF - Washburn University Foundation
- WV - Washburn Village
- YS - Yager Stadium

- AA - Alpha Delta
- AΦ - Alpha Phi
- ΔΓ - Delta Gamma
- ΦΔΘ - Phi Delta Theta
- ΣΦΕ - Sigma Phi Epsilon
- ZTA - Zeta Tau Alpha



April 22, 2022

Schedule of Events

9:30 a.m.

Student Registration

Memorial Union, Washburn A & B Lobby

10:00 a.m.

Poster Setup

Memorial Union, Washburn A

10:30 a.m. – 12:30 p.m.

Fine Arts Presentations

Carole Chapel

1:00 p.m. – 3:00 p.m.

Oral Presentations

Henderson Learning Resources Center

Rooms 107, 118, 204, 208

3:00 p.m. – 3:45 p.m.

Welcome

Memorial Union, Washburn B

Dr. Courtney Sullivan

Chair, Apeiron Committee

Recognition of Student Designers

Rob Coffelt

Graphic Designer, University Mail & Printing Services

Student Designer:

Christina Noland

Introduction of Last Lecture

Eric McHenry

Last Lecture

Thomas Averill

Professor Emeritus of English

3:45 p.m. – 5:00 p.m.

Poster Session and Reception

Memorial Union, Washburn A

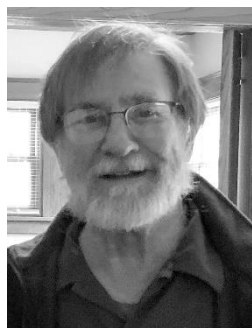


Last Lecture

“Writing Lessons from Mt. Hope Cemetery”
presented by

Thomas Averill, MA, MFA
Professor Emeritus of English

Memorial Union – Washburn B
3:00 pm



Thomas Fox Averill is Professor Emeritus of English at Washburn, where he taught courses in Creative Writing and Kansas Studies for 37 years. Educated at the University of Kansas (BA/English, 1971; MA/English, 1974) and the University of Iowa Writers Workshop (MFA/Fiction, 1976), he is an O. Henry Award short story writer and the author of 10 books, most recently the novel *Found Documents from the Life of Nell Johnson Doerr*. He helped found and was the first director of the Washburn Center for Kansas Studies. In 2010 he created the Thomas Fox Averill Kansas Studies Collection at Mabee Library, donating his large library of Kansas novels, plays, collections of poetry and fiction, histories, biographies, memoirs, letters, scholarly articles, collected folklore, manuscripts and ephemera gathered over 40+ years of an abiding interest in all things Kansas.



Fine Arts Presentations

10:30 a.m. – 12:30 p.m.

Carole Chapel

WTE denotes Washburn Transformational Experience

Moderators: Julie Noonan and Silas Huff

► **10:30 a.m. – 11:30 a.m. Carole Chapel**

Devising The Write Cinderella

**Madeline P. Dumler, Erin Watts, Josh Staats, Grey E. McCollum,
and Illiana Victoria Gallardo**

Mentor: Julie Noonan, Theatre

WTE

The Write Cinderella is a fully-student devised play. The play was developed through “moment work,” a contemporary devising method created by the Tectonic Theatre Company. This performance will present the play and answer questions about the devising process. The play is in one-act and tells the story of two step-sisters trying to connect by reading their favorite childhood book. Conflict ensues when one of the sisters desperately wants to try and change the story to be more exciting, while the other would rather keep the story the way it’s always been. Performers include: Madeline Dumler, Illiana Gallardo, Grey McCollum, Josh Staats, and Erin Watts. This production will be traveling to and representing Washburn University Theatre at the Edinburgh Fringe Festival in Scotland in August of 2022 and also be presented for several Topeka community groups in April.

► **11:35 a.m. – 12:05 p.m. Carole Chapel**

The Baroque Era: The Coming of the Viola

Allison L. Galvin

Mentor: Silas Huff, Music

My presentation will bring us back to the Baroque Era (1600-1750) and take a look at what the composer George Philip Telemann created. Telemann wrote both instrumental and vocal compositions, a whopping total of 3,000 pieces. I will talk about some of Telemann's major accomplishments and why I consider him the King of the Baroque Period. I plan to demonstrate his genality by performing several movements from his Viola Concerto in G Major.

► 12:15 p.m. – 12:30 p.m. Carole Chapel

Selections from España by Isaac Albeniz (Arr. by Bill Holcombe and Bill Holcombe Jr.)

Sarah Reineke, Kayden A. Matney, Dylan C. D. Rizzo, Faith Haller, and William Cason

Mentor: Rebecca Meador, Music

The Washburn University Honors Woodwind Quintet presents selections from *España* by Isaac Albeniz, and arranged for woodwind quintet by Bill Holcombe and Bill Holcombe Jr. This presentation will include a brief introduction on how musicians communicate during a performance and the importance of understanding historical context. The session will focus on a performance of the selected materials. A question-and-answer session will follow. Ensemble Members: Faith Haller, Flute; Sarah Reineke, Oboe; William Cason, Clarinet; Dylan Rizzo, Bass Clarinet; Kayden Matney, Horn.

Schedule of Oral Presentations

(HC = Henderson Learning Resources Center)

Time/Location	Presenter	Title
1:00 pm – 1:20 pm		
HC 118	Rachel L. Zimpfer and Keetan B. Munsell	<i>Production of Photodynamic Antimicrobial Material Through Attachment of Photosensitizers to Glass via Amide Linkage</i>
HC 204	Kassadee C. Clark	<i>The Women who Contributed to D-Day</i>
HC 107	Bijaya Basnet	<i>Determining the Apoptotic Timeline in Breast Cancer Cells Undergoing Photodynamic Therapy via Optical Scatter Imaging</i>
HC 208	Taton Smith	<i>Alternative Truths: A Case Study in the Dangers of Pseudoarchaeology</i>
1:25 pm – 1:45 pm		
HC 118	Rajesh Kandel	<i>A Micro Fabry-Perot Cavity for Chemical Characterizations of Nanoscale Particles via Raman Spectroscopy</i>
HC 204	Elizabeth Gail Pendergrass and Eliana Pendergrass	<i>Exploring the Representation of Women in Historical and Art Museums Across France</i>
HC 107	Justin A. Smith, Skyler J. Saunders, Eric R. Tilton, and Tilak Thapa	<i>Appsterchef</i>
HC 208	Emily Myers and Emma Saffron Morrissey	<i>Truth and NAGPRA: Washburn's Collaboration with the Kansas Historical Society</i>
1:50 pm – 2:10 pm		
HC 118	Ryan Haller	<i>An Exploration of the Tutte Polynomial</i>
HC 204	Cheyenne Colwell	<i>World War Two's impact on Women's Fashion in France</i>
HC 107	Joshua Meinhardt, Ryan Murphy, and Kevin A. Conner	<i>CrypTech</i>
HC 208	Sidney R. Cavner	<i>Analysis of the Remains of the Koerner Mound Site</i>
2:15 pm – 2:35 pm		
HC 118	Ethan H. Nelson	<i>Self-Compassion As An Intervention Against Procrastination Among American College Students</i>
HC 204	Jessie Revell	<i>Lost children of Paris</i>
HC 107	Mara S. Gilbreath, Skyler J. Saunders, Alejandra Alonso-Olivas, and Vladislav Baidin	<i>Gaming Habits and Education Structure Preferences</i>
HC 208	Quay'Shawn A. Akins	<i>A Trip to NOLA: Black and White and in Color</i>
2:40 pm – 3:00 pm		
HC 118	Alex Griffiths	<i>Trans Men's Perspectives on Masculinity: Sexism, Male Privilege, and Marginalized Masculinities</i>
HC 107	Justin A. Smith, Edward W. Baker, Angelica Faye Comahig, and Brett Kulp	<i>Public Perception of Right to Repair and its Effects on Purchasing</i>
HC 208	Victor Ramirez	<i>Tours by Marguerite: An Authentic Telling of the Creole Culture in New Orleans</i>

Oral Presentations
1:00 p.m. – 3:00 p.m.
Henderson Learning Resources Center

WTE denotes Washburn Transformational Experience

Session α

Moderator: Jennifer Wagner

◆ **1:00 p.m. – 1:20 p.m.**

Henderson Learning Resources Center, Room 118

Production of Photodynamic Antimicrobial Material Through Attachment of Photosensitizers to Glass via Amide Linkage

Rachel L. Zimpfer and Keetan B. Munsell

Mentor: Sam Leung, Chemistry

In the past few decades, the use of photodynamic action has been directed toward cancer therapy due to non-invasive and specific cancer treatment potential. More recently, however, photodynamic action has been applied in an antibacterial setting. The current idea for application of photodynamic action is to attach a photosensitizer to a common surface such as glass or cloth. Such surfaces could be antibacterial in the presence of light with the appropriate wavelength. In this work, attempts were made to derive glass slides with 3-aminopropyltriethoxysilane (APTES) in order to provide amino groups on the glass surface that will allow the attachment of a photosensitizer through an amide linkage. Generally, a harsh cleaning procedure on glass was performed to remove any obstructions prohibiting proper interaction between the hydroxyl groups on the silica based glass surface and APTES. The clean glass was then treated with APTES. Subsequent attachment of methyl red (a model compound for a photosensitizer) using a dicyclohexylcarbodiimide (DCC) coupling reaction was unsuccessful. Currently, reliable procedures for the application of the APTES solution to glass and for the confirmation of amino groups on the glass surface are being investigated.

