Exploration is what we do when we don't know what we're doing. The crux of human discovery and ingenuity is the drive to seek out what we do not know about the world around us. This year Davis’ talented undergraduates provide insights into the difficult question of how we fit within our own communities. Examinations of Wiccan practices and their evolution provide a window into an often overlooked community, while the study of the supreme court decisions on Christian symbols provides a new perspective on an otherwise well-known faction. Analysis of residential subdivisions like our own Cannery demonstrate a desire to escape from city life, the examination of Facebook vs. LinkedIn illustrates our interest in remaining a part of the city. Broader investigations into governmental reconstruction in the Philippines and sustainable agriculture in Vietnam help connect us with our broader global community. Finally, studies on the environmental impact of the drug war in central and South America, and the acidification of our ocean demonstrate our impact on the global climate, while an enhanced sol-gel composite offers a solution to the environmental issues we face.

I am grateful to the student authors and their mentors; to Dean Tantillo for his beautiful preface; to our excellent graduate and undergraduate editors Lauren Fink, Abbie Popa, Ashley Royston, Griselda Jarquin, Haley Cynar, Jordyn May, Lynn Huynh, Neha Venkatesh, Jaime Napan, Anna Gillet for their dedication and hard work; and to the Undergraduate Research Center and Tammy Hoyer for their tireless work.

The journal can be found at: Explorations.ucdavis.edu

We hope you enjoy it.

Brandon Tautges
Editor-in-Chief

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Government Reconstruction As An Initial Effort To Create A Favorable National Aesthetics For The Philippines
Written By Alaina Cagalingan, Ogee Fairy Erana, And Ralph Imatong
When I think of my current research and the path that led me to the problems being studied in my research group, the conceptual cliché that comes to mind is that of the fork in the road. Not the classic “I have a choice between two options—I hope I make the right choice and don’t mess up my life” scenario, but rather the “I’m wandering around, bump into a tree and fall to one side” scenario. In short, my career provides evidence that one can succeed in research without extensive planning, without career micromanagement, without fretting so much about which option is the “right” option. I am not against planning—I certainly do plenty—but I advocate for a roughly equal balance between planning and worryless wandering. That is what I recommend to the students in my lab who want to pursue careers in research, the sort of research you will find described in the pages of Explorations (presented here without descriptions of the winding paths that led to the conception of the projects and results described).

A personal issue with forks in the road…I have a bad habit. When I’m driving along and come to an unexpected fork in the road I tend to freeze with indecision and then, almost unfailingly, choose the wrong direction. Why does this happen? I think it is a result of my compulsion to try to figure out the right answer. But I’ve learned over the years that sometimes one can think too much. I’ve also learned that the consequences of “wrong” decisions vary in magnitude and sometimes are positive!

A more consequential example…I became a theoretical/computational chemist by accident. I went to graduate school to become an experimental organometallic chemist. Sounds fun, right? It wasn’t. Luckily, a friend of a friend suggested I look into computational chemistry. And luckily, one of the world’s best computational organic chemists was a faculty member in my department. I changed research groups and my career plans changed. I had accidentally found research that I loved and I wanted to pursue as a career.

A more recent example…I became a natural products chemist by accident. I spent the first decade of my independent career using quantum chemistry to probe the mechanisms of organic chemical reactions. Which reactions? Reactions that my students and I found interesting. Then one day I realized that most all of these reactions had to do with the synthesis—by chemists or by Nature—of complex naturally occurring molecules, “natural products.” I did not set out to become a natural products chemist. I did not design my “career identity,” I stumbled into it by following my interests.

A molecular example…My students and I currently study molecules that can transform into one of two different molecules by way of pathways that bifurcate. Which new molecule is formed is determined by the manner in which a given molecule vibrates, which is associated with an element of randomness. It’s like the time I walked down a path into the Grand Canyon. Eventually I came to a spot where the path fell off on either side—a ridge. I stopped and turned back (I wasn’t very brave at the time…actually, I’m still not). If, however, I was running down the path, wiggling from side to side, I would have fallen over the edge on one side or the other depending on the nature of my wiggle—a not so happy accident. That’s how I think about molecules traversing bifurcating pathways—they stumble toward one or the other product.

