

FALL/WINTER 2020

# M

## The Magazine of the Museum of Texas Tech University

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CROWN OF THORNS

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WHEREABOUTS AND HIDEOUTS:  
THE ARTIST PRINTMAKER  
RESEARCH COLLECTION

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LINDA FISHER:  
FRIEND TO THE MUSEUM

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FACULTY OFFER THEORY FOR  
ORIGIN OF LIFE ON EARTH

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Texas Tech University  
Spring/Summer 2020

### Editors

Aaron Pan, Ph.D.

Laura Ray

Daniel Tyler, M.A.

### Editorial Committee

Lisa Bradley, M.S., Aaron Pan, Ph.D., Laura Ray,  
Daniel Tyler, M.A.

### Writers & Contributors

Lisa Bradley, M.S., Peter Briggs, Ph.D., Sankar  
Chatterjee, Ph.D., Taylor Ernst, M.A., Marian Ann  
Montgomery, Ph.D., Laura Ray, Megan Reel, M.A.,  
Daniel Tyler, M.A.

### Design

Armando Godinez Jr.

### ADMINISTRATION

#### Executive Director

Aaron Pan, Ph.D.

#### EXECUTIVE ADMINISTRATOR

##### Museum Association

Jouana Stravlo

### CONTACT US

[museum.texastech@ttu.edu](mailto:museum.texastech@ttu.edu)  
Museum of Texas Tech University  
3301 4th Street, Box 43191  
Lubbock, TX 79409

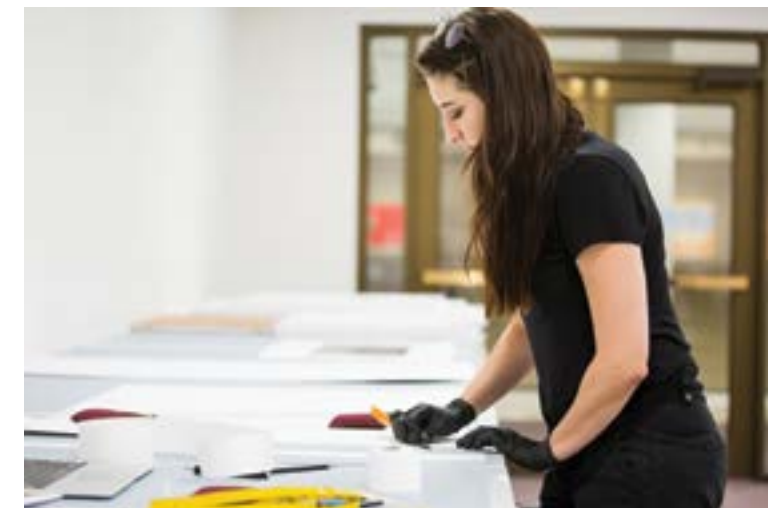


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#### Contact:

**Eileen Johnson, Ph.D.**

Chair, Horn Professor

806-834-5560

[eileen.johnson@ttu.edu](mailto:eileen.johnson@ttu.edu)

**Sally Y. Shelton, M.A.**

Associate Professor of Practice and

Associate Chair

806-834-6292

[Sally.Shelton@ttu.edu](mailto:Sally.Shelton@ttu.edu)

# CONTENTS

FALL/WINTER 2020



## DIVISIONS

- 07 M News
- 10 Staff Profile
- 12 Around the Museum
- 17 Closed But Contributing
- 42 Natural Science Research Laboratory
- 54 Alumni Profile
- 58 Museum Association Profile
- 60 Exploring Paleontology Holotypes
- 69 Upcoming Exhibitions

## FEATURES

**18 |** \_\_\_\_\_  
The Impact of COVID-19  
at the Museum

**26 |** \_\_\_\_\_  
Crown of Thorns

**30 |** \_\_\_\_\_  
Whereabouts and Hideouts

**36 |** \_\_\_\_\_  
Linda Fisher: Friend to the Museum  
of Texas Tech University

**48 |** \_\_\_\_\_  
Faculty Offer Novel Theory for Origin  
of Life on Earth

## MEDICI'S TREASURES

*A message from our new executive director*

In March of this year, I was given the distinct honor of being named executive director of the Museum of Texas Tech University. This privilege, along with my faculty appointment as an associate professor of practice, has been a lifelong dream and I thank Texas Tech University leadership, the Museum Association, faculty and staff of the museum, and all the museum's visitors and supporters for putting their trust in me.

My academic background includes a Bachelor of Arts in Creative Studies with a Biology Emphasis from the University of California Santa Barbara. UCSB's Creatives Studies program is wonderful and focused on taking over-eager undergraduates (chomping at the bits to conduct research) and allowing them to take upper division and graduate level courses even as freshmen and sophomores. I received my Doctorate of Philosophy in Geology, with an emphasis in paleobotany, from Southern Methodist University.

Throughout my career in museums, I have always tried to conduct some active research, even if it has sometimes been on a reduced scale or on weekends or during vacations - including receiving strange looks from beachcombers as I was photographing, video recording, and jotting down notes on the behavior of a remarkable endangered seaside yellow-faced bee on the Big Island of Hawaii. My research interests are broad and consist of understanding the floral composition of prehistoric East African forests, Müllerian mimicry within the vibrantly colored velvet ants, understanding the behavior and biogeography of rare and endangered bees, and figuring out the evolutionary relationships of abalone species.

While being an active researcher is an important and foundational part of my being, my most gratifying experiences have been in the museum setting as a curator and educator at the Fort Worth Museum of



*Executive Director Aaron D. Pan, Ph.D.*

Science and History and as the executive director of the Don Harrington Discovery Center in Amarillo, TX. Throughout my 12 years in the museum field, I have come away with the importance of museums. In regards to the community they serve, museums have four main roles: as caretakers, sharers, stimulators, and storytellers. Museums are caretakers, not only in the most obvious way as protectors and conservers of priceless art, artifacts, and specimens for the community and humanity at large, but also in terms of a community's history, aspirations, and reputation. Museums are also sharers. Collection loans to researchers and other institutions are pivotal activities that museums undertake, but it is just as important that museums provide open access to information and opportunities to examine physical items by the general public, the dissemination of research findings produced by museum curators and personnel, and in terms of partnerships with other museums in sharing best practices, resolving challenges, and cultivating camaraderie. Museums are also stimulators - they provide unique and innovative ways to reach and disseminate

# “MUSEUMS HAVE FOUR MAIN ROLES: AS CARETAKERS, SHARERS, STIMULATORS, AND STORYTELLERS.”

information and concepts to broad audiences, they create awe-inspiring experiences, and assist in the formation of exciting collaborative projects involving experts, artisans, educators, and volunteers. Last but certainly not least, museums are storytellers. Museum storytelling takes many forms including its exhibits and programs, lectures, and hands-on experiences. Storytelling is particularly vital because it is our best way to convey concepts, ideas, history, and to engage and inspire others. My greatest motivation to making sure a museum thrives is seeing the incredible dedication of the staff who bring the institution to life and the way their success is showcased by the ‘oohs and ahhs’ of school children, a packed auditorium during a lecture, a patron standing for several long minutes gazing at a painting, a visiting researcher excitedly discovering something in the collections, and the journal articles and publications of our staff’s work.

In accepting this new position, I recognize the important and delicate role the executive director plays. With 90 years of rich history, the museum has created a strong foundation with its six impressive and comprehensive collections, an exemplary and globally recognized museum science and heritage management master’s program, dynamic research, compelling exhibitions and educational programming, an incredible archeological educational and research facility at the Lubbock Lake Landmark, and the internationally recognized Natural Science Research Laboratory. We are also very fortunate to have an amazing association who are some of our strongest advocates

and supporters. As executive director, I will build upon these strengths and lead the museum forward through an updated strategic initiative, an increase in visitorship and reach, the continuance of strengthening community relationships, the development and implementation of additional wonderful programming for the public, growth of the museum’s standing on a national and international stage through support of our curators, their research, and the showcasing of their findings, building relationships and producing collaborative projects with TTU academic departments and other museum institutions, and increasing the museum’s funding. This strategic plan will be a collaborative effort, and I look forward to working together with the talented faculty and staff at the museum, the museum association, TTU leadership, personnel, and academic departments, and community members to make this vision a reality.

This museum, our museum, is a vital piece of the TTU and regional community, but it is also an important resource on national and international scales and this needs to be whole-heartedly conveyed – I am happy to be that earnest advocate. The art, history, science, and research that has been built over the past 90 years is incredible and I feel grateful to now play a part in its future. Growing up in the Panhandle, I have a clear understanding of the deep roots and spirit of West Texas. The relationships I have made make West Texas home and I value all that it has given me. In the coming months, my wife, three children, and myself look forward to getting to know the Lubbock community better.

It has been a unique and surreal experience to begin this new chapter in the wake of a global pandemic, but at the same time it provides us an opportunity on how we can be innovative in meeting the four roles of the museum in the future. Thank you, from the bottom of my heart, for giving me this opportunity to be a part the museum’s story and to make sure that it continues to be an important and inspirational read.

**Dr. Aaron D. Pan**

*Executive Director*

## M News



*Hyojung Cho, Ph.D.*

### FACULTY MEMBER RECEIVES FULBRIGHT SCHOLARSHIP

Supported by the Fulbright Scholar Program of the United States Department of State, I will be teaching heritage management in the Department of History at Boğaziçi University in Istanbul, Turkey for Spring semester of 2021. I have taught and studied heritage management in the Heritage and Museum Sciences Program at the Museum of Texas Tech University for 12 years and sought an opportunity to share my research and teaching expertise while also deepening my research interests in Turkey. The Boğaziçi University is a major research university and consistently ranks highest in Turkey, and I feel privileged this prestigious institution agreed to support me as a host institution. The department offers extensive courses on Turkish and world history and operates specialized research facilities, such as Asian Studies Center and the Research Center for Archeology and Architectural History. However, the department does not offer any course on heritage management despite its studies and projects deeply associated with heritage management. In fact, heritage management is still a new discipline which offers many possibilities and areas for discovery.

The course I am teaching is US heritage management: history, policy, and practices. The class will examine the theory, philosophy, and management aspects of heritage resources. Important issues in heritage management will be approached in light of political, historic, and social reasoning and purposes. Comparative study of centralized East Asian heritage management systems

will allow students to observe the limitations in the US system, but also its uniqueness and innovative policy developments for heritage management. The class will negate the shortcomings of conventional Eurocentric approaches to heritage and critically explore the policy, political dynamics, and practices of heritage management in the US context in conjunction with international non-governmental organizations and Asian countries.

The Fulbright scholarship is, to me, the exchange of values and inspiration through sharing expertise and knowledge. Therefore, I am especially looking forward to the learning opportunities from communication with students and scholars at Boğaziçi University and from research of heritage resources in Turkey. In a geographically strategic location between Europe and Asia, Turkey has been the crossroads of many civilizations, ancient Greek, Persian, Roman, Byzantine, and Ottoman empires. As of 2019, there are 18 UNESCO World Heritage sites in Turkey, and there has been an active development of museums. Studying Turkish heritage will be of great benefit to understanding the decisions and controversies over cultural heritage across Europe. In addition, as Turkey is one of the world’s top 10 destination countries in heritage tourism, I plan to study the site management in balancing conservation and tourism, and learn about Turkish government’s initiatives, including the recently announced Turkish culinary tourism project.

Studying Turkish cultural heritage in Istanbul, the heart of the nation’s history and culture, will be an immeasurably valuable experience as a scholar in the heritage management field. The experience will undoubtedly be beneficial for my future research and teaching, which I will bring to my students and the field.

- Dr. Hyojung Cho, Associate Professor

### EXHIBITION TAKES TOP AWARD

*Cotton and Thrift: Feed Sacks and the Fabric of American Households* won the 2020 Wilder Award from the Texas Association of Museums. The award is the highest achievement in the Books and Catalogues category. The Cotton and Thrift exhibition showed June 2019 through December 2019 and Clothing and Textiles Curator Marian Ann Montgomery, Ph.D. curated both the book and exhibition. To order your own copy of the book, please visit our website: <http://www.depts.ttu.edu/museumttu/collections/clothing-textiles/index.php>



*Book cover*

**TTU STUDENTS WIN PRESENTATION AWARDS AT REGIONAL MAMMALOGY MEETING**

The 38th Annual Meeting of the Texas Society of Mammalogists was held February 21-23, 2020, at the Texas Tech University Center at Junction. The meeting was attended by 149 members (92 of which were students) from 7 states and 36 institutions.

The Natural Science Research Laboratory, Department of Biological Sciences, and Department of Natural Resources Management of Texas Tech University were well-represented by their graduate and undergraduate students at this meeting.

Of 20 oral presentations, TTU students presented six. Emma Kunkel won the Robert L. Packard Award, which is presented for the Best Overall oral presentation by a graduate or undergraduate student. In August 2020, Emma obtained her Master of Science degree in Biology under the direction of Liam McGuire (former Professor of Biology and a faculty associate of the Natural Science Research Laboratory). Her thesis title was “Ecology and Energetics of Partial Migration and Facultative Hibernation of Mexican Free-tailed Bats.”

Of 40 poster presentations, TTU students presented thirteen. Sarah Vrla won the Clyde Jones Award for the best poster presentation by a graduate student in mammalian molecular biology, evolution, and systematics. Sarah is a current Ph.D. student of Robert D. Bradley (Professor of Biological Sciences and Director of the Natural Science Research Laboratory).