◆ **1:25 p.m. – 1:45 p.m.**

Henderson Learning Resources Center, Room 118

A Micro Fabry-Perot Cavity for Chemical Characterizations of Nanoscale Particles via Raman Spectroscopy

Rajesh Kandel

Mentor: Hoang Nguyen, Chemistry

Raman spectroscopy is a powerful analytical technique that detects a shift in optical wavenumber between the incident light and light scattered from the analyte. The Raman shift is dependent on the vibrational mode of the chemical bonds inside the analytes and capable of generating a chemical fingerprint of

molecules. The resulting Raman spectrum enables the chemical identification of various analytes, allowing for a wide range of applications in chemistry and biological studies. However, conventional Raman requires a relatively high sample concentration, making it not suitable for direct cellular investigation. A micro Fabry-Perot cavity system could amplify the optical Raman signal when the scattered light from the sample meets the resonance condition of the cavity. A Fabry-Perot simple cavity is formed when two highly reflective surfaces are positioned within a few micrometers facing one another. The resonance condition of the cavity can be fine-tuned by fixing one mirror and moving the other mirror precisely using a shear piezo. The precision in the movement of the mirror-on-shear-piezo was calibrated with a motion-voltage response rate of 13.41 nm per V. However, we are working on improving the stability of the mirrors to allow for an more stable cavity and more well-defined resonances.

◆ 1:50 p.m. - 2:10 pm.

Henderson Learning Resources Center, Room 118

An Exploration of the Tutte Polynomial

Ryan Haller

Mentor: Jennifer Wagner, Mathematics and Statistics

The Tutte Polynomial is a mathematical tool used in Graph Theory. It can be used to describe the connectivity of a graph and determine other useful information about it, such as the number of spanning trees of a graph, the chromatic polynomial, and the number of acyclic orientations of a graph. Here, the Tutte Polynomial will be constructed using the operations of deletion and contraction, and some of its applications will be explored.

◆ 2:15 p.m. – 2:35 p.m.

Henderson Learning Resources Center, Room 118

Self-Compassion As an Intervention Against Procrastination Among American College Students

Ethan H. Nelson

Mentor: Michael McGuire, Psychology

WTE

Self-compassion, which is the application of compassion towards oneself, has been associated with numerous benefits toward mental well being. However, self-compassion has not been well-researched as an intervention against procrastination, an issue affecting many people, especially college students. This study aimed to investigate how self-compassion exercises would impact the level of procrastination college students had when completing general knowledge quizzes. After students took an initial survey, a negative correlation was found between self-compassion scores and the level of procrastination in a student. However, to compare the procrastination levels of students in a control group versus a self-compassion intervention group when taking the general knowledge quizzes, the sample size was too small to draw conclusions. Future studies should aim for larger sample sizes and better completion rates from participants in order to have findings.

◆ 2:40 p.m. – 3:00 p.m. Henderson Learning Resources Center, Room 118

Trans Men’s Perspectives on Masculinity: Sexism, Male Privilege, and Marginalized Masculinities

Alex Griffiths

Mentor: Michael McGuire, Psychology

WUmester WTE

Every person carries with them a series of intersecting identities (e.g. race, class, age, body type, sexuality) which serve to either marginalize or elevate them above others. This includes the dimensions of gender and social presentation. This presentation synthesizes the experiences of trans men specifically - how they are like cisgender men in their performances of masculinity, how they are different, and the complexities of their experiences with privilege and marginalization. Past research has found that transgender men are closer in cognition to cis men than women, and this review adds depth by finding that both cis and trans men have similar experiences navigating hierarchies of masculinity. Pre-transition experiences as well as the process of embracing or changing these identities can give trans men insight into the inner workings of masculinity which are explored here.

Session β

Moderator: Craig Carter

◆ 1:00 p.m. – 1:20 p.m. Henderson Learning Resources Center, Room 204

The Women Who Contributed to D-Day

Kassadee C. Clark

Mentor: Kerry Wynn, History

WTE

The presentation will show how the women of England’s Special Operations Executive, F-Section, assisted the Allied Forces during WWII and the successful infiltration of D-Day.

◆ 1:25 p.m. – 1:45 p.m. Henderson Learning Resources Center, Room 204

Exploring the Representation of Women in Historical and Art Museums Across France

Elizabeth Gail Pendergrass and Eliana Pendergrass

Mentors: Kerry Wynn, History; Courtney Sullivan, Modern Languages

WTE

In this presentation, we will be exploring the representation of women in the different art and history museums we visited on our trip to Normandy and Paris, France. We will delve into the stories of some of the women who were represented and the artwork. This presentation will also provide statistical analysis

on the representation of women at the different museums and ask the question of whether it is enough when you weigh the important significance the women had in the history of France.

◆ **1:50 p.m. – 2:10 pm.** **Henderson Learning Resources Center, Room 204**

World War Two's Impact on Women's Fashion in France

Cheyenne Colwell

Mentor: Kerry Wynn, History

WTE

The study focuses on how World War II affected women's fashion and created new fashion trends for the future. Materials women would use for clothing were no longer available to them and turned into military use.

◆ **2:15 p.m. – 2:35 p.m.** **Henderson Learning Resources Center, Room 204**

Lost Children of Paris

Jessie Revell

Mentors: Kerry Wynn, History; Courtney Sullivan, Modern Languages

WTE

During the initial takeover of the Vichy government in an effort to further tie themselves to Germany, Marshal Petain and the Vichy government put into place a system of efforts meant to deport Jewish immigrants and non-French citizens. As the Nazi leadership became more involved in the workings of the French government, they began the process of deporting all Jewish citizens of France. Paris had a large population of Jewish citizens and among them some three thousand children lost their lives after deportation to Auschwitz.

Session γ

Moderator: Nan Sun

◆ **1:00 p.m. – 1:20 p.m.** **Henderson Learning Resources Center, Room 107**

Determining the Apoptotic Timeline in Breast Cancer Cells Undergoing Photodynamic Therapy via Optical Scatter Imaging

Bijaya Basnet

Mentor: Vincent Rossi, Physics & Astronomy

Light scattered by cells provides a deeper insight into cellular structure. Optical Scatter Imaging (OSI) provides a unique tool for analyzing scattered light in cellular imaging. Observed changes over time of the light scattered by cells are indicative of morphological changes within cells in time. We have designed

and constructed a Digital Fourier Holographic Microscope (DFHM) for cellular imaging. With our system we can measure morphological changes in cells in real time and generate holographic reconstructions of cells. We are interested in the morphological changes in breast cancer cells undergoing aminolevulinic acid (ALA) mediated Photodynamic Therapy (PDT). ALA is a photosensitizing agent that when exposed to light converts oxygen molecules to Reactive Oxygen Species (ROS), which damage cells. During ALA-mediated PDT, mitochondria are the targeted site for damage, thereby causing cells to die via apoptosis. We are using the DFHM and OSI in order to observe the mitochondrial swelling associated with the onset of apoptosis in ALA-mediated PDT of breast cancer cells. This project aims to determine the timeline of the onset of apoptosis in breast cancer cells undergoing ALA-mediated PDT.

◆ 1:25 p.m. – 1:45 p.m.

Henderson Learning Resources Center, Room 107

Appsterchef

Justin A. Smith, Skyler J. Saunders, Eric R. Tilton, and Tilak Thapa

Mentor: Nan Sun, Computer Information Sciences

Appsterchef is a mobile application designed to make finding and creating recipes simple and powerful. This application allows users to search for recipes by name or ingredient, add and share new ingredients and recipes, and create a shopping list from recipes or ingredients. After selecting a recipe to view, users will see all ingredients required for the recipe, their respective measurements, instructions, images, and user comments and ratings. Appsterchef is developed using Android Studio and implements Google's Firebase database.

◆ 1:50 p.m. – 2:10 pm.

Henderson Learning Resources Center, Room 107

CrypTech

Joshua Meinhardt, Ryan Murphy, and Kevin A. Conner

Mentor: Nan Sun, Computer Information Sciences

CrypTech is a lightweight, user-friendly Java program that is designed to encrypt, decrypt, and hash files. It features a mainframe that prompts the users to select files they wish to manipulate and process the files based on user choices of algorithms. The program features multiple encryption and decryption algorithms which help keep information that you want encrypted away from other programs that do not have the correct decryption algorithms. The hashing function is to help the users determine if the files have kept integrity. The encryption algorithms are AES, DES, RSA, and Blowfish. The Hash algorithms include MD2, MD5, SHA-1, SHA-256, SHA-384, and SHA-512. The tools we use to create this program are Visual Studios Code, Java, and GitHub.