Am I just accident prone? Yes. Is that a bad thing? Usually not. There is an element of randomness in life—the life of a person and the “life” of a molecule. Molecules cannot choose how to take advantage of accidents, but people can. So focus, but look up from time to time, and look around so happy accidents don’t go to waste!
Abracadabra And Process Thought: Realizing Magick In Feminist Wicca
Deyu Wang

Between 1960 and 1980, America’s mainstream society considered magic as a combination of supernatural nonsense, themes of entertainment, and an umbrella word to describe indescribable events. However, Wicca, the counter-cultural Pagan religion, adopted the word as a form of resistance against a predominantly male-driven culture. By transforming and inventing socially devalued words such as magic into magick, Wiccans attempted to salvage and validate their practices. This allowed Wiccans to create their culture within the society that rejected them, and provide new interpretations of magick, separate from mainstream definitions. For instance, the practice of spells such as abracadabra exemplified how new categorical inventions and interactive kinds could be used to reconstruct the idea of magic. Additionally, Constance Wise’s application of the metaphysical philosophy of process thought demonstrated the reconstruction and invention of magick into a paradoxically new concept founded on old traditions. Feminist Wiccan subgroups adopted these new values and established new symbols from pre-existing traditions in order to further sociopolitical goals, particularly in respect to gender equality. From these instances, magick served as a tool and mediator for Feminist Wiccans against their social environment.

Drug Wars In Latin America: The Environmental Impacts
Marissa Ayala

The history of Inter-American relations involves frequent United States intervention into Latin American political affairs. This paper explores the history of the drug trade between Latin American and the United States, the failure of both local and United States policy to address drug production and trafficking operations, and the detriment to the natural environment of Latin America as a result. In addition, the paper details the similarities between United States policies in other regions of the world, with particular attention to poppy production in rural Afghanistan. Lastly it explores potential solutions to the worsening crisis of drug production and trafficking between Latin America and the United States.

Facebook Versus Linkedin: The Personal And Professional Faces Of Social Media And Its Relevance To Job Search
Natalie Nguyen

In 2014, job seekers between the ages of 18 and 29 were the largest group of individuals using social media. Though young job seekers use social media to share their personal stories and develop a professional image to appear as attractive job candidates to recruiters, these efforts may not work as intended and can cause a boomerang effect in the job search. Moreover, social media users are unfortunately unaware of what cues they are expressing on their profiles that can cause negative feedback. To explore this paradox, this literature review compares research regarding various instances in which different cues worked as intended or backfired in the impression formation process. The two forms of social media that will be examined are: Facebook and LinkedIn. Although it is advantageous to have social...
media as an asynchronous channel to perfectly craft an impression, recruiters may misinterpret cues (or lack thereof) presented by users and/or their networks. These findings, along with understanding the perspective of the hyperpersonal and lens models, can assist social media users in achieving their goals of landing a job by enhancing our knowledge of how people express and (mis)perceive social media information.

**No Other Gods Before Me:**
**The Supreme Court, Public Opinion, And The 10 Commandments**
*Ryan Cannon*

Over the past three decades, scholarship regarding the effect of Supreme Court decisions on public opinion has produced several working hypotheses. One in particular, the “structural response hypothesis,” predicts that when the Court rules on issues in opposition to public opinion, support for or against the issue will polarize. To test this hypothesis, changes in opinion on six individual characteristic levels were measured prior to and after the release of two Supreme Court decisions regarding the public display of religious symbols. Contrary to the results predicted using the “structural response hypothesis,” analysis of changes within groups did not show increases in polarization. Many groups showed a decrease in strong support or strong opposition to the public display of religious symbols, with increases in moderated positions. This raises some doubts as to the Court’s ability to affect public opinion, as well as the validity of the “structural response hypothesis.”

**Immune System Impacts of Global Climate Change and Ocean Acidification Conditions in two Ecologically Critical Echinoderms**
*Kelsey Craig*

Biomarkers of immune suppression were investigated after acute exposure of *Pisaster ochraceus* (ochre sea star) and *Strongylocentrotus purpuratus* (purple sea urchin) to projected seawater temperature (19°C) and pH for global climate change conditions in the year 2100. In *P. ochraceus*, a decrease in seawater pH by 0.4 units resulted in a 66.6% reduction in coelomic fluid average total coelomocyte count (p = 0.027) after 72 hours of exposure. No statistically significant changes were observed for *S. purpuratus*. The results support previous research suggesting that species-specific differences in tissue bicarbonate buffering capacity may explain observed differences in sensitivity. Progression of SSWD symptoms in *P. ochraceus* during the acute exposure period of the experiment is consistent with previous research suggesting that SSWD prevalence is strongly associated with warmer temperatures. Potential ecological consequences of global climate change conditions requires further research into potential impacts of near-future ocean conditions.