Emma L. Kunkel receives the Robert Packard Award



Sarah C. Vrla receives the Clyde Jones Award

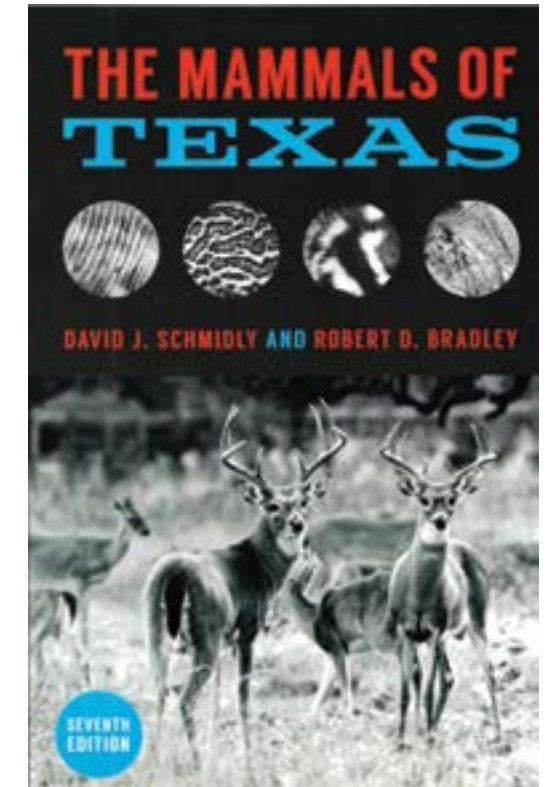
**NSRL WEBSITE GETS A NEW LOOK AND A NEW ADDRESS!**

*Updates include access to the 2016 edition of The Mammals of Texas*

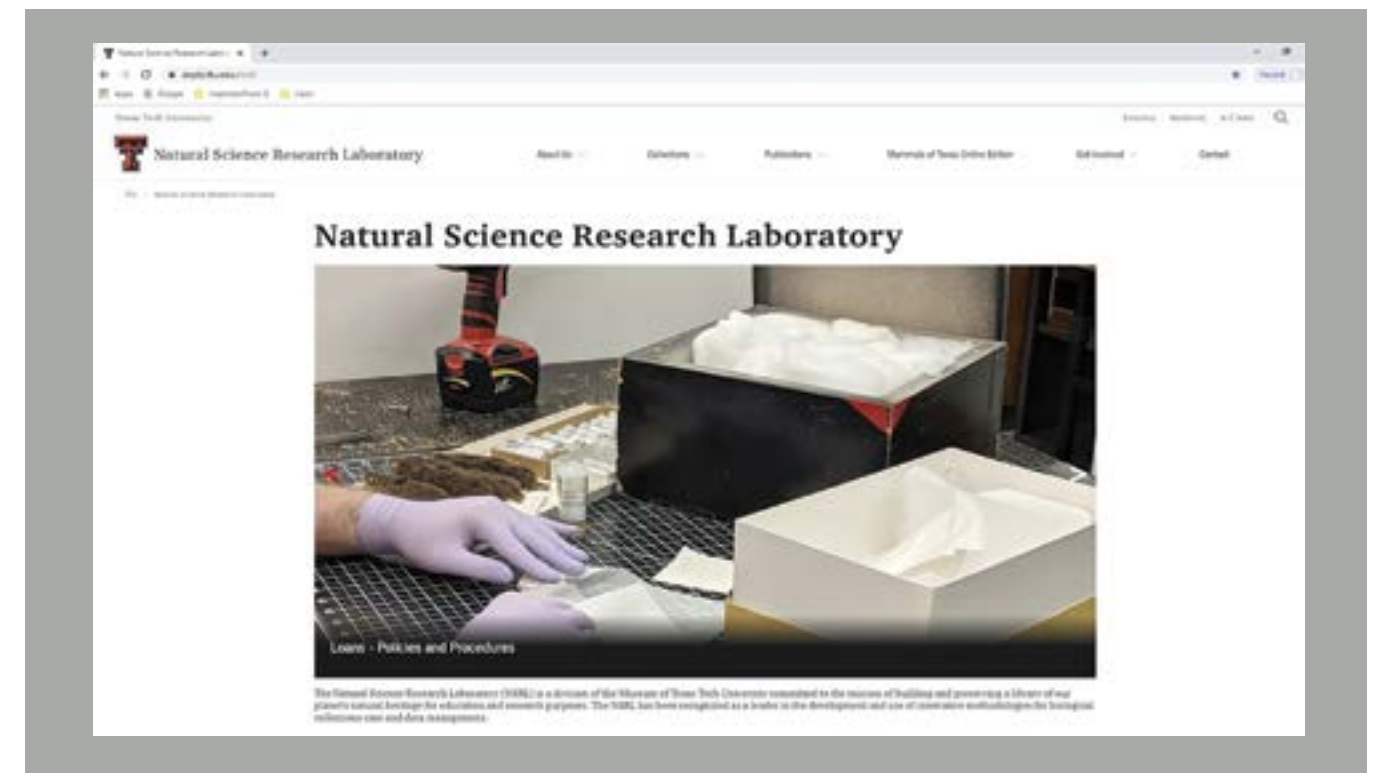
The Natural Science Research Laboratory unveiled its new website, which brings the style and layout of the website in line with Texas Tech University standards. The NSRL website can be accessed at its new URL address: [depts.ttu.edu/nsrl](http://depts.ttu.edu/nsrl).

A major feature of the new website is access to the digital version of the 7th edition (2016) of *The Mammals of Texas*, authored by David J. Schmidly and NSRL Director Robert D. Bradley. This online edition is provided to the public courtesy of a cooperative agreement between the NSRL, the authors, the Texas Parks and Wildlife Department, and the University of Texas Press. The print edition of this valuable reference book is available for purchase from the website of UT Press at [utpress.utexas.edu](http://utpress.utexas.edu).

We encourage you to bookmark the new URL and visit the NSRL website often for access to *The Mammals of Texas*, the Vertebrate Database, free PDFs of our publication series *Occasional Papers* and *Special Publications*, the latest information about the research and curatorial activities of the NSRL, and more.



Book cover



<http://www.depts.ttu.edu/nsrl/>

# STAFF PROFILE

## LARRY BURKS

*Operations Manager,  
Museum of Texas Tech University*



### **How long have you been here?**

I began my position at the Museum on November 16, 2019.

### **What do you do as operations manager at the museum?**

I am still learning all of the ins and outs, but overall I am in charge of all maintenance at the museum. I direct the custodial and security crews, and take care of any repairs and upkeep issues. I assist with keys or access requests, handle facility rentals and upgrades, and coordinate and implement any special requests or projects from other departments within the museum.

### **How long have you worked at TTU?**

20 years. I started in Physical Plant in Maintenance Office where I worked for 11 years. I then moved to the Student Union Building as operations superintendent for nine years. Before my time at Texas Tech I spent 20 years in the Air Force.

### **What have you enjoyed most about working at the museum?**

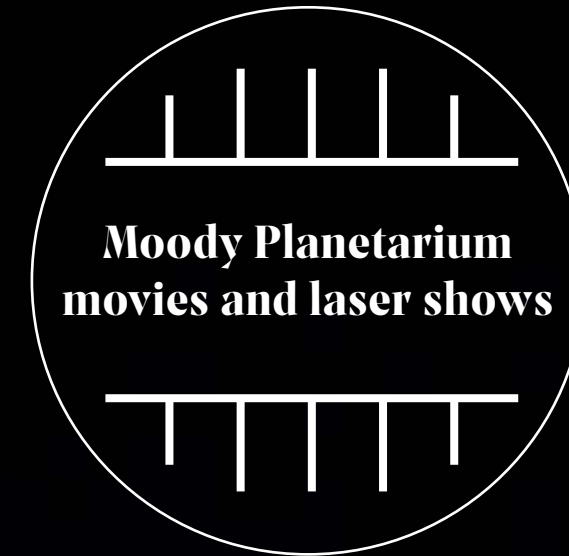
I have really liked being able to learn while at work. Every day I am surrounded by history and artifacts and it has been fun and interesting. I have also enjoyed meeting new people.

### **Has anything surprised you about this job?**

I didn't realize all of detail that goes into running a museum and the extent of all of the processes that take place. It's also been interesting to learn how much value artifacts have.

### **What do museums mean to you?**

Museums are a way to save and share history. I am a big history person and really enjoy that aspect of museums. It is pretty neat that I get to work at a museum and hopefully I can contribute and make a difference for the next 10 or so years.



<http://www.depts.ttu.edu/museumttu/visit/planetarium.php>



# AROUND THE MUSEUM

## PLANETARIUM RECEIVES A NEW LOOK

At the beginning of 2020 (and two years in the making) the Moody Planetarium closed to get a new look. The planetarium's front counter was completely removed and replaced with a fresh new layout that provides much needed storage and space and includes a brand new counter. The planetarium also received new signage to hang on the wall behind the counter to complete the space. The electrical components were also completely redone. The construction was near completion before COVID-19 shut everything down. The planetarium looks forward to showing off the beautiful new space when the museum reopens.

*Please note: Out of an abundance of caution, the planetarium will remain closed in the event the museum reopens until it is deemed safe. Thank you for your patience as we navigate these strange times.*



*New Moody Planetarium counter*

*We are grateful to The CH Foundation for their generous support in making this remodel possible.*

## AVERTED DISASTER: QUICK THINKING AND RESPONSE TO MINOR EMERGENCY AT THE MUSEUM

by Rachel Gruszka, Collections Manager – Anthropology, and Eileen Johnson, Ph.D., Curator of Anthropology

For museums, few nightmares are worse than a flood in a collections storage area. Water can cause irreparable damage to objects and documents. On Monday, November 25th, 2019, this worst-case scenario became a reality. Fortunately, this worst-case scenario was turned into a best-case scenario through the efforts of the Anthropology Division staff and students, standard practices employed by the division, and great teamwork from other museum staff and students.

Sometime over the weekend prior to November 25th, a water fountain in the Museum's Sculpture Court malfunctioned and the steady drip of water over several days led to a significant accumulation of water in the room directly below it. The room below was the anthropology division's temporary holding room for collections generated by the Lubbock Lake Landmark's regional research program waiting to be installed in the division's permanent collections. With a collection of 3.5 million objects and a small staff, collections cannot always be installed immediately and are kept organized in a dedicated room in preparation for installation. Objects and documentation were placed in archival boxes, barcoded, and stacked in rows.

Monday morning, museum operations staff discovered the leak and alerted anthropology division collections staff and after realizing the extent of the flooding, the anthropology division staff immediately began removing at-risk boxes from the storage room. Students from the Heritage and Museum Sciences Collections Management class were in the anthropology division that morning working on a class project and were quickly pulled from the class to help move boxes out of the storage room. While unexpected, this



*Figure 1. Staff and students from all over the Museum line up to help remove boxes from the room, while others carry boxes out.*

new assignment gave the students an excellent, first-hand learning experience in disaster recovery, a valuable lesson to use in their future professional careers.

As boxes came out of the flooded room, more staff and students came to help (Figure 1). Additional operations staff and personnel from the paleontology division assisted and soon after, staff and students from art, exhibits, and education divisions joined as well. Their efforts helped remove all at-risk boxes quickly and efficiently, reducing any potential damage to the objects. Once the immediate risk was eliminated, staff and students from anthropology and art divisions began to assess the damage. Of the 200 boxes that were removed from the room, approximately 70 had sustained some level of water damage ranging from complete destruction to a few minor water spots on the exterior (Figure 2). Miraculously, with nearly

191,000 objects removed from the room, only eight (0.004%) were wet and/or damaged.

This incredibly low damage rate truly was a best-case scenario and is an exemplary example of the Landmark's and anthropology division's commitment

to best practices. All objects were packaged with tissue, to provide padding and prevent damage, and placed in sealed bags. Fragile objects received additional custom packaging to reduce risk of damage. While in temporary storage at the Landmark, bagged objects were organized together and grouped in additional sealed bags. Once inventoried, these bags, then, were placed in standard size archival boxes and the boxes barcoded. The boxes that stored the objects provided a layer of protection. The multiple-bag system helped keep objects dry in the flood. While many boxes were destroyed and had to be replaced, they served their purpose by keeping the objects inside dry and safe.

Recovery from the flood occurred in phases. First, dry and wet boxes were separated. A priority system was established for the wet boxes, with those most saturated emptied first, and those of least concern emptied last. The contents of the emptied boxes were checked for moisture and if everything was dry, they were moved to new boxes (Figure 3). The wet and damaged objects were identified, dried, photographed,



*Figure 2. Boxes removed from the flooded room, demonstrating varying degrees of water damage.*

and condition reports completed that detailed the damage that occurred. At the end of the recovery process, to account for all objects, a complete inventory was conducted of all the contents within all of the boxes that were moved, whether or not they had sustained any water damage. That inventory then was compared with the original box inventories to account for all objects.

The boxes also held paperwork, including original field documentation and catalog sheets. Of the documents, the catalog sheets sustained the brunt of the water damage, with many too wet to salvage. Luckily, catalog sheets are generated from the division's databases and were easily reprinted on acid-free paper. Meanwhile, the field documentation that is irreplaceable escaped almost completely dry. A few object slips, documentation that accompanies each individual object recovered in the field, were wet to slightly damp. These slips were laid out on acid-free buffered tissue paper to air dry for several days, and were salvaged. It was fortunate that the only paperwork that was destroyed was the paperwork that was replaceable.



Figure 3a. Heritage and Museum Sciences students check packaging for moisture. Normally, objects are handled using gloves. In this unique situation, students are using clean hands to make sure the tissue paper around the objects is dry.

The flooding has led to some changes in the anthropology division's procedures. All documentation now is installed in the division's documents room immediately after entering the museum, even if the objects from the corresponding collections are not ready to be installed. The documents room has no pipes in it other than the sprinkler system that is part of the emergency fire-suppression system, thus providing a low-risk storage environment. The packaging methods employed by the Landmark and division demonstrated that the care provided to its collections keeps the objects safe in an emergency situation, and, therefore, objects still could be placed safely in the division's temporary storage room in the archival boxes.