◆ 2:15 p.m. – 2:35 p.m. Henderson Learning Resources Center, Room 107

Gaming Habits and Education Structure Preferences

**Mara S. Gilbreath, Skyler J. Saunders, Alejandra Alonso-Olivas,
and Vladislav Baidin**

Mentor: Nan Sun, Computer Information Sciences

With the recent increase in the offering of hybrid and online classes due to Covid and the fact that many people who had more downtime spent increased amounts of time playing video games, we conduct this research to investigate if there is a relationship between time spent playing online video games and educational course structure preferences. In this research we conduct a survey to collect data. We then analyze the data to see if playing online video games and preferences in certain course modalities are correlated. We also report students' general preference of course instruction format and the reasons behind the preference. These research findings may be helpful for creating course schedules in future semesters to best benefit students' learning styles.

◆ 2:40 p.m. – 3:00 p.m. Henderson Learning Resources Center, Room 107

Public Perception of Right to Repair and Its Effects on Purchasing

Justin A. Smith, Edward W. Baker, Angelica Faye Comahig, and Brett Kulp

Mentor: Nan Sun, Computer Information Sciences

The purpose of this research project is to determine public opinion and knowledge over the concept of Right to Repair for electronic devices. Right to Repair encompasses many facets, including consumer rights, environment, purchasing habits, legislature, and economics and has recently seen rising popularity. We conduct a survey study to elicit what the public knows and feels about Right to Repair with these dimensions in mind. We believe the results of this research can inform others or be used by lawmakers and activist groups to alter the landscape of the electronic computing industry.

Session δ

Moderator: Ashley Maxwell

◆ 1:00 p.m. – 1:20 p.m. Henderson Learning Resources Center, Room 208

Alternative Truths: A Case Study in the Dangers of Pseudoarchaeology

Taton Smith

Mentor: Laura Murphy, Sociology & Anthropology

*WU*mester *WTE*

Archaeologists uncover truths about the past through scientific analysis of cultural materials, while those practicing pseudoarchaeology seek to profit from their own truths by promoting ideas not accepted by the profession. Many of these theories have been used in sinister ways to influence the spread of false

interpretations of the past across various media platforms, which has had drastic impacts on the public's perception of the overall scientific process. To better understand these damages, we examine a case of pseudoarchaeology that debates who the first peoples were to colonize the Americas. The Solutrean Hypothesis states that ancient explorers from the Solutrean region came to North America 20,000 years ago and were the first people to inhabit this continent long before Native Americans. Pseudoarchaeologists connect this hypothesis with the fringe "Lost White Race" theory, which argues that Europeans were the first to settle North America. While the Solutrean Hypothesis has been debunked, we argue that the provocative claim that ancient Europeans were in North America first promotes ideas of eurocentrism and white superiority, harming the truth about the continents' first Indigenous populations. By reviewing genetic information, currently accepted North American migration hypotheses, and recent events related to "Lost White Race" proponents, we attempt to answer the questions surrounding the dangers of alternative truths from the past that impact the present.

◆ **1:25 p.m. – 1:45 p.m.** **Henderson Learning Resources Center, Room 208**

***Truth and NAGPRA: Washburn's Collaboration with the
Kansas Historical Society***

Emily Myers and Emma Saffron Morrissey

Mentor: Ashley Maxwell, Sociology & Anthropology

WUmester

The relationship between the United States and Indigenous peoples holds a history of pain, violence, and dehumanization, a truth that is often overlooked. Alongside the forceful occupation of native land and systematic oppression of Indigenous peoples, most of the knowledge acquired regarding our collective understanding of biological and cultural information of ancient peoples in the Americas has come from the direct analysis of Indigenous remains and artifacts, typically taken by force. It has only been in recent years that concrete action has taken place for the protection of Indigenous remains, seen with the 1990 Native American Graves Protection and Repatriation Act (NAGPRA). The state of Kansas also recognized the necessity of protecting, identifying, and repatriating human remains through the 1989 Unmarked Burial Sites Preservation Act (KSA 75-2741 - 75-2754). In Washburn University's Anthropology program, students had the opportunity to assist in the identification of Native American remains loaned from the Kansas Historical Society (KSHS) to aid in the repatriation process to federally recognized tribes in Kansas. A biological profile of remains from a 1956 excavation at Pfaff Site (14NS319) was conducted using bioarchaeological methods learned in AN300 Bioarchaeology of Death and Burial to understand the importance and truth of NAGPRA and the proper handling of Indigenous remains.

◆ **1:50 p.m. – 2:10 pm.** **Henderson Learning Resources Center, Room 208**

Analysis of the Remains of the Koerner Mound Site

Sidney R. Cavner

Mentor: Ashley Maxwell, Sociology & Anthropology

WTE

The Kansas Historical Society in cooperation with NAGPRA has given permission to Washburn University to provide analysis on a sample of prehistoric commingled Native American remains to aid in repatriation efforts. The Koerner mound site near Ness City, Kansas was originally excavated by Tom

Barr and Jim Marshall. The primary research from this site has previously been focused on the burial artifacts. This study is on the minimum number of individuals alongside the artifacts for repatriation to modern Native American/American Indian groups in the region. These remains have been analyzed by bone to determine how many of what kinds of bones are present. Bones were separated into separate bags so that each bag could be inventoried and categorized. Fragments from the bags were inventoried and compared to others to determine if any fragments articulated. Each fragment is recorded as what bone it belongs to, its completeness, how many other fragments it articulates with, and any additional notes. Within the notes any visible bone element is noted. A bone element is a feature that is particular to a specific bone. This element can help determine what bone the fragment belongs to and which side of the body it is a part of. Upon initial analyses the most consistently intact bone was the temporal bone, specifically the petrous portion. The temporal bones of one side, left or right, can be counted to estimate the minimum number of individuals present at the Koerner mound site.

◆ **2:15 p.m. – 2:35 p.m.** **Henderson Learning Resources Center, Room 208**

A Trip to NOLA: Black and White and in Color

Quay'Shawn A. Akins

Mentor: Courtney Sullivan, Modern Languages

WTE

Over winter break of January 2022, I traveled with the Washburn French Club to New Orleans and nearby plantations to study the important historical legacies of French and Creole cultures in this important southern city. As a film major deeply interested in the power of images and French cinema vérité, I shot footage of the Mississippi River, Saint Louis Cathedral, and the French Quarter in black and white to show how New Orleans is inspired by French filmmakers. In most French films, directors use a 16:3 frame and use fast-paced cuts with black and white and I have always admired this awesome style. To create a cool ambiance, I selected the song "Ici" by Eric van Der Western to accompany the images and to remind the viewer of the importance of jazz in New Orleans. My short switches to color when framing images of le Musée de F. P. C., the Whitney Plantation, and the Smoothie King Area because I wanted to switch from a French feeling to a real city experience feeling, and I also thought it was respectful to really show the details of the plantation/Creole house.

◆ **2:40 p.m. – 3:00 p.m.** **Henderson Learning Resources Center, Room 208**

Tours by Marguerite: An Authentic Telling of the Creole Culture in New Orleans

Victor Ramirez

Mentor: Courtney Sullivan, Modern Languages

WTE

This short documentary provides a spotlight on "Tours by Marguerite," a visit of the French Quarter provided by company founder, Lawson Ota, that focuses on Free People of Color of Louisiana. The film hopes to direct people to a factual-authentic telling of the historical Creole culture within New Orleans by highlighting the tour and person who honors them.

Poster Presentations

3:45 p.m. – 5:00 p.m.

Memorial Union, Washburn A

WTE denotes Washburn Transformational Experience

1

Diaper Drive-Expanded

Alicia Lynnette Hay

Mentors: Sangyoub Park, Sociology & Anthropology; Kristine Hart, Center for Community & Civic Engagement

WTE

Diaper need is the lack of sufficient diapers to keep an infant dry, comfortable and healthy. A lack of diapers can cause a multitude of problems both for infants and for their parents. That is why I am seeking to expand the Diaper Drive program hosted by Dr. Sangyoub Park of Washburn University Sociology & Anthropology. The Diaper Drive collects diapers and monetary donations all of which go to non-profit organization Community Action. Dr. Park has facilitated the Diaper Drive since 2018, but currently, only Sociology 310: Social Class in the U.S. participates in facilitating the Diaper Drive. My goal through this project is to increase student participation across campus and their own interest in helping their community. Through implementing the Diaper Drive into introductory level courses such as Introduction to Sociology, Social Problems, and the Washburn Experience, I believe it is possible to grow this project to be even more substantially beneficial for Washburn, its students, Community Action, and Topeka as a whole.

2

Classroom 2 Community: Reflections and Analyses

Kayce Janae Chilson, Aaron D. Sibold, Alexis Gaudreau, Peter Kweku Afful, Trevonne C. E. Parker, and Katelynn M. Boyer

Mentor: Tracy Routsong, Bachelor of Integrated Studies

*WU*mester *WTE*

Classroom 2 Community was an integrated effort between multiple educational units to create educational modules on topics relevant for those interested in working with diverse populations. The modules include topics on sustainability, motivational interviewing, quality improvement processes, quadruple aim, Team Steps, social justice, communicating crisis information, business ethics, leadership of self, and trauma informed care. Integrated Studies is a degree in which students design their own majors based on interests and future goals. Each student analyzed information within the modules through their unique lens.