**Towards Enhanced Photochemical Water Splitting through Bacteriorhodopsin/TiO₂ Sol-gel Composite**
*Yue Deng*

Titanium dioxide (TiO₂) is widely known for its photocatalyst nature under UV light. Bacteriorhodopsin, a protein that conducts protons and electrons under visible light, makes TiO₂ a photocatalyst under visible light by increasing the light band gap of TiO₂. Ideally, this Bacteriorhodopsin/TiO₂ sol-gel composite can be used to produce hydrogen gas under sunlight with high efficiency. However, in order to combine bacteriorhodopsin into TiO₂ sol-gel, the gel and bacteriorhodopsin needs to have high bio-compatibility. Alcohol, which can alter protein’s shape, needs to be eliminated from the TiO₂ sol-gel making...
process to prevent denaturing. A new method to prepare TiO$_2$ sol-gel from a titanium precursor (titanium ethoxide in this paper) at high water concentration (70 vol% - 100 vol%) was developed. The photocatalytic behavior of the TiO$_2$ sol-gels with low alcohol concentration was then confirmed under UV light through spectrum scans after dying the sol-gel with methylene blue.

**Life Tastes Better Here**

*Louisa Brandt*

Residential subdivisions in the United States, from famed landscape architect Frederick Law Olmstead's bucolic enclaves of the 19th century through Levittown's mass produced suburb designed for young post-World War II families, have all appealed to providing people with an escape from city life. At times, subdivisions also aspire to create a community of like-minded individuals based on a theme devised by the developer. One such example is 1960s Foster City in San Mateo County, in which boating was a theme with some houses built around manmade lagoons. At this very moment, The New Home Company is creating a farm-themed residential development in our home city of Davis. It is called The Cannery, and it includes its own working farm. While the promotional material and model homes promise a pastoral setting akin to those espoused by Andrew Jackson Downing and his followers, looking closer, one discovers that The Cannery will never live up to either its 19th century antecedents or its 21st century publicity.

**Sustainable Agriculture and its National Aesthetic Potential for Vietnam**

*Ryan Tom and Andrew Tom*

The rapid economic transformation and urbanization of Vietnam presents opportunities for the development of a sustainable national identity. Vietnamese sustainability can, and should, emphasize socioeconomic independence, environmental stewardship, and reinforcing cultural values. Using a National Aesthetics framework to expand these ideals, we investigate potential manifestations in the cities of Da Nang and Da Lat. Drawing from examples of successful case studies, we argue that a strategic implementation of this national aesthetic would mobilize communities around a new national image sparking economic growth and strengthening the reception of Vietnamese exports into the future.
Government Reconstruction as an Initial Effort to Create A Favorable National Aesthetics for the Philippines
Written by Alaina Cagalingan, Ogee Fairy Erana, and Ralph Imatong

The Philippines continues to be a developing country primarily due to its prevalent internal struggles such as corruption, mismanagement of resources, and inadequate economical use of people through labor exportation. Using the National Aesthetics framework, which requires the government, the people, and the industry to work together to produce a successful (re)branding, we examined the Philippine government and its leaders for their roles in the nation’s stagnating economy. We argue that for the Philippines to successfully present a favorable national aesthetic internationally and domestically, corruption in the Philippine government must be first resolved. The resolution for this dilemma involves the participation of its people and the industry. This article proposes a series of plans that will help instill reformation in two decades which ideally will resolve corruption within the government.

COVER IMAGE:
By: Kendra Moore

Taken on my trip to the island of Inishmore in Ireland, this photograph captures the beauty and simplicity of the island and its people. The nine miles of land are a bastion of traditional Irish culture and Gaelic language. With one sleepy village and more bikes than cars, it is not uncommon to see horse drawn carriages and farmers walking in the middle of the road with their cows. As I was biking around the island, I came upon this man and his cows. In the moment, I realized something that seemed so out of the ordinary to me was probably just another everyday activity for him. This is exploration, the opportunity to discover a culture so different from my own. As I was riding my bike, I reached for my camera to capture the moment, expecting a blurry picture, but one that would remind me of Inishmore and its people. Going through my pictures later, I discovered this one. The picture does not even do it justice, but the still-wet-road from the unpredictable rain, the man and his cows, and the low-lying stone walls truly epitomize the Irish spirit. It immediately transported me back to the moment, reminding me of the appreciation for the culture and traditions the little island of Inishmore evokes. While it is very much a popular day trip for tourists, the preservation of the Irish traditions make it a special place where it is possible to take a step back in history for a brief moment and explore a way of life that would otherwise seem so foreign.

Kendra Moore is a sophomore majoring in Biomedical Engineering and minoring in Spanish. With her love for traveling and her dedication to becoming a more worldly global citizen, photography is a hobby that allows her to capture special moments from her trips and turn them into lasting memories.