In the end, while a localized disaster did occur, the outcome was a best-case scenario. No irreplaceable documentation was lost, the documentation that was damaged was replaced, no objects were lost, and the damage to objects that did occur was minor. The incident was a good learning opportunity for the

students in Heritage and Museum Sciences, and a good test to see how well the museum staff responds in a collections-based emergency situation. The quick response and the outpouring of help from throughout the building demonstrated that should the worst happen – and we hope it never does – the museum is ready.



Figure 3b. New boxes, holding dry contents recovered from water-damaged boxes, line the wall on the right, while staff and students continue working on the remaining wet boxes.



## INTERACTIVE "DINO CART" CREATED FOR LOCAL ELEMENTARY

In early 2019, Curator of Education Jill Hoffman, Ph.D., built a "Dino Cart" after receiving a request from Cooper Elementary. The STEM coordinator wanted to know if the museum could provide a few items for the kids to look at. The Dino Cart is interactive, educational, and touchable, which allows students to experience a piece of the museum within their school walls. A similar cart can be built for travel to other schools. If interested in having such a cart visit your school, please email [jill.hoffman@ttu.edu](mailto:jill.hoffman@ttu.edu).

## EDUCATION DIVISION DOES COMMUNITY OUTREACH

A major focus of the Museum of Texas Tech University's Education Division is to provide visitors of all ages with opportunities to have enriching experiences while attending the museum's public programs. However, the goal of providing these experiences is not limited to programming solely within the walls of the museum, but also focuses on providing programming to the public through outreach opportunities allowing for museum experiences to be brought directly to them.



The museum Education Program Coordinator, Danielle Marshall demonstrates the Native American Weaving Activity through a live-streaming camera overhead. Photo courtesy of Covenant Children's Hospital.

Over the years, the museum has created some lasting relationships with organizations throughout the greater Lubbock community and surrounding regions. Equally as important as maintaining previously established relationships, is a focus towards creating new community partnerships. The most recently created partnership initiated by the museum Education Division has been with Lubbock Covenant Children's Hospital, in the hospital's Child and Family Integrative Care Department. "The mission of the Department of Integrative Care is to provide developmental, educational, and expressive opportunities through play and the creative arts to help our children and



families better cope with illness, hospitalization and recovery.” (Covenantchildrens.org) This department provides uplifting opportunities for patients and their families to participate in activities that allow for a ‘temporary break’ of sorts, from the high stresses related to being a patient within the hospital.

Covenant Children’s has established an ingenious way of delivering these Integrative Care programs to their patients using an activity room in conjunction with a closed-circuit television (CCTV) system throughout the unit. This system allows for flexibility in participation for the patients, some of whom are unable to attend the program sessions. The recently redesigned activity space has a newly installed camera system in the room that allows for various types of activities to be streamed to TVs in each hospital room, allowing children to participate in events from the comfort of their own room. The children are also able to watch streamed event sessions at a later time depending on how they are feeling or scheduled treatment sessions in other areas of the hospital.

The first of these outreach events at the hospital involved learning about Native American weaving processes and techniques along with a basket weaving craft. Before the session went live, nurses were given pre-packaged activity materials provided by the museum to pass out directly to the rooms of the patients who chose to participate while in their rooms. The supplies included pre-made basket weaving bases with attached string. Once the materials were passed out and the camera began to live stream the event, I demonstrated the weaving pattern while explaining the process as patients were able to both see and hear the explanation of the weaving process. In this way, patients were able to both see and hear the explanation of the weaving process while they created their own baskets. As they continued to weave, I would pause the weaving demonstration to show them items from the education division’s teaching collection and shared facts about the collection items that coincided with the theme of Native American weaving.

After the outreach session was over, we received extremely positive feedback from the Covenant team and our organizations both agreed that this would be an ongoing partnership for the future. This newly created outreach partnership allows patients within the Covenant Children’s Hospital to participate in activities that are not only educational and entertaining, but that hopefully also provide a bit of temporary levity to their daily hospital routines. It is imperative that when creating outreach opportunities museums must keep in mind how their programming can be inclusive to members of the community that for many reasons, may not be able to make an in-person trip to the museum.



## CLOSED BUT CONTRIBUTING TO COMMUNITY

by **Rachel Gruszka**, Collections Manager – Anthropology, and **Dr. Eileen Johnson**, Director of Academic and Curatorial Programs



33,250 gloves from the museum were donated to Texas Tech University Health Sciences Center.

When Texas Tech University moved to Phase IV operations in response to the COVID-19 outbreak, the Office of the Vice President of Research and Innovation put out a call to the Tech community for Personal Protective Equipment (PPE), such as gloves and masks. The Museum of Texas Tech University, Natural Science Research Laboratory (NSRL), and the Lubbock Lake Landmark (LLL) answered that call.

While it may seem surprising that a museum could contribute supplies to the medical community, gloves are standard practice of museum staff to use while handling objects to prevent the transfer of oils from their hands to the objects. This is a simple procedure that helps to preserve the objects for the future. While white cotton gloves are still in use in some circumstances, most museums now use disposable powder-free nitrile gloves for most purposes. Cotton gloves are permeable and if worn too long, can build up oil

from the wearer’s hands. Additionally, some hazards come from the collections themselves, such as old taxidermy mounts that may have been treated with arsenic or poison-tipped arrows in ethnological collections. Cotton gloves provide no protection to staff in these situations, while impenetrable nitrile does.

With the museum, NSRL, and the LLL closed during University Phase IV operations, gloves and other PPE were not being used. When concerns about medical professionals running out of necessary PPE became prevalent in the news the staff were eager to do what they could to support the community and its dedicated medical professionals during this time of need.

Combined, the museum, NSRL, and LLL collected 167 boxes (16,625 pairs/33,250 total) of gloves (Figure 1). Additionally, approximately 75 masks,

including N95 masks, 2 sets of eye protection, and 50 disposable plastic aprons were part of the donation. These critical supplies were donated to the Texas Tech University Health Sciences Center (TTUHSC). As a whole, Texas Tech University donated over 107,000 gloves to TTUHSC. With 33,250 of those gloves coming from the museum, the museum’s contribution was around 31% of the gloves collected!

In a time of crisis, communities came together in amazing ways and often found unexpected but meaningful ways to contribute. The Lubbock community was no different, and the museum, NSRL, and LLL were pleased to be a part of an effort to support our community and help our critical medical staff.

# *THE* **IMPACT** OF COVID-19 *AT THE* *MUSEUM*

**O**n March 17, the museum received the directive from Texas Tech University leadership to close to the public and shut down completely due to the COVID-19 pandemic. This meant that all faculty, staff, and students were sent home indefinitely. Some personnel were able to work from home, while others had their work schedules significantly reduced. These strange times brought challenges to many of us while also allowing us to pause, refocus, and create new opportunities. The museum is made up of many divisions and departments that work together to create impactful cultural experiences for everyone. Our plan is to continue and build this effort while showing the strength and relationships of our museum and community.



**NANCY E. MCINTYRE, PH.D.**

Curator of Birds  
Professor, Department of  
Biological Sciences



*I've been keeping tabs on the American Robins nesting in my yard.*

**AARON D. PAN, PH.D.**

Executive Director  
Associate Professor



*"What do you mean you have to work, daddy?"*

**DANI MARSHALL, M.A.**

Education Program Coordinator  
Education Division



*While working from home, I have been preparing example activities for the museum Summer Camps which include a session called "Around the Campfire" and another called "Summer Safari". I have been reading and doing research about connecting the millennial generation to museum programming events in anticipation for our future public programs. I have also had the opportunity to continue to host outreach sessions for Covenant Children's hospital through their activity room's CCTV system, showing off the Education Division's teaching collection while doing creative activities with the kids.*

**LISA BRADLEY, M.S.**

Research Associate & Production  
Editor for Publications  
Natural Science Research Laboratory



**ROBERT BRADLEY, PH.D.**

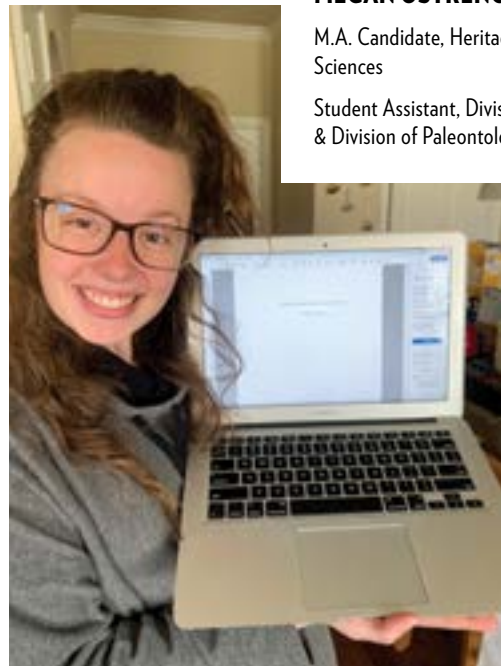
Director, Natural Science  
Research Laboratory  
Professor, Biological Sciences



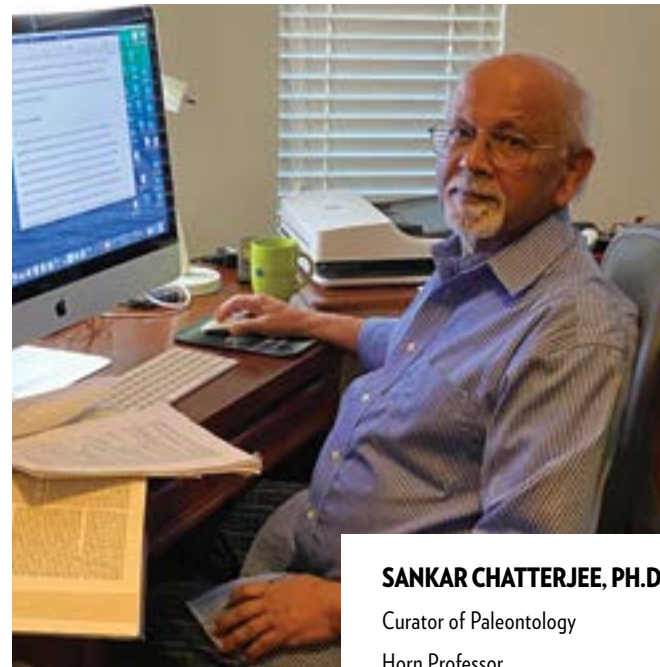
*Working from home brings out the real "us."*

**MEGAN OSTRENGA**

M.A. Candidate, Heritage & Museum  
Sciences  
Student Assistant, Division of Anthropology  
& Division of Paleontology



*While working from home, I finished writing my master's thesis! My project is about 3D modeling museum collection objects to determine if they can be used for research. An interesting benefit is that these models can be used and studied from home when we cannot be at the museum.*



**SANKAR CHATTERJEE, PH.D.**

Curator of Paleontology  
Horn Professor

*I wrote a short article for a Bengali newspaper about my home quarantine. (Please find the translated article on page 27)*

**CIENNA LYON**

M.A. Candidate, Heritage &  
Museum Sciences  
Student Assistant, Natural Science  
Research Laboratory (NSRL)



*I've been doing data entry for the NSRL using non-digitized specimen data sheets from the 80's and 90's. I like to listen to books on tape while I'm doing this to keep my brain occupied while entering numbers for a few hours every day. I've also been doing horse grooming for a woman who lives near Ransom Canyon on Sundays. This is a fantastic mental break from what has been a very weird semester. I spend about three hours out there brushing down eight rescue horses and one rescue donkey.*

**HYOJUNG CHO, PH.D.**

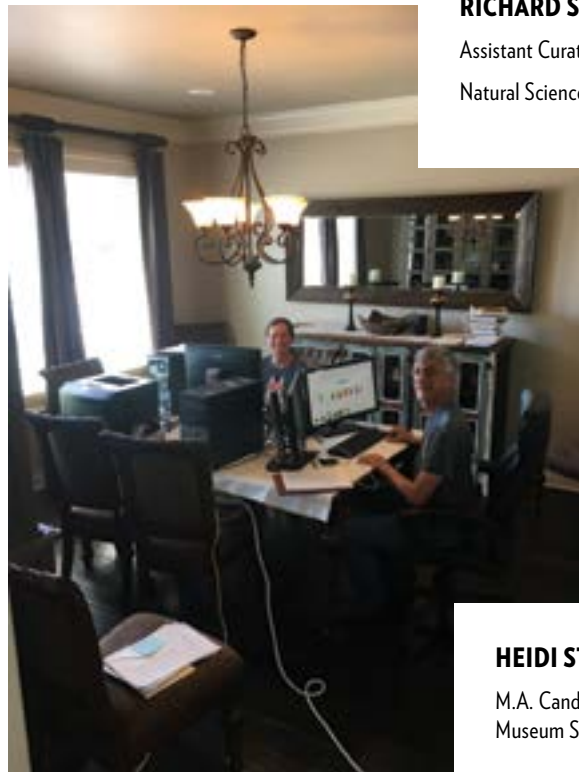
Associate Professor  
Heritage Management



Looking forward my next trip patiently. Traveling a foreign country guided by Orhan Pamuk from home for now.

**RICHARD STEVENS, PH.D.**

Assistant Curator of Mammals  
Natural Science Research Laboratory



**HEIDI STEVENS**

M.A. Candidate, Heritage &  
Museum Sciences

We turned our dining room into a messy office of some sort and have been analyzing data during the quarantine.