3

Survey of Mesopredators at Box Turtle Field Sites

Sean J. Kahler

Mentor: Benjamin Reed, Biology

WTE

Many factors are known to influence the behavior and ranging of wild animals. One such factor is the presence of predators, which can drastically influence where an animal chooses to go for foraging, mating, and thermoregulatory opportunities. In this proposed study, the density and types of predators will be assessed and correlated with previous and continual ranging data of the ornate box turtle (*Terrapene ornata*). We have three previously established turtle study sites each with a unique habitat type and thus likely different types and abundances of potential predators (such as badgers, skunks, coyotes, fox, racoons, rats, etc.). At each site, thorough scouting determined the location of our camera traps. A camera was hung at each of three locations expected to be the best travel routes for wildlife. Deer and raccoons were, by far, the most photographed wildlife, while badgers and bobcats were most infrequent and only appeared on certain cameras. We also examined species trappability for cameras in different habitat types. Understanding the basic demographics of mesopredators can help determine the general health of an ecosystem, including the trophic levels above and below the species we examined.

4

Are Communication Issues at the Core of Social Problems?

Travis Ron Gardenhire

Mentor: Carson Kay, Communication Studies

WTE

The study of this presentation shows that communication plays a critical role in addressing social problems in America. It is my intent to explain what these social issues are and how communication impacts them, whether it is positive or negative. Furthermore, I will examine how power and conflict plays a role in communication as it relates to social issues. Among the topics I will cover are racism, education, poverty, and war, with an emphasis on conflict as a means of communication. Conflict can take many forms, but it is typically defined as a serious disagreement or argument. As a result of this presentation, we will be able to shed light on the social issues that we encounter in America, and also break them down so that we can better understand where they come from, how they are developed, and also how they are resolved. I look forward to discussing all of this in my poster presentation.

5

Cultural (mis) Translation: The Hojoki Project

Holly Shimizu

Mentor: Madeline Eschenburg, Art

WTE

My Apeiron project is an attempt to visualize the arbitrariness of signs and the unavoidable bias in understanding different cultures via the medium of traditional visual arts. This work is an illuminated manuscript of Hojoki (方丈記), one of the most famous works of Japanese classical Buddhist literature, with a very European aesthetic appearance. Since the work appears to be an European illuminated manuscript at first glance, the audience is likely to try to interpret the work in a Western context. However, the work is in fact about the traditional and philosophical Japanese concept. Therefore, all

interpretations in the Western context are fundamentally misinterpretations. Through this project, I am hoping to raise the issue of the phenomenon that we often overlook the truth by judging things only by their looks, not by the insides. My poster will include explanations of the process of making the works (with pictures and texts), pictures of actual medieval manuscripts and some excerpts from Hojoki (in Japanese, English, and Latin), and a description of the philosophy behind the work.

6

Comparing DNA Extraction Success Rates from Ornate Box Turtle (*Terrapene ornata ornata*) Mouth Swabs

Jaelen Matthews

Mentor: Joshua Smith, Biology

Numerous turtle species native to the United States are illegally trafficked. Determining the origin of a confiscated turtle can allow investigators to know where these trafficking events are occurring. A DNA database for turtles based on location would aid in this determination. To create a database, DNA needs to be successfully obtained. Previous methods for turtle DNA collection include blood and nail clippings, which are detrimental to the turtle's well-being. The use of saliva offers a less invasive way to obtain turtle DNA. The aim of this project is to evaluate different DNA extraction methods for saliva from the Ornate Box Turtle (*Terrapene ornata ornata*). Using the AutoMate Express extraction robot, we extracted DNA from mouth swabs from ornate box turtle populations in both Kansas and Nebraska using an enzymatic approach with Proteinase K only or Proteinase K and DTT. We found each method to be less than 50% successful in obtaining DNA. This could be due to the swabbing technique or an insufficient amount of DNA in turtle saliva. Future work will implement modified methods to improve extraction.

7

How Minority Stressors are Viewed within the LGBTQ+ Community

Emma K. Hamilton

Mentor: Jericho Hockett, Psychology

WTE

Minority stress is the higher level of stress that members of minority communities face, and minority stressors are the events, stigma or prejudice that lead to that stress difference (Meyer, 2003). Many studies have looked at the presence of minority stress, how it influences the mental health of minority groups, and what might help to counteract that stress (Rogers, et al., 2021). The LGBTQ+ community experiences minority stressors like discrimination, harassment, stigmatization, and rejection. The current study works to add to the understanding of minority stress and stressors by looking at it from the perspective of the minority, LGBTQ+ people. It's expected to show that minority stressor events that have to do with rejection, whether from peers or family, would cause the most distress. The results could be applied not only for a better psychological understanding of the community but also in society to help with understanding and advocacy for LGBTQ+ issues.

8

A Novel: Disappearance of You

Mikaela A. Miller

Mentor: Nora Derrington, English

WTE

Disappearance of You is a young adult romance novel. With aspirations of becoming a self-published author, I have worked on this novel as my Washburn Transformational Experience (WTE). I have worked with a book cover designer, edited numerous drafts, and revised based on external feedback. Throughout this process, I've learned creative techniques, the benefits of networking, and how to apply constructive criticism. To provide physical copies of my novel, I purchased them through Barnes and Noble Press. In addition, I have prepared my manuscript and cover to be compatible with IngramSpark guidelines for when I decide to publish. Thanks to this experience and my WTE mentor, I plan to one day self-publish this novel and pursue a writing career.

9

1,000-Years-Old; The Historical Buildings of Caen

Anna Rose Anderson and Loren E. Kuck

Mentor: Courtney Sullivan, Modern Languages

WTE

Our poster will be about the surviving historical buildings left in Caen. The city was heavily bombed in World War 2 when the allies were attempting to liberate it. Our poster will focus on photos taken of the buildings (two churches and one castle) as well as research into the buildings. World War 2 is a popular topic among Americans; however, a high focus is placed on the battles and U.S. involvement. The war itself has a lot of events going on so we want to highlight one of them, the survival of historical buildings. We think this is an important subject to cover because of how Caen has constructed their identity and history around events in their history. They have been around much longer than the United States and as such some of the awe comes from seeing buildings that are 1,000s of years old.

10

Preservation Hall; Its history of Jazz in New Orleans

Loren E. Kuck

Mentor: Courtney Sullivan, Modern Languages

WTE

This poster will be about the history of jazz in New Orleans, but with a narrower focus. Jazz has a long and rich history in New Orleans. Established in 1961, Preservation Hall was established as a place to honor jazz in New Orleans. But before that it was a place for art galleries. After a while it started inviting more jazz players to perform at the Hall to attract attention to the gallery, and eventually became a place for preserving Jazz. Jazz has not only a big part in the culture of New Orleans but also the experience when visiting. Preservation Hall is a fascinating place and is a unique experience and look back in time.

11

Gender Differences Regarding Food Preferences and Attitudes Toward Plant-Based Diets

Katrina Escobar

Mentor: Angela Duncan, Psychology

WTE

Stereotypes exist regarding eating patterns among males and females. Research suggests perceived gender roles influence attitudes toward and preferences for plant-based diets (De Backer et al., 2020; Gal & Wilkie, 2010). Socially influenced food choices impact males' and females' sense of identity, health, and overall well-being (Rosenfeld & Tomiyama, 2021; Rosenfeld, 2020; Krizanova & Guardiola, 2020), and can discourage deviation from expected food preferences. For example, eating meat is associated with masculinity, sexuality, and strength among males in Western society (Markowski & Roxburgh, 2019). Vegan and vegetarian men face negative stereotypes compared to women with similar food preferences, and are perceived as betraying social expectations for masculinity (DeBacker et al. 2020; Bogueva et al. 2020). Women also face social pressure to follow strict dietary patterns to combat body dissatisfaction and promote a "thin ideal" (Rosenfeld, 2020), and may be seen as incapable of governing their bodies (Merriman, 2010). Addressing food preference stereotypes is not only important for understanding and dispelling unfair eating expectations, but also for reducing meat consumption to positively impact the environment (Rosenfeld & Tomiyama, 2021; Rothgerber, 2013).

12

Substitution of Glutamic Acid at Position 102 in LDH of *Sphyrana lucasana* to Arginine Through Site-Directed Mutagenesis

Alisha Bajracharya

Mentor: Allan Ayella, Chemistry

WTE

Lactate dehydrogenase (LDH) reversibly converts lactate to pyruvate using NAD⁺/NADH as cofactors in anaerobic metabolism, hence it affects colon cancer cells metastasis via the Warburg effect. In this research, we'll be doing an E102R mutation using a site-directed mutagenesis kit to determine if there will be changes in the substrate specificity from pyruvate to oxaloacetate. Plasmid DNA obtained from positive clones will be sequenced and then transformed and expressed to grow in BL21-DE3 cells. Isolation of WT and mutant LDH proteins will be done using sonication, centrifugation, and affinity chromatography. We will then be testing for the enzyme specificity for this mutant by measuring Michaelis Menten's constant (K_m) and K_{cat}. We'll also be analyzing whether the highly conserved site in LDH in most organisms is conserved in *S. lucasana*. At the end of the experiment, we expect the substrate specificity for the mutant to increase when we use oxaloacetate and decrease for lactate as the substrate.

13

What Do the Way I Talk Got to Do with Anything?

Tonyce Jackson

Mentor: Madaline Walter, English

WTE

People's perceptions of others can be based off of both looks and the way that people talk. But, especially for Black and Brown people who are judged and sometimes even criminalized for the way that they talk. African American Vernacular English (slang) is used by tons of people but only some are at risk of having their vernacular influence the way that persons of the criminal justice system will view them. I intend to provide a solution to this problem but I also want to pose the question, "how would we prevent this and where should we start?"

14

Isolation and Identification of Microbes from Commercial Kombucha

Emily N. Munyer, Abigail D. Fette, Mya Marie Lacey, and Isaac Michael Edgett

Mentor: Susan Bjerke, Biology

WTE

Kombucha is a fermented tea that is consumed as a beverage and offers health benefits from probiotic microbes. Usually, flavoring is added to increase the palatability of the tea. The purpose of our research is to identify individual microbes that are present in kombucha. We cultured seven different types of microbes from three different brands of grapefruit flavored kombucha. Three microbes showed similar colony morphology which led us to perform tests to identify this microbe. The test results from gram staining, endospore staining, growth at 50 °C, and acid production supported our presumptive identification of this microbe as *Bacillus coagulans*. We also subjected each microbe to several differential tests looking for brown pigment production, gluconic acid production, oxidation of ethanol, the presence of the catalase and oxidase enzymes, sucrose fermentation, and gram stain profile. The microbes that were not *Bacillus coagulans* were three bacteria and one yeast. We obtained varied test results from those four microbes, so we proceeded to extract genomic DNA to analyze the 16S ribosomal RNA for bacteria and 28S ribosomal RNA for yeast which we hope will give us exact identification of each microbe. The results of our research will help other scientists gain insight into the identity of microbes commonly found in commercial kombucha.

15

Isolation of Microbes from Commercial Kombucha

Isaac Michael Edgett

Mentor: Susan Bjerke, Biology

Kombucha isn't your average everyday flavored/nonflavored tea. It's tea that has a culture of fermenting microbes, often bacteria, and these microbes are probiotic in nature. Kombucha is supposedly a healthy drink full of probiotics but on the labels of most commercial kombucha they don't give a list of microbes that are known to be in this common drink. Often labels just list "kombucha culture" or "culture." The purpose of our research was to isolate and identify any and all possible bacterial or eukaryotic microbes from the kombucha and identify them via differentiating tests such as oxidation and over oxidation of ethanol, production of gluconic acid, brown pigment production, presence of catalase enzyme,

fermentation of sucrose, alcohol tolerance, and mobility along with gram stain reactions to identify shape and arrangement of prokaryotic and or eukaryotic microbes. The results of our research will help get an idea of what types of microbes can be found in commercially-sold kombucha.

16

Adolescent Access to Mental Health Care During the COVID-19 Pandemic

Madison Ashworth

Mentor: Tucker Jones, Psychology

WUmester WTE

Adolescents are some of the most underserved individuals in our current system for treating mental health concerns. Given the rapid changes in the world due to the COVID-19 Pandemic, it is important to re-evaluate the current system of care for all those affected, but especially adolescents. Prior to the current pandemic, the field of psychology had started to have an increased interest in exploring the barriers individuals encountered when trying to seek access to mental health care. However, COVID-19 has revealed some of the larger faults of our current health care system (e.g. general access to affordable, remote care options). Although previous research has focused on theoretical recommendations for the general population, more focused efforts are needed to better treat the unique challenges associated with adolescence as well as provide adolescents with equal access to mental health care.

17

Sequencing and Annotation of the Adastra Bacteriophage Genome

Eliana Pendergrass and Qiana M. Tucker

Mentor: Andrew Herbig, Biology

Bacteriophages (phages) are viruses which only infect bacterial cells. Lytic phages replicate within their host and are released upon lysing the cell. Adastra, a lytic phage infecting *Bacillus subtilis*, was isolated from farm soil in Kansas. We have isolated DNA from the phage and subjected it to Illumina sequencing, which generated a 75.5X coverage of the genome. The 136,306 base pair contig was confirmed by PCR analysis. Using the Galaxy and Apollo web platforms, we performed structural and functional annotation, which predicted 201 genes including three transfer RNAs. 29% of the proteins encoded by Adastra had a predicted function, while 71% had no predicted function. Adastra is 98% identical to bacillus phage SP8 and thus belongs to the SPO1 family of phages. We identified genes coding for proteins involved with phage structure, DNA replication and metabolism, host takeover, and lysis. Our results contribute to knowledge of phage comparative genomics, insights into the host-phage relationship, and phage replication dynamics.

18

Relationship Between Physicochemical Variables and Diatoms in Surface Water of Lake Ypacaraí

Laura Santander Diaz

Mentor: John Mullican, Biology

The eutrophication of Lake Ypacaraí is the consequence of the accumulation of untreated waste from its immediate environment and its entire headwater, producing an increase in the concentration of nutrients (N and P) and in some cases the proliferation and exponential growth of certain photosynthetic microorganisms. The following work aimed to evaluate the relationship between 10 physicochemical variables and 6 frequent diatoms, identified in eutrophic surface water samples from Lake Ypacaraí, to establish them as possible bioindicators of water quality. 26 monitoring campaigns were carried out during the 2012-2017 period. For the physicochemical determinations, the procedures established in the Standard Method of the 23rd edition were followed, while, for the quantification of diatoms, the Utermöhl method was used. For the statistical analysis (SPSS), the most frequent species and varieties of diatoms and the physicochemical parameters associated with eutrophication processes were selected, and then the Pearson Test was applied. The results showed that the variety, *Aulacoseira granulata* var. *granulata* was the only one that had a positive correlation with Total Phosphorus (44.6%) and Transparency (26.3%), for a value of $p < 0.001$. This result would explain why the density of this diatom increases when the concentration of Total Phosphorus (PT) is very high (0.717 mg/L – 1.04 mg/L). In conclusion, it can be indicated that the variety *Aulacoseira granulata* var. *granulata* can be used as a bioindicator of a eutrophic system with a high concentration of PT, in the case of Lake Ypacaraí.

19

Understanding Freedom of the Student Press

Christina Noland, Glorianna R. Noland, Olivia Serina Watson,

**Alyssa A. Storm, Maggie Cabrera, Kyle O. Manthe, Nicholas W. Wright,
and Emma N. Froese**

Mentor: Regina Cassell, Mass Media

*WU*mester

In February, the Student Press Law Center promotes its annual Student Press Freedom Day, which seeks to help college students understand their First Amendment rights. Students in MM426 Advanced Student Media Practicum partnered with Student Media and MM326 Student Media Practicum to investigate the campus knowledge of the Freedom of the Press. Class members interviewed more than 25 students, wrote articles about the Freedom of the Press, and solicited campus feedback about the topic. The research notes the difference between Washburn students who truly understand their rights to Freedom of the Press and those who associate the right of Freedom of Speech as identical to the right of Freedom of the Press. While the First Amendment is discussed across separate classes from a variety of programs, our data illustrates that students either cannot grasp the topic or that the vast majority of students have little weight in retaining such knowledge.

20

Effects of Musical Intervention on Short Term Retention of Secondary Language

Raina M. Alcantar

Mentor: Michael McGuire, Psychology

WTE

The purpose of the proposed study is to examine the effect of musical intervention on short term retention of foreign language terminology. Previous research has explored the role that music plays on memory (Ferreri et al., 2013) with some research suggesting that listening to music while studying may increase retention as measured on test score accuracy (Kämpfe et al., 2011). There is a formality with which foreign language is taught in school programs which often emphasizes the literary skills over verbal (de Groot, 2006). If there is an effect by listening to music in the target language and studying the target language, such a technique could be implemented as a tool in foreign language courses.

21

Ornate Box Turtle (*Terrapene ornata*) Identification via Pattern Recognition

Mason Chanay

Mentor: Benjamin Reed, Biology

WTE

Being able to repeatedly identify individual animals is essential for effective field and laboratory research. Traditional methods of animal identification tend to be invasive, or not effective long-term. Example methods include PIT (Passive Integrated Transponder) tagging, ear tagging, branding, and banding, which all require extensive handling and unnecessary stress for the animal. For chelonians, shell notching is a common method for long-term identification of individuals. Notching methods can be unreliable as the turtle ages and experiences other shell damage and wear. In this study we use WildID 1.0 photo recognition software to attempt to determine the efficacy of using photographs and pattern recognition to identify individuals of *Terrapene ornata* as a potential new strategy for identifying individuals over time. Two different angles were tested: carapace, and plastron. For the plastron trials 25 of 26 turtles successfully matched. The single turtle that did not match was reran with a different photo and matched. For the carapace 21 of 27 trials successfully matched. 3 turtles had no other photos in the data base and could not be reran. 3 other turtles were ran again with different photos and matched. We found that the use of photographs and the WildID pattern recognition software is a promising option for non-invasive identification of ornate box turtles.