**CHRISTABEL ZIPS**

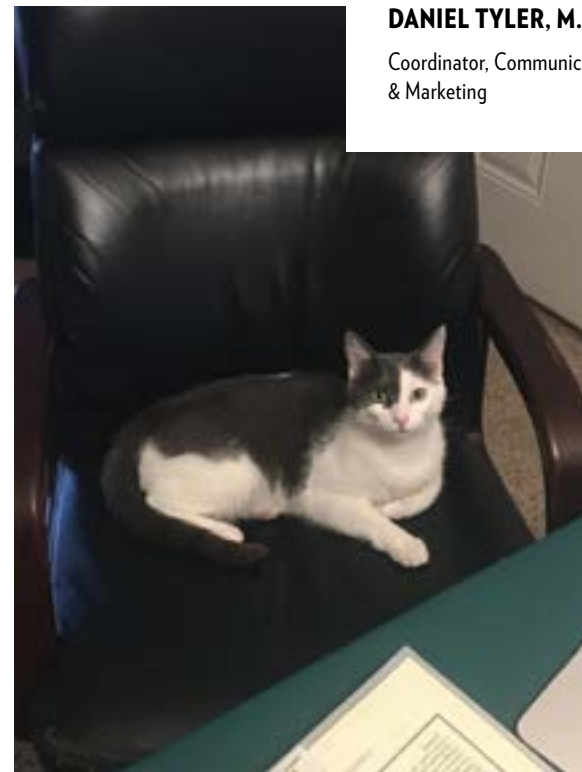
VSA Operations



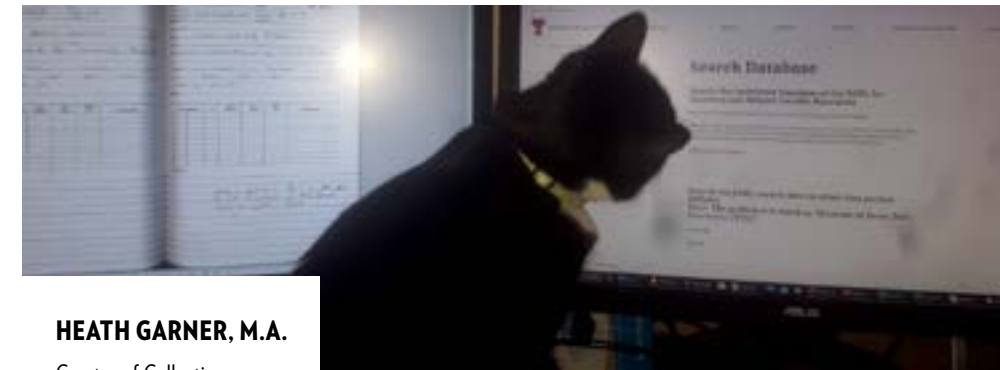
Our reality these past uncertain months. Homeschooling and working from home. Other than that, you can find us outside! Soaking up as much precious time with my son and my husband as life gave us a pause button.

**DANIEL TYLER, M.A.**

Coordinator, Communications  
& Marketing



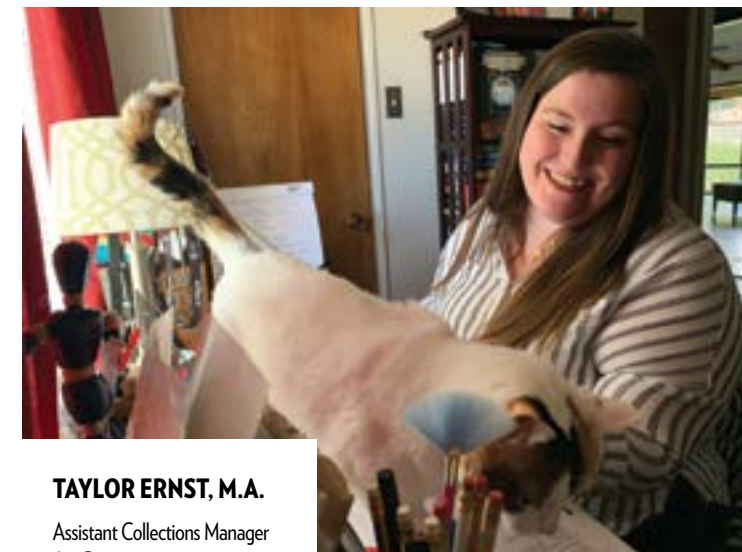
My coworker Goofy doing some important marketing work for the museum from home.



**HEATH GARNER, M.A.**

Curator of Collections  
Natural Science Research  
Laboratory (NSRL)

The NSRL has over 150,000 cataloged mammal specimens. Each specimen has dozens of important datum specific to it, including what species it is, where and when it was collected, and the physical components of the specimen available for research. During the COVID-19 pandemic, I (not pictured) have been proofing existing specimen data, adding new records, and making them available through the NSRL's online database. At times, my efforts have been assisted by unpaid intern Casper (pictured to the left).



**TAYLOR ERNST, M.A.**

Assistant Collections Manager  
Art Division

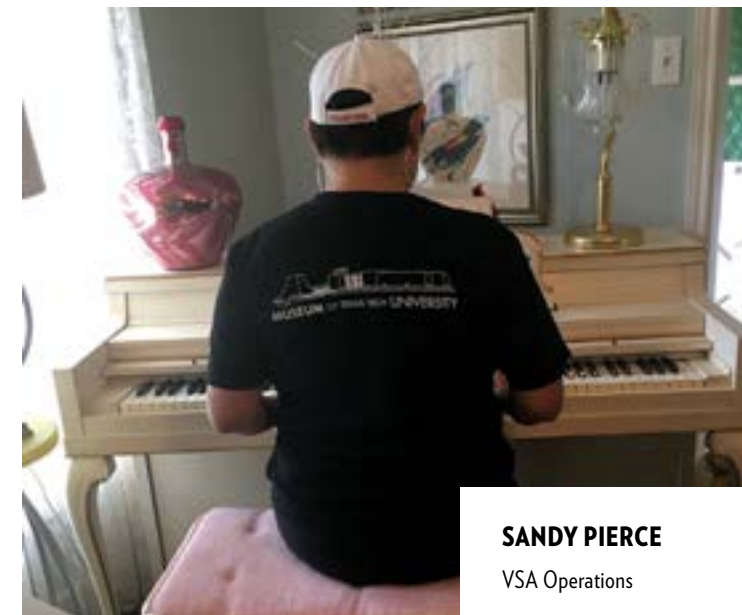
With my normal office in the basement, it can be challenging to see the sun during the day. At home I'm soaking up some vitamin D and enjoying my coworker. Maebly.



**JOHN-HENRY VOSS, M.A.**

Assistant Collections Manager  
Paleontology Division

Work continues on for my side of the Paleontology Division as I am currently working on a new research paper with another peer in the museum. The paper in question revolves around GIS, and I cannot mention more as the information is embargoed until publication. I am fortunate to work with two others while home. The first on the left is my Director of Security and the second on the right is my Executive Vice President of hugs and kisses. They are a great father-son duo.



**SANDY PIERCE**

VSA Operations

During quarantine I have been attempting to learn how to play the piano and taking my horse for a trot.



**CAMERON SAFFELL, PH.D.**

Curator of History  
Associate Professor  
Director, Museum Operations

*I, along with the History Division, have been revising and updating our procedures for numbering objects; which saves time, is more legible, and uses less toxic materials. We've been cleaning up our database and fixing issues with the electronic records. I've also continued to supervise three practicum students as well as prepare for summer practicums and my Summer I Museology course.*

*The Operations Division has had weekly conference calls to discuss how we're going to do things as we go back to work and coordinating the myriad of issues that are always there - HVACs stop working, getting staff into the museum for things they need, dealing with alarms, etc. Much of the conversation since late April has been developing and revising some very detailed guidelines so the rest of the staff and eventually visitors can return to the museum safely.*

**MARIAN ANN MONTGOMERY, PH.D.**

Curator of Clothing & Textiles



*Working in a light filled room has a nice contrast from my basement office while I've worked on the catalog and labels for Sumptuous Stitches and Tiny Treasures: Needlework and Needlework Tools from the Museum of Texas Tech University Collection and selecting hats to compliment the upcoming Global Headwear traveling exhibit.*



**LAURA RAY**

Manager,  
Communications & Marketing

*"Mommy! What are you doing? Are you working? Can I help you? What is that? Can I see? Let me play. Mommy look what I'm doing. I'm tired of you working. I need a snack." Pictured: Jackson (4) Kimber (1) Mom (tired)*



HELEN DEVITT JONES  
AUDITORIUM AND  
SCULPTURE COURT

# CROWN *of*

# THORNS

by Sankar Chatterjee, Ph.D.

**L**ike millions of people, my wife and I are self-quarantined because of the rapidly spreading virus. My two sons on the West Coast strongly advise us not to leave the house, since we are more likely to be affected due to our advanced years. My wife carries on talking and socializing with everyone in the country and abroad by telephone, while my condition is similar to that of Tagore's protagonist Amal in the drama *Post Office*. I look at the outside world through the windows of my reading room. Children ride bicycles. Elders walk in masks, some with their pet dogs. Everyone's destination is the beautiful park in front of our house. I am confined to my home, looking at the sky through the window of my study. The redbud tree in front of our house is blooming with pink flowers. Spring has come as surely as always in the midst of this disaster. The university is locked down. I am teaching students online. Tonight, on the evening news I saw that hundreds of thousands of people have died of the corona pandemic. There is no doubt that this death toll will rise much more in the coming months. Social distancing seems to be the only way to control this crisis until a vaccine comes out. The livelihoods of millions of people will be crushed by this, but there is nothing more precious than their lives.

Such an epidemic occurred during the Great Plague of London in 1665, killing 100,000 people. Cambridge University, about 100 kilometers away from London, was emptied out by the plague. Students and professors all were forced to leave the campus. A twenty-four-year-old student named Isaac Newton moved back to his childhood home at Woolsthorpe Manor as a precautionary measure. There was no one in this big house except his mother. This was the ideal environment for cosmic meditation. In this relaxed atmosphere, Newton made three major discoveries in science. The first was calculus, allowing him to calculate motion and change in the universe. The second was the refraction of light into a spectrum. He conducted an experiment in which he analyzed sunlight in his bedroom, punching a hole in his shutters for a small beam of light to come through. He showed with the help of two prisms how the white light was divided into a

rainbow. Third, he studied gravity, which aided in the creation of his laws of motion. The apple falling from the tree was moved by the same force keeping the Moon in orbit around the Earth, all the planets moving around the Sun, and holding together all the stars and galaxies in this vast cosmos. For his discoveries, 1665 is known as *annus mirabilis* – a year of wonders. Isaac Newton changed the world while social distancing during the plague.

I'm trying to write a book, *On the Origin of Life*, in this quiet quarantine period. The first vibrancy of life began in the world four billion years ago. The emergence of life is one of the most complex unresolved puzzles in science. There is no solution. Many scientists around the world are working on this. The famous British scientist JBS Haldane said a hundred years ago that life would not have started without the help of viruses. The more research I do on the origin of life, the more I accept Haldane's doctrine in light of today's new science. At the beginning of life, both viruses and early protocells lived side by side in two separate but interconnected worlds. Through repeated infections of protocells, the viruses donated DNA and various enzymes. Viruses may even have provided the first bacteria with critical enzymes required for cell division. The four-billion-year arms race of viruses and organisms has made both sides increasingly powerful and sophisticated. No one is retreating.

## “THE EMERGENCE OF LIFE IS ONE OF THE MOST COMPLEX UNRESOLVED PUZZLES IN SCIENCE. THERE IS NO SOLUTION.”

The virus is not a living entity until it comes into contact with life. The virus consists of a few strands of DNA or RNA, wrapped in a package of protein. The virus straddles life and nonlife in a twilight zone but comes alive when it attacks a living cell. The virus is a notorious hijacker. It can only reproduce by invading a host cell and hijacking its ribosomes to make viral proteins, turning the host cell into a viral factory and straining the cell to bursting. The host cell sickens and releases hundreds of progeny virions. The irony is that when an organism dies, the invading virus also dies unless it can spread to other organisms in time. Without a cellular victim, viruses cannot complete their cycle. So, many viruses have cleverly evolved to temper their toxicity. Organisms, in turn, have evolved numerous immune system defenses and various antibodies to prevent viral invasions. To work around these defenses, viruses mutate and create new strains which attack in different ways. Around and around we go. The fight continues, and always will. The great billion-year war between viruses and organisms are a major source of evolutionary novelties.

The virus has given us numerous diseases, from the common cold to flu, dengue, rubella, herpes, meningitis, polio, Ebola,

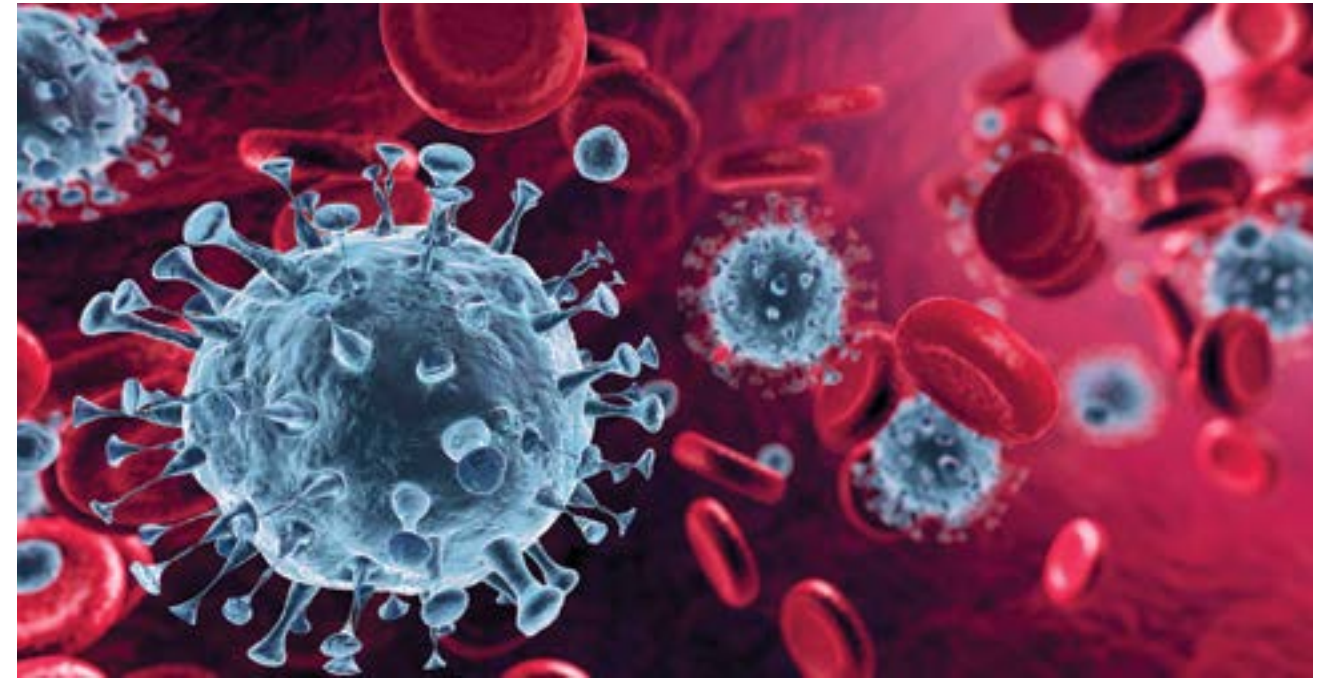


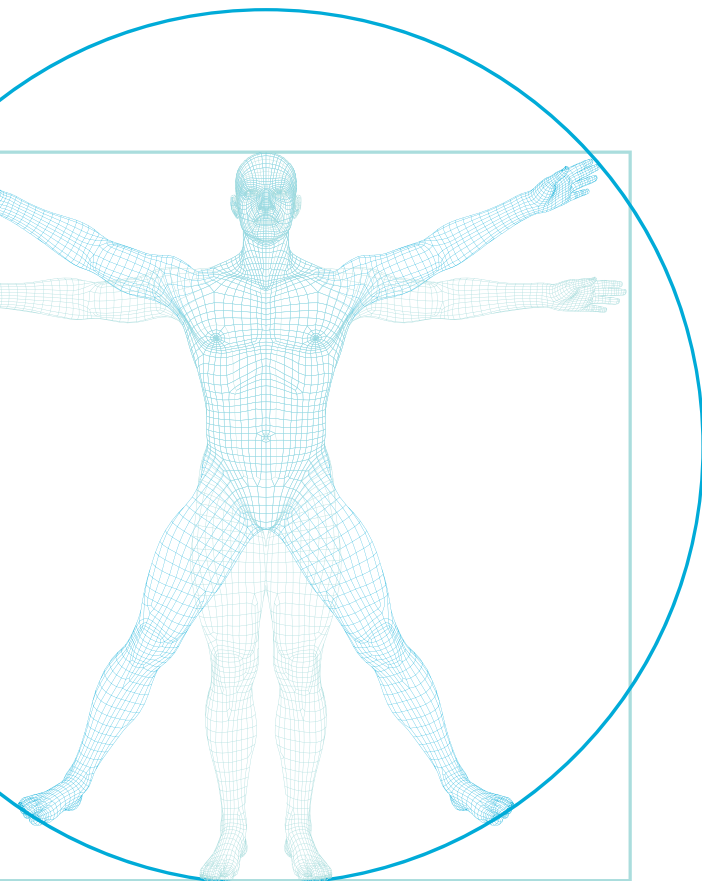
Figure 1. Image of coronavirus or COVID-19

AIDS, as well as countless deadly pandemics. Humans, bacteria, plants, and other animals – all are open to viral attacks. So, all have evolved and continue to evolve defenses. The virus is a major force driving evolution. Without viruses, there would be far less diversity in living things. The virus likely gave mammals a placenta – the mother's connection with the fetus. Eight percent, perhaps more, of our genome is viral in origin.

This coronavirus, which has so rattled the world, is about one thousandth of the diameter of a human hair. It contains a small RNA molecule, consisting of only 30 genes. In comparison, we have 30,000 genes. The virus is so small that it can only be seen under an electron microscope.

The name coronavirus is derived from the Latin corona, meaning crown, which refers to the characteristic halo of club-shaped spikes of protein. Perhaps a better name is ‘crown of thorns,’ mocking our sense of invulnerability. As kids, we used to throw thorny seed balls at our friends so that the seeds would stick to their hair and shirts like Velcro. Coronavirus is just like that. When the virus enters a person's nose or mouth, viral thorns latch onto human proteins found on the cells of lungs, airways, intestines, kidneys, and blood vessels. Soon the cell's machinery is hijacked and an alarming race to recovery or death begins.

It is about nine o'clock in the night. Now is our movie time. With apps from Amazon Prime, Netflix and Hoi Choi, we are watching all kinds of movies – English, Bengali, and Hindi. Stay healthy, live in joy as best you can in coming weeks, months, and seasons. I extend my heartfelt condolences to those who have left the world and those who mourn them.



# WHEREABOUTS

by Peter S. Briggs, Ph.D

# AND HIDDEN SPACES



ARTWORKS  
IMAGINE  
THE BUILT  
ENVIRONMENT



**T**

he Artist Printmaker Research Collection (AP/RC) encompasses an exceptional variety of artworks created since the 1960s. Among them, artists have spent considerable attention on what many call the “built environment,” that is the buildings and structures that humans have constructed and installed on the surface of the earth.

Buildings swamp our planet. From town to town, city to city, ranch to ranch, farm to farm, houses, barns, stores, schools, churches, offices, gas stations, supermarkets, restaurants, box stores...the list goes on...frame our daily lives. They provide shelters and homes, places to work and buy food, and places to learn and entertain. The buildings reflect what is important to us, who we are. As these buildings rise and later turn to ruins, they chronicle human activities and cultural expressions.

Four AP/RC artists from Texas and New Mexico turned their attention to distinctly regional views of our “built environment,” giving us a glimpse of the unparalleled collections of the Museum of Texas Tech University and each artist’s perspective on the buildings we live with.

*All of the artworks reproduced here are from the Artist Printmaker/Photographer Research Collection (AP/RC) in the Art Division of the Museum. They are just a few of the tens of thousands of artworks in the collection. For more information go to [artistprintmakerresearchcollection.org](http://artistprintmakerresearchcollection.org) or email [peter.briggs@ttu.edu](mailto:peter.briggs@ttu.edu) or [taylor.ernst@ttu.edu](mailto:taylor.ernst@ttu.edu). The collection is open to the public by appointment.*



# PAHO MANN

Mann grew up in eastern Arizona and Albuquerque and now lives in Dallas. While commuting to undergraduate and graduate school he was struck by the repetition of convenience stores, especially Circle K's (which had their 1951 origin in El Paso, Texas). Many Circle Ks have a distinctive architecture. A shed like structure with an expansive cantilevered overhang and a window-filled façade that parallels the street-side of the building. A large parking area fronts the façade. Mann was struck by the repeated abandonment of these distinctive structures resulting from a change in corporate ownership and business plan. As stores were left empty, local specialty shops moved in. He systematically cataloged and photographed these re-inhabited Circle Ks, first in Albuquerque and then in Phoenix noting that, "The shells left by this migration were filled by dozens of small businesses, each inhabiting a practically identical structure."



*Paho Mann (born 1978)*  
*Money Mart, Phoenix, AZ*  
*Photograph (406x508 mm)*  
*Purchased with funds from the Clifford Jones Memorial Endowment*  
 ©Paho Mann



*Paho Mann (born 1978)*  
*Carniceria Guerrero, Phoenix, AZ*  
*Photograph (406x508 mm)*  
*Purchased with funds from the Clifford Jones Memorial Endowment*  
 ©Paho Mann

# RICK DINGUS

Dingus spent decades photographing and teaching in Lubbock. While his artistic interests spread to Australia and India, most of his visionary energy focused on west Texas and the greater Southwest of the United States. Dingus wandered throughout the region tending to focus his camera's lens on those scenes where human behavior and the earth meet, like the limbs of a Diné shade house birthing from the earth or a dramatic sky framing a neon garlanded motel. The borders among economy, cultural ideology and landscape served the artist as a nexus for the past and present. He frequently softened these intersections by drawing on his photographs, increasing the dramatic impact and suggesting the romantic roots of his images.



*Rick Dingus (born 1951)*  
*Shade House Full of Light, Lukachukai, AZ*  
*Photograph (406x508 mm)*  
*Museum of Texas Tech Association, purchased with funds from the Helen Jones Foundation, Inc.*  
 ©Rick Dingus



*Rick Dingus (born 1951)*  
*Neon Motel, Junction, TX*  
*Photograph (405x507 mm)*  
*Purchased with funds from the Clifford Jones Memorial Endowment*  
 ©Rick Dingus

# LEIGH MERRILL

Merrill grew up in northeast Albuquerque and now lives in Dallas. She notes, "I came of age in the southwestern suburbs, and became sensitized to the aspirational quality of the front yards of our streets. Each street was nuanced with desire, achievement, and personal aesthetics." Her penchant for the character of the commonplace steered her images toward urban-suburbanscapes that travel Texas streets of interminable warehouses, facades of unremarkable buildings, and generic strip malls. The views are frontal, street side, and remarkably clean. The persistent order of façades fixes the artist's gaze. Yet, it is all an invention. Merrill conjures these images. They are fictions constructed of many hundreds of isolated photographs digitally manipulated, captured, inventoried, meticulously constructed anew. They are imaginary spaces, dream-like places that seem so probable and possible.

Leigh Merrill (born 1978)  
*Jack's \$1.00*  
 Photograph (495x1005 mm)  
 Purchased with funds from the  
 Clifford Jones Memorial Endowment  
 ©Leigh Merrill



Leigh Merrill (born 1978)  
*Dallas Costumes*  
 Photograph (370x1110 mm)  
 Purchased with funds from the  
 Clifford Jones Memorial Endowment  
 ©Leigh Merrill

# ANTHONY LAZORKO

Tony Lazorko moved to Mesilla, New Mexico after retiring in 2000 as Art Director at the St. Louis Post-Dispatch newspaper. He embraced in his art the spirit and vision of American Regionalism, a realist art movement that arose in the 1930s and featured familiar scenes from the routines of everyday life. Yet, Lazorko's images have a distinctive 21st century flair. Images of people feeding at McDonalds, cars stopped for gas, motel lights, corner restaurants, neighborhood bars and house trailers dominate his colorful woodblock prints. As the artist noted, "The focus of my work has always been to depict something about the American experience..."



Anthony Lazorko (1935-2017)  
*Eat-Rite, 2003*  
 Woodcut (280x432 mm)  
 Purchased with funds from the  
 Clifford Jones Memorial Endowment  
 ©Estate of Anthony Lazorko

Anthony Lazorko (1935-2017)  
*Temple Chevron, 2007*  
 Woodcut (210x368 mm)  
 Purchased with funds from the  
 Clifford Jones Memorial Endowment  
 ©Estate of Anthony Lazorko



# LINDA FISHER

MUSEUM OF TEXAS TECH  
UNIVERSITY FRIEND

*by* **Marian Ann Montgomery, Ph.D.**



*Museum supporter Linda Fisher. Photo taken by Dr. Charles Fisher.*

**L**inda Fisher has been an extraordinary friend to the museum of Texas Tech University and to many throughout West Texas. She has donated many objects to the Clothing and Textiles Collection of the Museum, 71 of which are quilts she made herself and will be seen in an exhibit planned for 2021. To think of Linda is to think of her smile and her many kindnesses. Apparently even as an infant she smiled a lot as seen in the picture of her with her mother.

Linda comes from a line of women who were needle workers. Her grandmother, pictured below with Linda and her mother, made dresses for her twin daughters from feed sacks. When the girls outgrew the dresses she made a Sunbonnet Sue quilt, which Linda donated to the museum. The quilt has been seen in the recent feed sack exhibit and catalog, *Cotton and Thrift: Feed Sacks and the Fabric of American Households*. Times were not easy for Linda's grandmother or parents, so hard work and making something from nothing were important.

We highlight Linda in this issue of the museum's magazine in preparation for the exhibit of her work and a sale she is conducting to benefit the Endowment for the Clothing and Textiles Curator position at the Museum of Texas Tech University. In addition to the 71 quilts she made herself, Linda has donated 10 pieces of her own needlework as well as quilts by other important West Texas quilters, feed sacks, dolls, garments and research publications. Linda was the essential conduit that brought to the collection the work of Lubbock quilt pattern designer and quilt teacher, Jackie Reis. She has been invaluable in helping the museum document the creativity of women in West Texas.



Linda Fisher in the arms of her mother, Margaret Letha Wilson Timmons, in Lubbock, Texas. Photo courtesy of Linda Fisher (Mrs. Charles).

## Needlework

Born in Lubbock, Linda began her creative endeavors as a young girl in Muleshoe, Texas, where her family moved when she was in the second grade. Her father founded the State Line Irrigation Company in Muleshoe and her mother worked there as the secretary. Linda's mother gave her needlework and sewing projects to keep her occupied after school. She had to finish one project before going on to another. Linda was certain her mother made her do these projects so that she wouldn't be talking to boys on the phone. It was always evident how much progress Linda had made every day.

Linda brings to her work an artist's eye, developed over years of being enchanted by color. She began her adult creativity in needlework and worked through the Embroiderers' Guild of America Master Craftsman Program as a member of the West Texas Embroiderers' Guild. Each area of the program has about six steps and in the late 1980s and early 1990s Linda achieved the Master Craftsman level in four areas: Canvas in April 1986, Color for Needlepoint, Design for Needlepoint, and Counted Thread in 1993.