22

Genome Analysis of the Konza Bacteriophage

Faith M. Butler

Mentor: Andrew Herbig, Biology

Bacteriophages (phages) are viruses which exclusively infect and replicate within bacteria. Konza, a phage isolated from creek bed sediment in southeast Kansas, is a virulent phage which specifically preys on the bacterium *Bacillus subtilis*. Following infection and replication, new Konza phages escape their

host by causing cell lysis. This relationship impacts the distribution and ecology of *B. subtilis* in soil and animal hosts. We isolated DNA from the Konza phage and subjected it to sequencing. Next-generation Illumina sequencing resulted in 87,139 reads representing 68-fold coverage of the genome. The assembled contig is 137,622 base pairs long. This closed genome was confirmed with PCR. The web-based Galaxy and Apollo platforms were used to perform structural and functional analysis of the Konza genome. We predicted 212 genes, including four transfer RNAs. Of these genes, only 28% encode proteins of known function. We identified proteins for phage structure, replication, and DNA metabolism. The Konza genome is most similar to phages in the SPO1 family of bacillus phages and shares 91% nucleotide identity with bacillus phage SP8, specifically. Our genome analysis contributes to knowledge of phage comparative genomics and reveals biological insights to Konza and its interaction with *B. subtilis*.

23

Pilot Study: Use of Ultrasound Technology to Assess Health and Egg-bearing Status of the Ornate Box Turtle

Katie Brighton

Mentor: Benjamin Reed, Biology

Ornate box turtles (*Terrapene ornata*) are an important component of Kansas habitats as they complete useful ecosystem functions such as being bio-degraders, seed and spore dispersers, and ecosystem engineers. Populations are declining throughout their range, likely due to habitat loss, disease, and human-induced mortality. Assessing reproductive health of a population can help us understand the overall health of that population. We plan on evaluating reproductive health of ornate box turtles by using novel technology: EI Medical EVO II ultrasound device. This ultrasound device is field portable and has the necessary attachments to scan through plastron and pre/post femoral windows to determine follicular health, egg-bearing status, flesh fly infection, and neoplasia. Turtles will be scanned throughout the season to examine health and egg-bearing changes. Investigating the long-term health of specific ornate box turtles can help us understand the factors that influence individual fitness, and at the population level, develop concentrated conservation efforts for populations of concern (limited or declining reproductive output).

24

Common Misconceptions about Louisiana Voodoo in Disney's The Princess and The Frog (2009)

Breanna Bermudez

Mentor: Courtney Sullivan, Modern Languages

WTE

Voodoo, along with many religions that originated in Africa, is commonly misinterpreted in the United States. On the trip to New Orleans that we took in January of 2022 with the French Club, we took a tour that discussed some of the common misconceptions about Louisiana Voodoo. For my project, I will be debunking these misconceptions and addressing how the Disney movie *The Princess and The Frog* (2009) further helped to feed false information to its viewers in regards to Voodoo. In the Disney movie, Voodoo is depicted as a type of black magic. For example, the Voodoo prince is shown singing a song about how the spirits on the other side are his friends. This song insinuates that a major tenet of Louisiana Voodoo involves selling your soul in order to become friends with evil spirits who will endow you with magic you

can use to your advantage. I would like to debunk these insinuations by taking into consideration that Voodoo was used as a healing method during the pandemics in nineteenth-century New Orleans. Once foreigners saw Voodoo followers practicing their rituals, they were quick to make assumptions and associate these rituals with black magic. Through a trip down the timeline of Voodoo, the goal is to use the facts to debunk the misconceptions depicted in the film *The Princess and The Frog* (2009).

25

Differences in Fallacy Usage Between English and Japanese on Social Media

Kenya Oi

Mentor: Carson Kay, Communication Studies

WTE

This study examines the differences in fallacy usage between English and Japanese social media communication. The comparative textual analysis identified the presence of 15 common fallacies among public Twitter posts ($n = 100$). Overall, ad hominem and casual fallacies most frequently appeared in both English and Japanese tweets. However, while many appeal to pity emerged in Japanese posts ($n = 7$), fewer emerged in English posts ($n = 1$). Implications of these findings suggest Japanese people tend to rely on their emotions when they discuss. The findings of this project could benefit people who try that communication on social media makes a better place to discuss and want to have a good discussion on social media.

26

Examining Buildings in the Vieux Carré District of New Orleans Through the Lens of Traditional French Architecture

Ethan M. Clark

Mentor: Courtney Sullivan, Modern Languages

WTE

This presentation is an analysis of several buildings in the Vieux Carré and their proximity to French architecture. Several sites in the neighborhood such as the Pontalba Buildings and the Old Ursuline Convent will be examined closely to expose French influence in overall design, style, and layout. One section will establish which elements of French Quarter architecture are authentic to France versus which elements are Spanish-inspired. This presentation will also explore French figures influential to the city and its iconic buildings.

27

Analysis of the Role of Single Amino Acid Substitutions in the Stability of Lactate Dehydrogenase in Halophilic Organisms.

Keetan B. Munsell

Mentor: Allan Ayella, Chemistry

WTE

Since their discovery in 1913, halophilic organisms have been the subject of a plethora of scientific research such as their indistinguishable ability to conduct typical cellular tasks in high saline

environments without observed difficulty. However, for the past two decades there has been a significant lapse in research on halophilic lactate dehydrogenase (LDH). The current idea for researching halophilic LDH is due to an advancement of bioinformatic and molecular analysis techniques. Credence can be delivered to hypothesizes for the significant increased stability of LDH in higher salt gradients. Due to extensive bioinformatic evidence, a link between excess amino acid residues and the formation of a hydration layer is suggested. Site directed mutagenesis of LDH from *Sphyaena lucasana* will be conducted to create a mutation within the wildtype LDH of halophilic organisms. The altered amino acid sequence made at lysine 269 to an aspartic acid at 269 will induce a change in stability of the LDH isoforms. We expect to see the formation of a mild hydration layer due to the introduction of a net negative charge inducing an increase in the hydrophilicity of the LDH. Excess solvents will become blocked from further denaturing the enzyme promoting an increased operational efficiency at higher salt gradients than unaltered *Sphyaena lucasana* at the same gradient.

28

Graphene-Based Quantum Dots for Bioimaging

Avinash Dhimal

Mentor: Hoang Nguyen, Chemistry

Quantum dots (QDs) are semiconductor nanocrystals whose optical properties are dependent on their sizes. Their versatility and biocompatibility allow for widespread applications including medicine, engineering, and manufacturing. At the same time, the small size and high cytotoxicity of heavy metal-based quantum dots create a high barrier for extensive use inside biological systems. In this project, we are discussing the synthesis protocols of graphene quantum dots (GQDs) from pyrene and the application of optical microcavity to determine the sizes of our synthesized product. In addition to the inherent strengths of quantum dots such as stable fluorescence and adjustable band gap, these graphene-based particles have many advantages of graphene, including low cytotoxicity, high surface area, and good solubility. GQDs are therefore suitable for applications in biological imaging, tracking, and sensing inside a cell. The main goal of this project is to synthesize and fine-tune GQDs. We are working on characterizing the size and optical properties of our synthesized dots and will later introduce them inside living cells and quantify their cytotoxicity.

29

Use of Real Time PCR in Sexing Forensically Important Blowfly Eggs

Nikolas Connolly

Mentor: Joshua Smith, Biology

WTE

In forensic entomology, aging insects on a body allows for an estimate of time since death. The most common insects used for such estimates are blow flies, which lay eggs on the corpse. Previous work performed on blow fly sex determination shows when eggs are initially laid, only the female form of transformer is present for all individuals, with the male form evident later. This temporal pattern of gene expression affords an opportunity to use the presence or absence of the male form of transformer to age the eggs of blow flies, helping provide an estimate of the time since death. Current methodology visualizes the transformer gene using PCR followed by gel electrophoresis. This research is focused on using real-time PCR as a more sensitive, quicker, and objective method of transformer detection. The goal of this research project has been to develop a reliable real-time PCR assay to successfully sex eggs in the

forensically important blow flies, *Chrysomya megacephala* and *Cochliomyia macellaria*. Currently, novel primers are being evaluated for their use in reliably determining sex in immature blow fly specimens.

30

Comparison of Flesh Fly (*Cistudinomyia cistudinis*) Prevalence throughout Midwest Populations of Ornate Box Turtles (*Terrapene ornata*)

Aubrey Anne Gauntt

Mentor: Benjamin Reed, Biology

WTE

Parasitism is one of many threats to the long-term persistence of host populations. Flesh flies, a group containing thousands of species, represent one type of parasite which infect various different members of the animal kingdom including mammals, reptiles, amphibians, and chelonians. Many taxonomic groups, including chelonians, have species-specific flesh fly parasites. Here, we focus on the ornate box turtle (*Terrapene ornata*) and recent observations of flesh fly parasitism. Due to the unreliability of past records, the identity and prevalence of the species infecting ornate box turtles requires more investigation. In our study, we monitored five different populations of ornate box turtles while examining each individual turtle for signs of flesh fly infection. We extracted flesh flies, noting the number of larvae found, and how many turtles were infected in each population. We also used genetic analysis to determine the species of the flesh fly causing myiasis as *Cistudinomyia cistudinis*. We found that prevalence of this species was highly variable between our populations which may indicate that certain populations are at greater risk of decline moving forward.

31

Engagement with Topeka's Young Community – Topeka Youth Project's Youth Court

Tierney Kay Kester

Mentor: Kristine Hart, Center for Community & Civic Engagement

WTE

The Topeka Youth Project has developed another opportunity of engagement for Topeka's young community called the Topeka Youth Court. The Topeka Youth Court serves to provide the youth with an opportunity to engage in their own young community by serving as judges, attorneys, or jurors in a "trial by peer" sentencing for other youths that have engaged in some type of problem behavior, whether a traffic ticket, school rule violation, or other crime punishable by the law. Rather than being ignored as a "minor offense" by the juvenile court system, the Youth Court allows respondents to confront and address their behavior by exploring the impact of their infractions and receiving an opportunity to make up for the harm they caused and develop needed competencies. Youth involved in volunteering as either a judge, attorney, or juror gain valuable skills through their experiences by being afforded the opportunity to understand the impact and nature of these infractions and determine for their peers the necessary sentencing to atone for their actions.

32

Effects of Mask Wearing on Respiratory and Cardiovascular Parameters of College-Aged Students while Resting and Walking

Sydney Rosemann, Kelsey R. Gordon, Courtney N. Bayliss, and Verena Vesely

Mentor: Paul Wagner, Biology

Wearing masks to help prevent the spread of COVID-19 has created controversy in society. Complaints that the masks were hot or uncomfortable were common. Some have stated that wearing of masks dramatically reduces oxygen in the blood or can cause carbon dioxide retention. While the masks should create some resistance (since they are blocking flow of air out of the mouth and nose into the surrounding atmosphere), the body also has compensatory mechanisms to make sure that adequate gas exchange is achieved. We asked test subjects (18-25) if they would participate in two runs of an experiment. In both cases, subjects were asked to wear a device that measures O₂ and CO₂ levels, as well as the flow of air, the respiratory rate, and the heart rate. We also asked subjects to rate their perceived exertion levels, as well as perceived body temperature, fatigue, and discomfort. During one trial, subjects wore a disposable medical mask under the recording device and in another trial, the simply wore the recording device. Our results seem to indicate that even if the perception is that the masks are not comfortable, healthy young individuals are able to compensate for any alterations in gas exchange that the masks may cause.

33

The Venerable Henriette DeLille: A Free Woman of Color in New Orleans on the path to Sainthood

Michealla B. Kastrup and Elisa Lynne Hiserote

Mentor: Courtney Sullivan, Modern Languages

WTE

This presentation will cover the life and legacy of Henriette DeLille, a New Orleans-born Creole of color, who dedicated her life to faith, people of color, children, and the less fortunate. With photos of city monuments and museums that pay homage to her, this presentation explores the significance of her work founding the Sisters of the Holy Family order in 1836, when racial prejudice prevented her from joining a religious order such as the Ursulines. She is the first African American named as Venerable on her path to sainthood in the Catholic Church, and as such, this presentation explores her contribution to the city of New Orleans and its culture of Catholicism.

34

Female Resistance Fighters of WWII

Elisa Lynne Hiserote and Michealla B. Kastrup

Mentor: Courtney Sullivan, Modern Languages

WTE

This presentation will cover the lives of many women in the French Resistance during WWII who fought vigorously to expel the Nazi regime in France. With real-life stories of their courageous acts and fearless fighting, this presentation shows the underlying story of the fight at home while others were at war for their families.

35

Fluorescence Apoptosis Assays of Breast Cancer Cells Post ALA-mediated PDT

Lauren Moore

Mentor: Vincent Rossi, Physics & Astronomy

Photodynamic Therapy (PDT) is a selective and targeted cancer therapy which has generated a good deal of investigation over the past decade. Breast cancer is of particular interest and a suitable candidate for PDT, which promises to be an alternative approach to radiation therapy in order to clear tumor margins after surgery. We are particularly interested in determining the apoptotic response of cells undergoing PDT in real time. A Digital Fourier Holographic Microscope (DFHM) was designed for use in Optical Scatter Imaging (OSI) as an optical assay in order to measure changes in mitochondria in real time as indicative of apoptosis in response to PDT. As a test of the optical assay's efficacy, cells are treated post-PDT with an established apoptosis assay. This assay stains cells with fluorescent markers to differentiate between apoptotic and necrotic cells while simultaneously measuring cell viability. Along with the experimental (PDT) group, control experiments are similarly analyzed via the optical and standard assays, controlling for light toxicity, cell viability within the imaging stage and apoptosis via a known apoptotic agent.

36

Keith Phase Osteobiography

Taton Smith, Kristen Radell, and Sidney R. Cavner

Mentor: Ashley Maxwell, Sociology & Anthropology

The Keith Phase is part of the Plains Woodland cultural period that spans from 100 BC to beyond AD 500 and includes the High Plains of Kansas and Nebraska. It was first named by Dr. Martin Kivett in 1949 and is defined by small hunter gatherer groups/family units that utilized various ceramics, bone artifacts, and stone tools. There is evidence at Keith Phase sites of hunting bison, deer, and antelope and cultivating sunflower and squash. The Kansas Historical Society (KSHS) is working with Washburn's Anthropology department to repatriate Indigenous remains recovered from Keith Phase sites. The remains and artifacts examined in this study were recovered from the Vohs site (14OB401) discovered in 1956 by Leonard Vohs, and formally recognized by the Kansas State Historical Society in 1966. The human remains and associated funerary artifacts examined were recovered in 1967 during an excavation performed by members of the Kansas Anthropological Association. This burial collection consists of commingled skeletal remains representing an estimated two individuals and four pottery shards. Members of this case study used bioarcheological methods to estimate a biological profile and identify pathological and traumatic conditions to reconstruct their lived experience. By completing this work, we intend to reinstate the identity of the studied individuals, as well as contribute to the repatriation efforts of the Kansas Historical Society.

37

Truth in Bioarchaeology

Mara J. Coufal, Brailey Moeder, and Dy-Esha Risby

Mentor: Ashley Maxwell, Sociology & Anthropology

WUmester

There is truth behind everything we encounter in our daily lives. Washburn University has taken on the challenge to encourage our community to speak the truth of ourselves, our peers, and to power. Truth is a powerful word that can have various meanings throughout different contexts and can shape the world we live in today through knowledge, beliefs, and history. An Osteobiography does that by telling an individual's life-story through their remains. An archaeological site, 14SD35, was excavated at Museum Creek located in Sheridan County, KS. A single, mostly complete skeleton of a young individual was excavated. This site showed clear indications that this case was associated with the Keith Phase, which is approximately from A.D. 1-500 and A.D 800-900, with a range of sites located throughout southwest Nebraska, northwest Kansas, and eastern Colorado. Based on the radiocarbon date, geographic locations, and no evidence within the burial that can be associated with other prehistoric time periods, this burial can be classified into the Keith phase. By using bioarcheological methods to age, sex, and identify pathological and traumatic conditions of the individual, a reconstruction of the life history, or the truth, of Keith Phase Native American/American Indian from Sheridan County, KS can be accomplished.

38

Raised Voices: A Content Analysis of the Impact of Media on Awareness for Missing and Murdered Indigenous Women and Girls (MMIWG)

Emma Saffron Morrissey

Mentor: Sharon Sullivan, Theatre

Since the dawn of North American colonization, Indigenous communities have faced a plethora of deliberate forms of violence. Indigenous women and girls have continued to experience an elevated level of violence throughout time, and acts of domestic and sexual violence still plague these communities today. According to the National Congress of American Indians, the murder rate of American Indian/Alaska Native women is almost 3 times that of non-Hispanic White women. This horrific phenomenon is addressed through the movement of Missing and Murdered Indigenous Women and Girls, known as MMIWG, which calls for awareness to the murders and disappearances of Indigenous women. Research on this epidemic of violence across Native communities has been few and far between, with scholarly endeavors to investigate the extent of these crimes only occurring in recent years. Due to the lack of attention on this issue, many Indigenous activists have utilized social media platforms such as TikTok, Twitter, and Facebook to raise awareness for MMIWG. Public focus on this issue has increased significantly over the past ten years due to information sharing through social media and other creative forms of expression. A content analysis on the impact of media on the awareness of MMIWG has been performed to estimate the influence of media to spread vital information across socioeconomic boundaries of knowledge.

39

Client Centered Care: Changing the Lives of Children in Crisis

Halla Kay Whitlock

Mentor: Angela Duncan, Psychology

WTE

Over this semester I have been spending my time interning at the Family Service and Guidance Center Crisis Building. I have built relationships with children in the community and their families. I have been learning de-escalation techniques for crisis. I am interested in and have been researching the impact crisis interventions have on those who have been through psychological trauma. The research articles explore different types of psychological trauma, and associated interventions. These articles assess how the different interventions have impacted the individuals.

40

Lockdown Relationships: Changes in Relationships During a Global Pandemic

Roge Lagahid

Mentor: Tracy Routsong, Communication Studies

Interpersonal romantic relationships experienced a wide range of challenges during the Covid-19 global pandemic and subsequent lockdown. Whether living together or apart, couples face a wide range of challenges such as too much time together, switching to a different work schedule or working from home, or a host of other issues. Using the Relational Dialectic Theory this research analyzes contradictions within the relationship, specifically the contradictions between the couple and their interactional desires.