Linda Fisher as a toddler in the arms of Margaret Dollie Wilson, her grandmother, with her mother Margaret Letha Wilson Timmons at her parent's home on Duke Street in Lubbock. Photo courtesy of Linda Fisher (Mrs. Charles).



Autumn Jewels Quilt by Linda Fisher 2013. This quilt won the Ogallala Quilt Festival 2014 Merchant's Award. Gift of Linda Fisher (Mrs. Charles), TTU-H2019-082-003.

Through the Embroiderer's Guild she also earned her Teacher, Judge and Master Judge certifications. Several of those pieces made for the Master Craftsman Program are showcased in the museum's exhibit and catalog *Sumptuous Stitches and Tiny Treasures*.

In 1995, Linda was one of two Texas women invited by First Lady Hillary Clinton to stitch a Christmas ornament that would be hung on the Christmas tree in the Blue Room of the White House. While the original remains at the White House, a reproduction of that piece is in the Museum.

## Moving to Quilts

Sharon Newman's quilt shop happened to be next door to the shop we know today as Pocket Full of Stitches, on 50th Street, where Linda got her needlework supplies. She was entranced by the wall of colorful fabrics in the quilt shop and switched from needlework to quilting in the late 1990s.

Linda's style is unique both in needlework and in quilting. She has a great sense of color, balance and harmony that she brings to the work. She seldom follows a pattern or takes a class that requires her to make a piece in a certain way. Linda loves to break the rules and she loves to put her own creative spin on a piece. A frequent shopper at estate sales, Linda finds unfinished blocks or quilt tops that she puts together, adding her special creativity to the mix. As with most quilters today, her quilts are machine quilted. While many quilters send out their largest quilts to be professionally quilted on a long arm machine, Linda does all her own machine quilting on a set up in her guest room.

Linda is a member of the South Plains Quilt Guild and has served as their president. She is also a member of the Caprock Art Quilters and the Ogallala Quilter's Society, among others. Her membership in these significant West Texas organizations has influenced her work but she has also influenced the work of others in West Texas through teaching and exhibits. Additionally she has been a judge at the South Plains Fair.



*Lone Star 2009 Quilt. Although based on the traditional Lone Star quilt pattern the arrangement and the addition of large-scale applique, complete with a longhorn, make this quilt unique. Gift of Linda Fisher (Mrs. Charles) TTU-H2015-084-012.*

## Preserving History

Every curator has to be careful to bring in not only the best objects available that are representative of a particular era, but also objects that will stand the test of time. Linda has offered over 90 quilts to the museum, 71 of which have been added to the collection. These are the quilts that will be featured in the exhibition at the beginning of 2021. It is rare to find this many quilts by one maker at any museum. Mary Schaefer's quilts at Michigan State University are one such collection, but few others exist. Having a large body of work of one person allows for the study of their full range of different styles. Just as the Museum's art print collection allows for the study of the complete work of one artist, the Fisher quilt collection allows for similar study of the quilts of the late 20th and early 21st centuries. Although influenced by the trends of the time in color and patterns, Linda's work is her own. While traditional patterns may be included she arranges them in a unique manner or adds interesting embellishments.

## Linda's Generosity

Linda says that quilting is her therapy. She has worked through life's problems this way, which she says is a lot healthier than other activities or habits she could have taken up. She continues to quilt and likely has dozens of new quilts as a result of sheltering in place.

Linda's generosity to the Museum of Texas Tech University extends to the quilts that were not accepted into the collection, primarily due to space restrictions. These 64-plus quilts will be offered for sale through an on-line auction with a buy it now feature on Feb. 27, 2021, Linda's next birthday. The funds raised from this sale will all go to the Endowment for the Clothing and Textiles Curator position, insuring that there is always someone at the museum taking care of the collection that features the material culture of so many West Texas women.



*An example of Linda's creativity expressed in her quilts is this piece Color Your World with Gratitude made in 2011 while she was exploring the color wheel. It is now used on the label for her brother's winery near Waco. Gift of Linda Fisher (Mrs. Charles). TTU-H2015-084-011.*

Linda has said, "I want to be sure our treasures are well cared for in the future. The cultural history and accomplishments of our women are important." So she hopes you will join her in the fund raising effort. Please mark your calendar for her birthday party at the museum on February 27, 2021.

## Exhibit of Quilts Made by Linda Fisher

Exhibit dates January 16 to June 1, 2021. (Due to COVID-19 these dates are subject to change. Please check the museum website for the latest information.)

## Linda Fisher Birthday Party and Quilt Sale

Benefitting the Endowment for the Clothing and Textiles Curator Position of the Museum of Texas Tech University.

February 27, 2021

In the Sculpture Court located in the museum. Check the museum website in early 2021 for further information and a link to the auction.

# NSRL CELEBRATES SEVERAL ACHIEVEMENTS

In 2019, the Natural Science Research Laboratory (NSRL) achieved several notable accomplishments.



## MEMORIAL VOLUME PUBLISHED IN HONOR OF DR. ROBERT J. BAKER

Dr. Robert J. Baker, Horn Professor of Biological Sciences and Director of the NSRL from 1976 to 2015, passed away in 2018. In recognition of Dr. Baker's contributions to mammalogy, research, education, and Texas Tech University, a memorial volume was developed and published as volume #71 of the Special Publications of the Museum. The resulting work, entitled *From Field to Laboratory: A Memorial Volume in Honor of Robert J. Baker*, contains more than 900 pages, 43 peer-reviewed scientific manuscripts and essays, and 54 encomia contributed by Dr. Baker's former students, colleagues, and friends. The variety of topics in the volume reflects Dr. Baker's diverse interests and contributions to science and education. The volume was edited by Robert D. Bradley, Hugh H. Genoways, David J. Schmidly, and Lisa C. Bradley. The editors wish to thank everyone who made this project possible, including 121 authors, 77 reviewers, 63 donors, and more. This collaborative effort was completed in less than 18 months and was truly a labor of love for everyone involved.

*The publication is available for free download from the NSRL website, <https://www.depts.ttu.edu/nsrl/publications/downloads/SP71.pdf>. Printed copies of the volume may be purchased for \$75 by contacting Lisa Bradley by email, [lisa.bradley@ttu.edu](mailto:lisa.bradley@ttu.edu).*

*From Field to Laboratory: A Memorial Volume in Honor of Robert J. Baker.*

*Dr. Robert Bradley, Director of the Natural Science Research Laboratory with Dr. Lawrence Schovanec, President of Texas Tech University holding the Memorial Volume.*



# NATURAL SCIENCE RESEARCH LABORATORY

## GENETIC RESOURCES COLLECTION RENAMED IN HONOR OF DR. ROBERT J. BAKER

Dr. Robert J. Baker was the key figure in the establishment, growth, and development of the NSRL and the GRC. By request of the current Director of the NSRL, Dr. Robert Bradley, and with the support of Dr. John Zak, Chair of Biological Sciences, Dr. Gary Morgan, former Executive Director of the Museum, Dr. Jill Hoffman, then Acting Executive Director of the Museum, and Dr. Michael Galyean, Provost, the Texas Tech University Board of Regents officially approved the renaming of the GRC as the Robert J. Baker Genetic Resources Collection at its Board meeting on 12 August 2019. This recognition was in honor of Dr. Baker for his establishment of the GRC and his enthusiastic support and development of the collection through field work, grants, publications, student research, and personal financial support.



*Genetic Resources Collection located inside the Natural Science Research Laboratory renamed in honor of Robert J. Baker.*

## NSRL CATALOGUES ITS 150,000TH MAMMAL SPECIMEN

The Mammal Collection of the NSRL celebrated the cataloging of its 150,000th voucher specimen, a Spotted Bat (*Euderma maculatum*) that was collected, prepared, and deposited by Dr. Richard Stevens and his students. Dr. Stevens and his field crew captured this magnificent specimen during field work near Cloudcroft, New Mexico. Kudos to these field biologists for providing the NSRL with a charismatic and memorable 150,000th specimen!



*A Spotted Bat (Euderma maculatum), was the 150,000th specimen of the Mammal Collection of the NSRL.*

# NATURAL SCIENCE RESEARCH LABORATORY

## GENETIC RESOURCES COLLECTION RECEIVES ACCREDITATION BY THE AMERICAN SOCIETY OF MAMMALOGISTS

The NSRL and particularly the Robert J. Baker Genetic Resources Collection (RJBGRC) received national recognition, as it became the first genetic resources collection accredited by the American Society of Mammalogists (ASM). Accreditation by ASM means the RJBGRC meets or exceeds a series of criteria and standards relative to the care, maintenance, and use of genetic resource collections (specifically for mammals). These published standards were developed by a diverse team of scientists and curators, including the curators and staff of the NSRL (Phillips et al. 2019. Curatorial guidelines and standards of the American Society of Mammalogists for collections of genetic resources. *Journal of Mammalogy* 100(5):1690–1694).



Robert J. Baker Genetic Resources Collection received national recognition, as it became the first genetic resources collection accredited by the American Society of Mammalogists.

## OCTOBER 2019 EVENT HELD TO CELEBRATE NSRL ACHIEVEMENTS

In October, an event to mark and celebrate these achievements was attended by more than 50 invited guests, as well as staff and Museum personnel. The event included a brief presentation by Dr. Bradley about the NSRL and remarks from Dr. Hugh Genoways about the development of the Baker memorial volume, followed by a tour of the NSRL facilities and a viewing of the 150,000th voucher specimen. The celebration then moved to the NSRL atrium, where guest speakers, including TTU President Lawrence Schovanec and Dr. Laura Baker, wife of the late Dr. Baker, made a few remarks. Finally, the event concluded with a cake-cutting and refreshments, and signing of copies of the Baker volume by the editors and several authors.

The faculty and staff of the NSRL appreciate the many supporters that attended this event and looks forward to celebrating many more achievements and milestones of the NSRL in the future.



Guests attend a celebratory event on October 22, 2019 to recognize the NSRL's achievements.



The celebratory cake featured an image of a Spotted Bat.

## FROZEN IN TIME

On 6 October 2019, the Museum of Texas Tech University opened an exhibition (Gallery 2) that highlights the value of genetic resource collections to scientific discovery, education, and society. With text panels and objects, the exhibit, titled *Frozen in Time*, illustrates how genetic resource collections, such as the Robert J. Baker Genetic Resources Collection (RJBGRC) of the Natural Science Research Laboratory (NSRL) of the Museum, archive and



*Frozen in Time* exhibition opened October 6, 2019.

preserve samples of animal tissues from around the world. Each tissue sample in a genetic resources collection is unique and irreplaceable, and by being “frozen in time” these samples can be examined by scientists to reveal clues to that animal’s genetics, environment (contaminant exposure), health (diseases and parasites), and many other pieces of information vital to our understanding of life on earth. The data derived from these samples have implications for public health and safety, climate change, endangered species preservation, agricultural impacts,

and more. Thus, the preservation of these samples provides the potential to answer complex scientific questions and result in future discoveries of untold value to society.

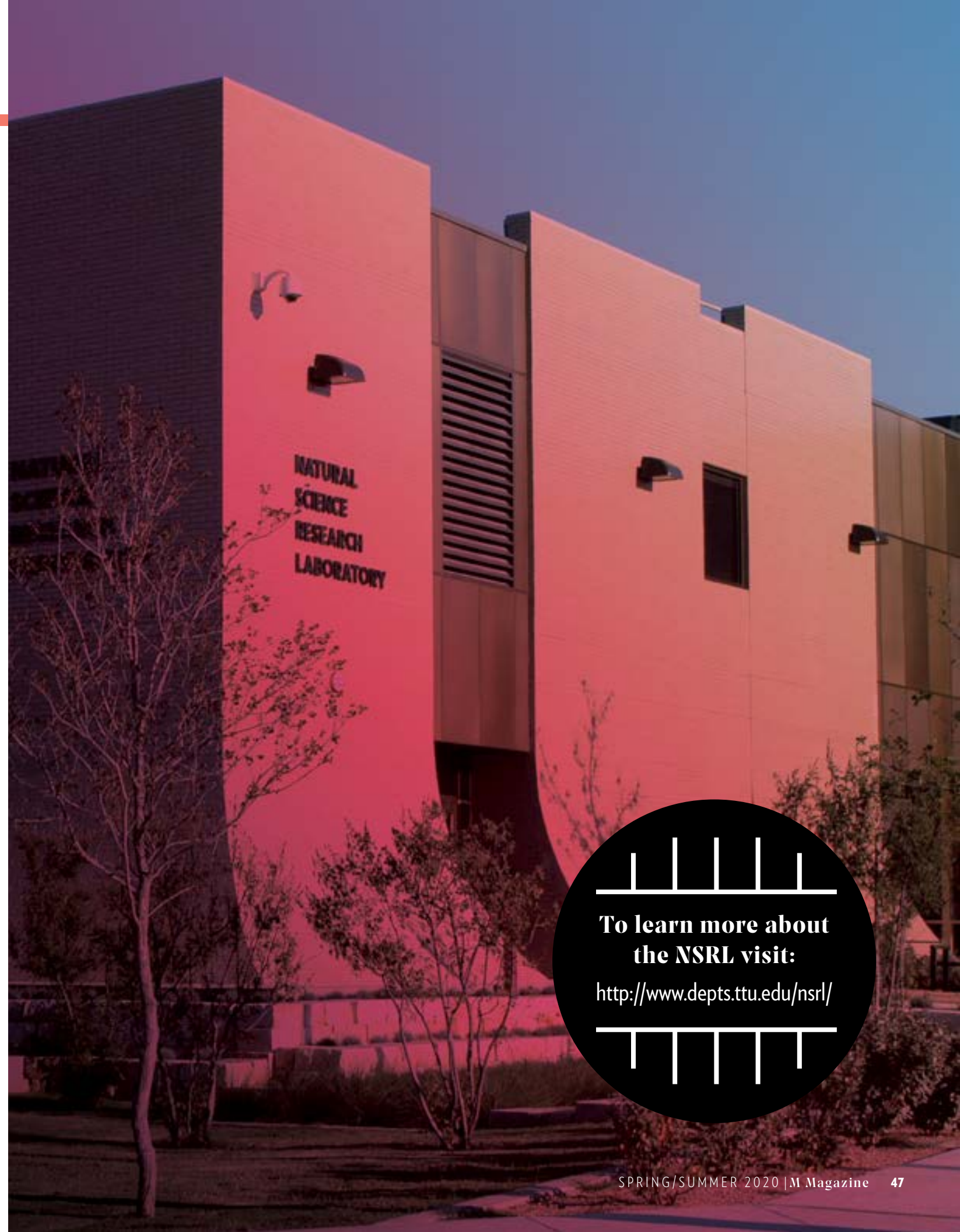
The NSRL maintains four natural history collections for scientific research purposes: mammals, birds, invertebrates, and genetic resources. The genetic resources collection is the fastest-growing and most utilized collection of the NSRL. At more than 415,000 samples, the collection is one of the largest such collections in the United States and one of only a few academic collections stored in liquid nitrogen freezers, which is the state-of-the-art standard for preservation of these valuable scientific resources. Samples include various organ tissues, blood, and DNA from more than 100,000 specimens of more than 1,400 species of mammals and other taxa. The RJBGRC contains 4 subcollections: the Biodiversity collection of wildlife samples, which have been collected since the establishment of the NSRL and are used for a variety of scientific research purposes; the Chernobyl collection, which contains radioactive tissues from specimens collected at the site of the nuclear disaster in Ukraine; the Wolcott Wound Care collection, which archives microbiome samples from human wounds; and the Bighorn Sheep Collection, which established the NSRL as the official repository for samples associated with studies of North American bighorn sheep. The latter two collections are the result of partnerships and funding initiatives with, respectively, Dr. Randall Wolcott, Director of the Southwest Regional Wound Care Center, and the Wild Sheep Foundation and Texas Bighorn Society.

The NSRL has a loan policy that permits qualified scientists to borrow genetic samples for research purposes. For example, in the past five years (2015–2019), the GRC granted 192 loans of 6,707 tissues to scientists around the world for research. Of particular relevance today, GRC samples routinely are provided to university researchers and to state and federal agencies, such as the CDC, to address research on viral diseases, including the identification of vector species, reservoir species, modes of transmission, and the geographic origin of hosts and viruses. For example, samples from the NSRL were used by researchers to document that the Four Corners Disease (Sin Nombre Virus) was a naturally-occurring virus and not an escaped biological weapon. NSRL tissues have



been used to describe numerous zoonotic diseases, including a new hantavirus (Catacamus), 9 new arenaviruses (Skinner Tank, Big Brushy, Catarina, Tonto Creek, Real de Catorce, Bear Canyon, Ocozocoaulta, Middle Pease River, Palo Verde), and a new tick-borne encephalitis. With the increasing incidences of zoonotic diseases in recent years, including the novel coronavirus that causes COVID-19, the value of these genetic resource collections for research is more critical than ever.

*Funding for this exhibit was provided by the National Science Foundation "Collections in Support of Biological Research" grant to the NSRL (#1451925) for development of the liquid nitrogen system for the Genetic Resources Collection. The exhibit was developed by Lisa Bradley and Museum Science student Heidi Stevens, with additional content and objects contributed by Kathy MacDonald, Heath Garner, Robert Bradley, and Caleb Phillips.*



To learn more about the NSRL visit:  
<http://www.depts.ttu.edu/nsrl/>



# FACULTY OFFER NOVEL THEORY FOR ORIGIN OF LIFE ON EARTH



by Glenys Young

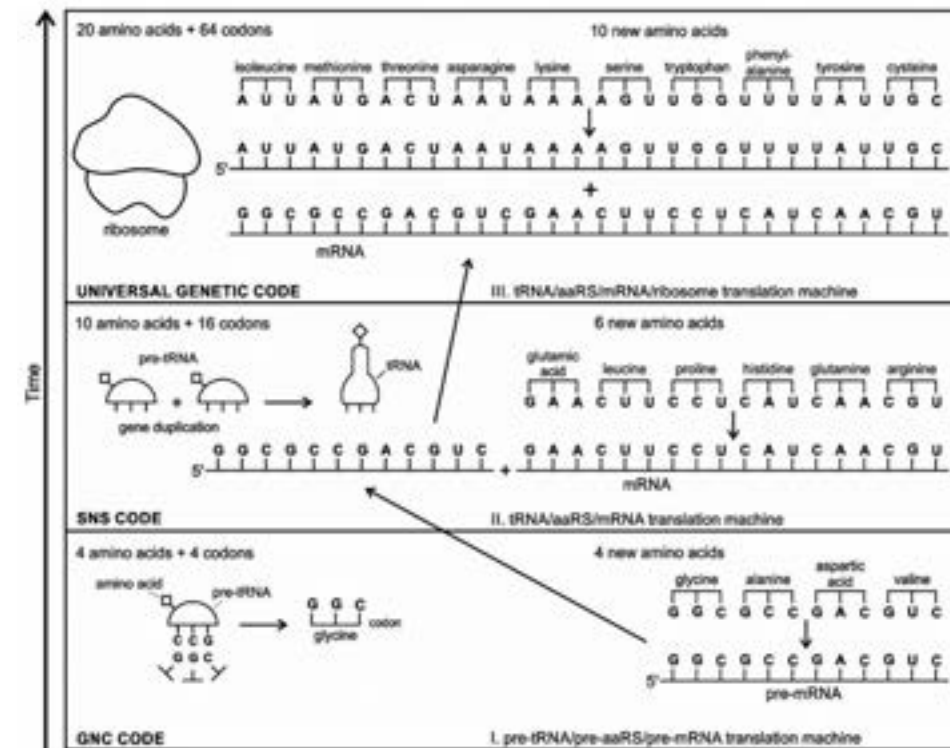
**S**ankar Chatterjee and Surya Yadav have created a simulation showing how the genetic code may have evolved.

Six years ago, Texas Tech University's Sankar Chatterjee released a groundbreaking theory on the beginning of life on Earth, what he called "the Holy Grail of science." He claimed that a heavy bombardment of icy comets and carbon-rich asteroids 4 billion years ago left young Earth's surface pockmarked with craters, similar to the surface of the moon.

Filled with water and the cosmic building blocks for life, delivered by these meteorites, these craters eventually became the primitive cradles in which the first simple organisms grew.

Based on theories of chemical evolution and evidence from the Earth's early geology, Chatterjee's proposal still left one gaping question unanswered: exactly how these primordial organisms developed information systems.

"It's become clear in recent years that the biological world is computational at its core," said Chatterjee, a Horn Professor in the Department of Geosciences and Curator of Paleontology at the Museum of Texas Tech University. "Algorithms, or instruction sets, are found in every cell and in the manner in which information flows through and between cells. Digital storage of molecular information is the key to defining life and understanding its origin. The key mechanism is the origin of the genetic code."



The three stages of the evolution of the genetic code correspond to the evolution of the translation machines and the progressive addition of amino acids. In the abiotic stage, the primitive GNC code appeared, which code four amino acids: valine, alanine, aspartic acid and glycine. In the next stage, the translation machine becomes modified and efficient with the evolution of the tRNA/aaRS/mRNA translation machine, when six new amino acids—glutamic acid, leucine, proline and histidine were created. With the appearance of ribosomes, the transitional SNS code is modified to universal genetic code with 64 codons and 20 amino acids.

As Chatterjee explains, the genetic code was deciphered in the 1960s, and the many scientists responsible for cracking the code were awarded Nobel Prizes. But since that time, there has been no comprehensive theory about why the genetic code evolved in the first place, before the origin of DNA and the first life.

Until now.

In collaboration with Surya Yadav, a professor of information systems in the Jerry S. Rawls College of Business, Chatterjee has built upon his former theory.

"The question of the origin of the code is the greatest challenge in modern molecular biology and origin-of-life research," Chatterjee said. "We have provided a novel model: how the genetic code might have evolved gradually with the improvement of the translation machine during protein synthesis."

## Origin of the genetic code

In the craters on Earth's surface 4 billion years ago was what Chatterjee calls a prebiotic soup: a combination of water and biomolecules deposited there by comets and meteorites, all stewing together thanks to the hydrothermal energy from erupting vents. Among the biomolecules were likely several dozen types of amino acids and an assortment of nucleotides. Four specific nucleotide bases – uracil (U), cytosine (C), adenine (A) and guanine (G) – began combining into chains of ribonucleic acid (RNA). Similarly, about 12 kinds of amino acids were joined together to form peptide chains.

Because RNA contains a sequence of these nucleotide bases that is analogous to the letters in a word, it can function as an information-containing molecule, Chatterjee explained. Moreover, RNA, as a single chain, is free to take any kind of shape. From this basic architecture of a single-stranded RNA molecule, different species of RNA – such as ribozymes, transfer RNA (tRNA), messenger RNA (mRNA) and ribosomal RNA (rRNA) – evolved inside protocells. Each species contained a supply of information, distinct in attribute and configuration, in response to the specific amino acids it collected.

"The advent and multifunction of different species of RNA molecules signal the transition from the age of chemistry to the age of information," Chatterjee said.

Among the molecular milieu, mRNAs began to encode the recipe for proteins, while tRNAs carried different amino acids and tried to match the three-nucleotide-sequences – called codons – of mRNA, each of which corresponds to a specific amino acid.

But mRNA languages and protein languages are different. A bilingual translator was needed to read the message in mRNA and a molecular machine was needed to manufacture protein according to the recipe. The translators are special kinds of enzymes, called aaRS, that help convert the code to the right language. Then the mRNA is fed into the ribosome, and the ribosome reads the message and makes a protein accordingly.

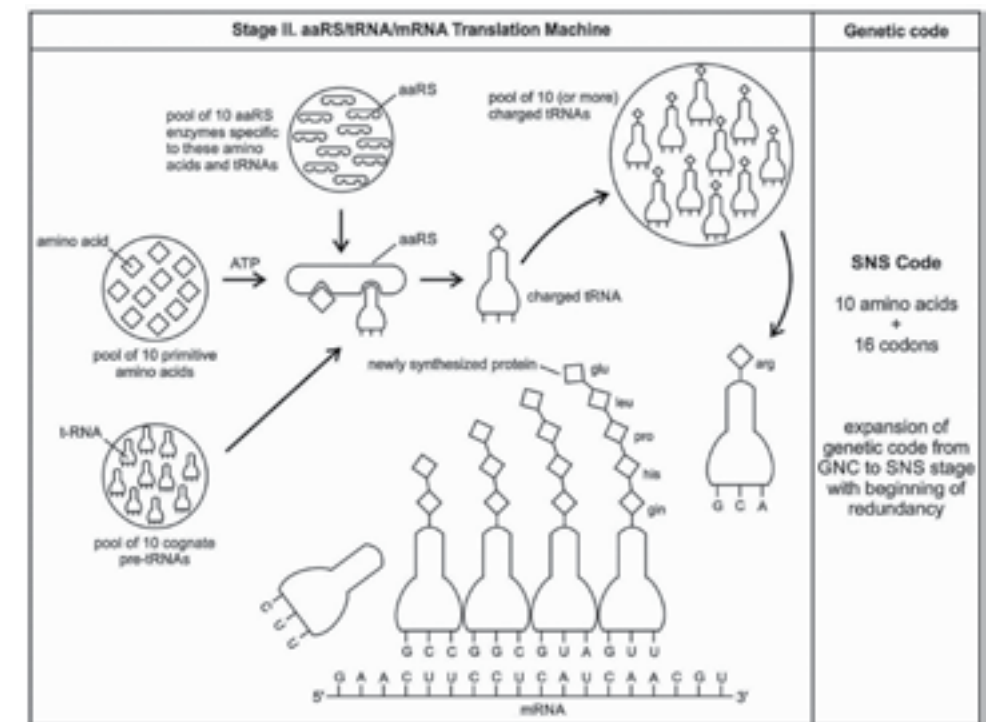
The genetic code is essentially a set of rules defining how the four-letter code of mRNA is translated into the 20-letter code of amino acids, which are the building blocks of proteins. Proteins, in turn, are the “hardware” – the main enzymes and structural material – for cells.