41

Design, Construction, and Programming of Quantitative Phase Microscope to Achieve Prolonged Phase Imaging of Cells in vitro

Katherine C. Davidson

Mentor: Vincent Rossi, Physics & Astronomy

Quantitative Phase Imaging (QPI) is a method of measuring the phase variation of a light wave as it travels through a sample. Measuring this phase variation, which is impossible using normal methods of imaging, allows for the collection of information about the sample's depth and index of refraction. QPI is especially useful when applied to biophotonics, as it may be sensitive to phase changes due to cellular dynamics or cellular growth. An imaging incubator was built around the sample stage of the QPI device for CO₂ and temperature control so as to keep cells at physiological conditions for an extended period of time. As a proof-of-principle experiment, human breast cancer cells were imaged in the QPI-imaging incubator device for 48 hours. Our research aims to measure changes in cellular phase and morphologies as a result of mechanical and biochemical perturbations over extended periods of time. This proof-of-principle experiment is the first major benchmark towards achieving that broader goal.

42

Influence of Larval Environment on the Dispersal Behavior of Adult Cowpea Weevils, *Callosobruchus maculatus*

Khue N. Nguyen

Mentor: Rodrigo Mercader, Biology

Behavioral plasticity has the potential to considerably influence dispersal and consequently how we model biological invasions. In plant feeding insects, such as the cowpea weevil *Callosobruchus maculatus*, larval environment and adult prior experience have been shown to influence host choice in plant feeding insects. Furthermore, adaptation for host preference in *C. maculatus* has been shown to influence other behaviors such as dispersal propensity. However, whether larval experience can influence dispersal behavior in adult beetles is not known. Here we directly tested whether larval environment (host species) could influence dispersal behavior in *C. maculatus*. *C. maculatus* from the same population were raised in two different host environments, a high-quality host *Vigna unguiculata* (Cowpea) and a low-quality host *Cicer arietinum* (chickpea). Three 2-day old female beetles reared on either the high quality or low-quality host were painted and placed in dispersal arenas (10 replicates of each). Dispersal arenas consisted of two sets of patches connected by either a long or short distance from a starting patch, where the first habitat patch encountered after the short or long distance travelled contained the low-quality host and all other patches contained the high-quality host. The format of these arenas was based on a previous study that allowed a point of reference. Assays were run for 1 week, in which the location of each female (60 females) was recorded daily and the eggs laid across the arenas at the end of 1 week were recorded. Results of this study are discussed in reference to previous studies.

43

Effect of Using Qualified Language Assistive Services on Patient Outcomes

Francisca Rodriguez-Bolanos

Mentor: Crystal Stevens, School of Nursing

WTE

Many patients go to healthcare facilities and cannot participate fully in their care. This is the reality for many people in the United States with limited English proficiency. According to the United States Census Bureau (2020), 8.3% of the total United States population speaks English less than “very well.” This subject is interesting because minors and unqualified staff should not be used as interpreters in place of qualified translation services. The significance of this project is to identify the effect of using qualified language assistive services on patient outcomes. Altogether, the inability of those with limited English proficiency to obtain qualified translation services in healthcare is a serious problem that can lead to health and safety issues. These issues affect individuals in all aspects of care because they are not able to fully understand the language that care topics are being presented in. This matters because patients deal with very complex conditions that need full understanding by the patient to be able to manage. Access to professional translation services is beneficial because it decreases readmission rates, increases hospital monthly expenditure savings, and allows patients to participate in their own care.

44

The Relationship Between Behavioral Syndromes and Philopatry in Ornate Box Turtles (*Terrapene ornata*)

Samantha Y. Kim

Mentor: Benjamin Reed, Biology

Philopatry is an animal's tendency to move or stay in the same general location year-to-year. Tracking animal philopatry is important for understanding and preserving animal populations and habitats. Some factors that are believed to be related to philopatry include resource availability and distribution, mating opportunities, and behavioral syndromes. Behavioral syndromes contain five main axes which are activity, boldness, exploration, sociality, and aggression. These behavioral syndromes can be further extended into behavior types, ranking the animal along a spectrum for each axis, such as ranging from non-active to super-active for the activity axis. The purpose of this study was to identify potential relationships between sex, behavioral syndromes, and philopatry in ornate box turtles (*Terrapene ornata*). Data was collected via radio telemetry and behavioral assays on the same population of 24 turtles in both 2020 and 2021. Our results showed activity and boldness axes had a significant correlation with the degree of philopatry exhibited by individuals, but the exploration axis and sex did not show a significant relationship with philopatry. Despite an inherent variability in behavioral scoring and in monitoring ranging behavior, our measures of activity and boldness behavior types still showed a persistent correlation with the degree of philopatry exhibited by individual turtles. These results likely indicate that behavior syndromes have a meaningful relationship with philopatry in the ornate box turtle and should be continued to be explored in this species and others.

45

Consensual Nonmonogamy (CNM): Stigma, Relationship Satisfaction, and the Willingness to Engage in it

Svea Crohn

Mentor: Angela Duncan, Psychology

WTE

The purpose of this literature review is to understand the concept of Consensual Non-monogamy (CNM), the stigma around it, relationship satisfaction, and the willingness to engage in it. CNM is considered as an umbrella term for a variety of open relationships, that include polyamory, polygamy, and swinging (Sheff, 2020). As CNM is considered as a minority of relationship orientations, there is a lot of misconception around that topic, that influence the perception of CNM and therefore affects individuals who engage in it with stigma. This literature review intends to bring light into that topic, reviews the underlying roots of stigma, talks about relationship satisfaction and discusses different motives that lead a person to engage in CNM.

46

Unlimited Amount of Art for EVERYONE

Amy Cheng

Mentor: Kristine Hart, Center for Community & Civic Engagement

WTE

There is no doubt that art is an important part of any well-rounded educational curriculum, but it is not always accessible to everyone. During my time at Washburn, I have taken the skills gained from my studies in the Art Department and worked with two organizations that make art both accessible and fun with the intent to instill a lifelong love of art in those they touch: the Mulvane Art Museum and University Child Development. This presentation will focus on the impact of art programming on the local community.

47

Growing Through Play at the Kansas Children's Discovery Center

Sophia Frick

Mentor: Kristine Hart, Center for Community & Civic Engagement

WTE

The Kansas Children's Discovery Center offers children and families a safe place to explore and learn through play. The Discovery Center has several indoor and outdoor exhibits that allow children hands-on experiences, encourages creativity, and inspires learning. The Café is one of many exhibits and simulates the experience of a kitchen to teach children about food. As an intern with the Discovery Center, I was tasked with the challenge to update this exhibit, diversify the experience, and support new learning outcomes. I focused on the benefits of eating local and investigated ways to demonstrate how plants make it to our plates. I hoped to emphasize the growing process, introduce healthy lifestyle choices, and promote sustainable living. In this presentation, I will further explain my research process, potential learning outcomes, and suggested additions to the Café.

48

Helping Young Minds Learn Literacy at Boys & Girls Clubs of Topeka

Chartell Grissom

Mentor: Kristine Hart, Center for Community & Civic Engagement

WTE

In the Spring of 2019, I started my community engagement work with the Boys & Girls Clubs of Topeka. Shortly after I started, my position changed from a Youth Development Leader (YDL) to a Literacy Innovator (also referred to as a YDL 3). As a Literacy Innovator I assisted youth in a program titled KidzLit. I was tasked, amongst other duties, with conducting pre-tests and post-tests for the members. This helped us assess our members' literacy skills prior to beginning the literacy program and upon completion of the program. Unfortunately, there was a lack of engagement and interest in the program from our youth. Therefore, along with my supervisor, I was instructed to revamp the way KidzLit was being taught throughout the 14 club sites. Over a 2-year period I helped improve our literacy program to make it more enjoyable and insightful for our club members. Additionally, we equipped our staff with facilitation skills that fostered an environment conducive to member engagement. This presentation will detail the steps taken to present a revitalized program to our members and staff club-wide with an emphasis on my role in the process.

Identification and Analysis of Genomic Elements in Drosophila bipectinata Using Computational Genomic Tools

Simran Shrestha

Mentor: Takrima Sadikot, Biology

WTE

The genome of *Drosophila melanogaster* has been a highly studied genome in biology since the genome was completed in 2000. This organism is a model for studying development and cellular processes common to higher eukaryotes and can be used as a reference for identifying genes and genomic elements in other *Drosophila* species. In this project the *D. melanogaster* genome was used as a reference to analyze and annotate genes and genomic elements in contig70 of the related *D. bipectinata* species. The data files and resources for this project was obtained through the Genomic Education Partnership (GEP) sponsored by Washington University, Saint Louis. The analysis of contig70 of the *Drosophila bipectinata* genome determined the presence of five genes homologous with genes Best2, CG10163, CG10226, Ldh and Mdr65 of *D. melanogaster*. Incomplete genes or non-consensus genes were not found within this contig.

Reception

Brazil Menu

Brazilian Cheese Bread

Chili Cumin Chicken Kebabs

Churrasco Beef Skewers with Chimichurri Sauce

Churrasco Vegetable Skewer with gluten free Chimichurri Sauce

Brigadeiro

Non-Alcoholic Caipirinha



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