### Evolution of the genetic code

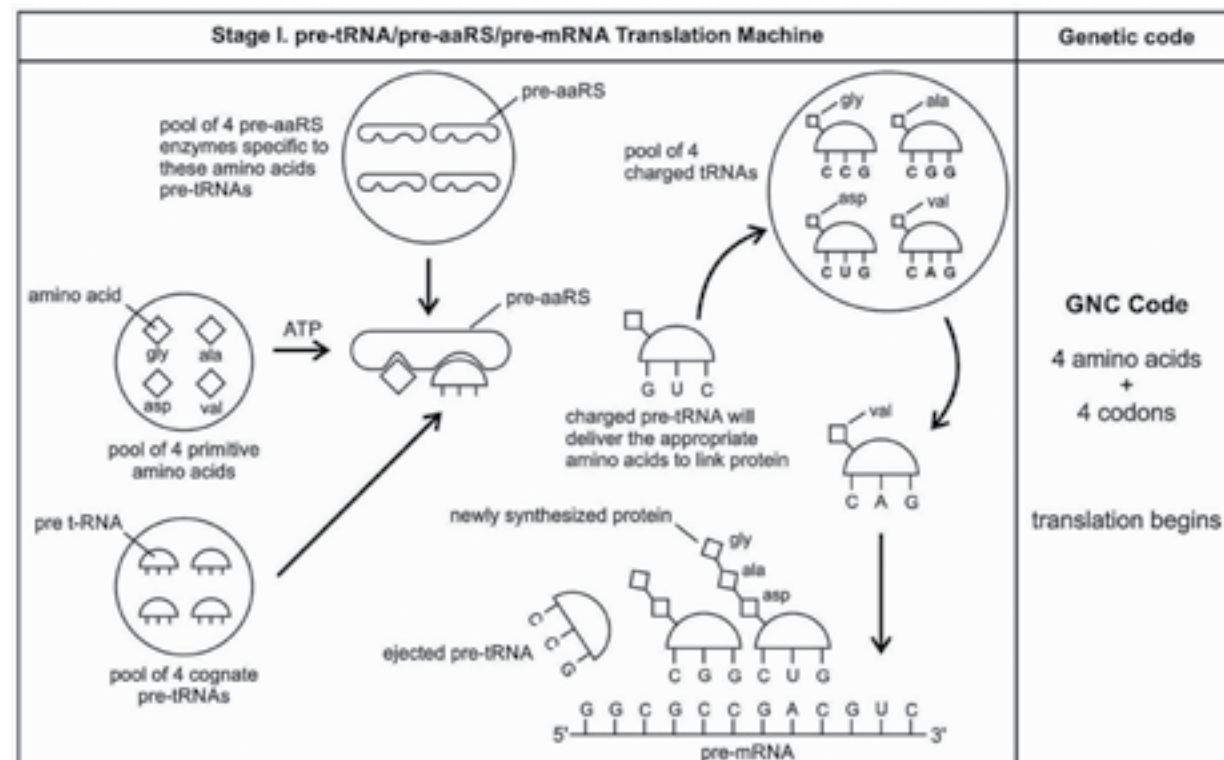
The genetic code developed in three distinct stages that coevolved with the refinement of the translation machine. The primitive genetic code used only four amino acids and four codons to make a simple strand of protein.

“In the primitive translation machine, a symbiotic relationship was established among three components – pre-tRNA, pre-aaRS, and pre-mRNA – to create a short chain of amino acids, which form the biosynthetic protein,” Chatterjee said. “The protein chain grew through the addition of further amino acids in the same manner. By linking the amino acids carried by the pre-tRNAs, the first protein synthesis occurred. But at this stage of the primitive code, the translation machine was simple and made errors during protein synthesis.”

The transitional genetic code was the second generation, employing 10 amino acids and 16 codons. Compared to the primitive translation machine, the transitional translation machine was somewhat refined to minimize errors. In this stage of translation, pre-tRNA evolved into tRNA through gene duplication. Pre-mRNA evolved into mRNA by linking several strands of pre-mRNA to increase the storage capacity. Pre-aaRS joined to specific tRNA and became aaRS. The protein chain in this stage was moderately long.



The transitional, aaRS/tRNA/mRNA translation machine. Ten primitive amino acids joined with specific tRNA molecules by aaRS enzymes to form a pool of 10 charged tRNA molecules. These charged tRNA molecules begin to decode mRNA, creating a chain of longer, biosynthesized protein molecules. At this stage, the transitional SNS code appears with 10 amino acids for 16 codons. The translation is moderately efficient with the appearance of redundancy to minimize the translation errors.



The primitive, pre-aaRS/pre-tRNA/pre-mRNA translation machine. Pre-aaRS is the matchmaker between pre-tRNA and amino acid. Four primitive amino acids and their four pre-tRNAs and pre-aaRS molecules were selected from the prebiotic soup. Each amino acid with its specific pre-tRNA molecules was catalyzed by pre-aaRS enzyme to create a charged pre-tRNA molecule. In a similar way, four charged molecules were available to decode the short string mRNA one at a time. Each pre-tRNA delivers the appropriate amino acid, which is linked to form a chain of biosynthetic protein for the first time, containing four amino acids. This is the first stage of translation, when primitive GNC code evolves. For a simulation of this stage, click on the image.

## “THE QUESTION OF THE ORIGIN OF THE CODE IS THE GREATEST CHALLENGE IN MODERN MOLECULAR BIOLOGY AND ORIGIN-OF-LIFE RESEARCH”

the translation machinery became more elaborate with tRNA/aaRS/mRNA/ribosome complexes, which enabled higher specificity in the genetic coding. The protein chain in this stage is long and complex, with a biological information system that adds rules, instruction, feedback and algorithm to its repertoire.

Chatterjee and Yadav hypothesize that the genetic code evolved as pathways for the synthesis of new amino acids became available – and these, in turn, were the results of progressive refinement of the translation machine.

“Through successive refinement, the universal code has optimized functional efficiency to minimize coding errors,” Chatterjee said. “Once the universal code evolved, the protein synthesis became highly coordinated, beautifully orchestrated and universally adopted by all life.”

The universal genetic code was the final stage of code development along with the evolution of translation machine, maximizing its efficiency. It contains 64 codons specifying 20 amino acids. Chatterjee says the universal code proved more reliable than the primitive or transitional codes with minimum errors, so natural selection favored it.

Chatterjee and Yadav proposed that the coevolution of the genetic code and the translation machine marks the beginning of Darwinian evolution at the molecular level, an interplay between information and its supporting structure. This hypothesis provides the logical and incremental steps for the origin of programmed protein synthesis.

The final and most important component of the translation machine, the ribosome, was a hybrid of rRNAs and r-proteins. With the participation of the ribosome,

“The code obviously is not the result of a random assignment of codons to amino acids,” Chatterjee said, “because it has a specific, organized structure with a

large number of codons to provide redundancy; that is, several codons may specify the same amino acid.”

“The expanded genetic code is so universal that there is strong evidence that all life on Earth had a single origin in the universal code before the last universal common ancestor evolved,” he said. “This universal genetic code has been operating for the last 4 billion years and has remained unchanged since it was perfected.”

### Information system of life

To simply explain the origin of the genetic code, Chatterjee compares it to the evolution of personal computing – ironic, since the idea of computing originally came from trying to imitate information processing in living systems. First came Apple II, the first Apple computer. Then Macintosh computers built upon the Apple II by adding a graphical interface.

Today, we have iPhones, which allow us to carry more information in our pockets than NASA had during the Apollo missions. As the computer systems have been modified and refined, so has the information processing on them – just as the genetic code has been modified and refined with the increasing complexity of the lifeforms it comprises.

“However, the analogy ends there,” Chatterjee said. “We know very well that in 50 years, this iPhone will be obsolete. But once life’s computing machinery and its software fully evolved, they have remained the same for the last 4 billion years. Isn’t that amazing?”

Chatterjee and Yadav point out that life is more sophisticated than any manmade computer where the software/hardware dichotomy is blurred and integrated. They find this computer analogy too simplistic.

“Both the informational (RNA/DNA) and functional polymers (proteins) in the translational machinery can be viewed as highly mobile nanobots, which are fully equipped with both the information and the material needed to accomplish their task,” Chatterjee said. “These nanobots ‘know’ how to put themselves together by self-assembly or by cooperation with other molecules.”

Information-directed mRNA and protein synthesis are remarkable feats of early protocells. All of the information is stored in RNA genomes, and when a new protein or mRNA is needed, the information is read and used to direct its construction. Some essential proteins, which perform central tasks, remain unchanged for billions of years.

“The beauty of this information system of life is that if there is any minor spelling mistake in A, U, C and G during translation in protein synthesis, this mistake – called mutation – will create variation among population: the raw material for Darwinian natural selection,” Chatterjee said. “Because of this occasional spelling mistake in the software during the last 4 billion years, today we see the biodiversity of life. However, the genetic code remains unchanged.”

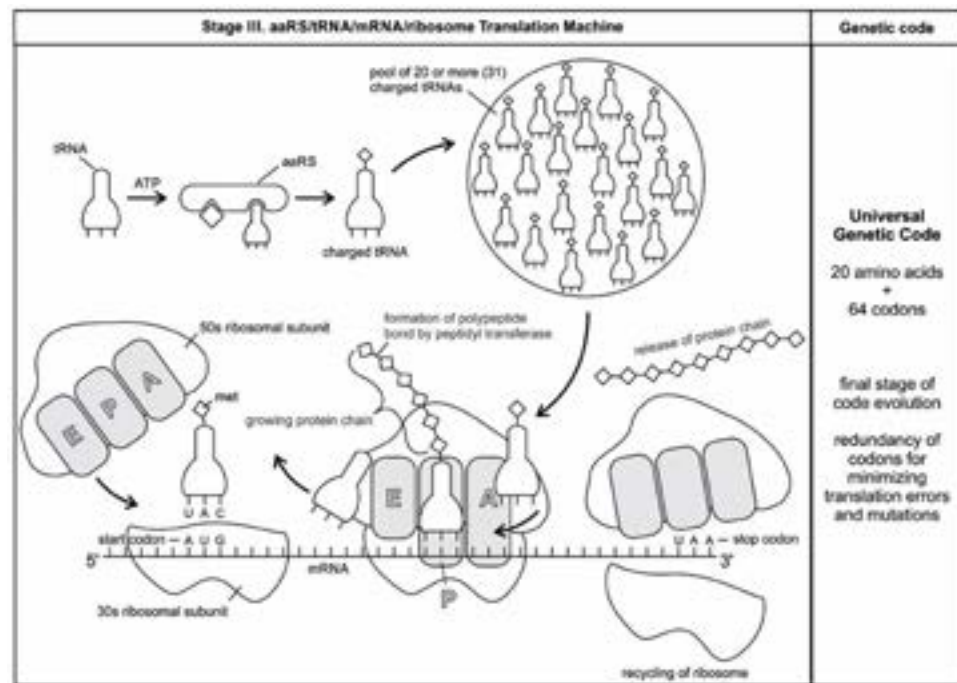
Proteins, Chatterjee said, are regarded as one of the “nanobots” of a cell. They do most of the work – such as controlling metabolism, transport, communication, structure, catalysts and many aspects of cell function – and they are constructed for many different functions. With the availability of proteins, there was a gradual evolution of the components of protocells.

“Life is more than a computer,” Chatterjee said. “Unlike computers, life creates its own custom-made components. No computer can achieve this remarkable feat. Thus, a significant part of the process for creating an organism’s components is essentially bootstrapped from its own DNA and mRNA. An early protocell innovated the most powerful technology ever created on this planet.”

After spending more than 10 years investigating the origins of life, Chatterjee is proud to have found a potential answer to one of mankind’s biggest questions, but he emphasizes that this information system analogy is not the complete story.

“Life is the most sophisticated and durable computer system in the universe, which can create its own copy,” he said. “In our computers, we have to upgrade our software every year or so and buy a new model every few years. But for life, the code was so well designed by evolution and became so near foolproof, and the translation machine so sophisticated, that they did not need any upgrading; they are still working perfectly.”

*The final, aaRS/tRNA/mRNA/ribosome translation machine. tRNA delivers amino acids to ribosomes that serve as the sites of protein synthesis. Each ribosome has a large 50S subunit and a small 30S subunit that join together at the beginning of decoding of mRNA to synthesize a protein chain from amino acids carried by a tRNA. The correct tRNA enters the A site of the ribosome and the appropriate amino acid is incorporated into the growing peptide chain, which transfers from tRNA in the P site to the tRNA of A site. As the ribosome moves, both tRNAs and mRNA then shift to the E site. Each newly translated amino acid is then added to a growing protein chain until the ribosome completes the protein synthesis. At this stage, the universal genetic code is optimized with 20 amino acids for 64 codons, including start and stop codons. The translation is highly efficient, and redundancy minimizes the translation errors and mutations.*



# ALUMNI PROFILE

## SALLY SHELTON

*Associate Chair and Graduate Adviser of the  
Heritage and Museum of Sciences Program*



### **Could you tell us about some of the institutions you've been a part of since graduating from Tech?**

After TTU, I went to Austin, where I worked first at the Austin Nature Center, then as Assistant Conservator at Texas Memorial Museum, University of Texas. During that time, I went to the University of Cambridge for several months to earn a post-graduate diploma in Geological Conservation. I went from there to the San Diego Natural History Museum, where I was Director of Collections Care and Conservation. From there, it was off to the National Museum of Natural History, Smithsonian Institution, to work in the Directorate of Research and Collections as Collections (not Corrections) Officer. I left DC after 10 years to co-direct the construction of a dedicated collections and repository center at the Museum of Geology, South Dakota School of Mines and Technology (SDSMT). Now I have come full circle back to TTU as Associate Chair and Graduate Advisor of the Heritage and Museum Sciences program, as well as Associate Professor of Practice.

At SDSMT, I oversaw the construction of the Paleontology Research Laboratory, a building dedicated to collections care and management for a collection of over 500,000 specimens, artifacts, and archives. I wrote a completely new collections management policy and wrote or co-wrote all the other core documents. In addition, I was a faculty member in the Department of Geology and Geological Engineering, where I taught two museum courses (Collections/Conservation and Exhibits/Public Programs), which were co-listed with the History certificate program at Black Hills State University. I also developed a new course in Paleontology Resource Management, one of the first in the US, which was co-taught with Ogalala Lakota College for several semesters. This course incorporated collections management principles, Federal and tribal laws and policies, and practical training to provide a better background for students going into resource monitoring and mitigation positions with agencies and private contractors. I was also the tribal liaison for issues arising from paleontological resources on (primarily) Lakota lands, and taught a paraprofessional monitoring course for Cheyenne River Reservation for several years.

### **Any specific projects/accomplishments of which you are particularly proud?**

I have led successful subsequent American Alliance for Museums accreditation efforts for the San Diego Natural History Museum and the National Museum of Natural History, but I am most proud of directing the Museum of Geology, SDSMT, to its first-ever AAM accreditation, with flying colors. There were no adverse findings and nothing to correct. I have also served as President of the Society for the Preservation of Natural History Collections, as well as Chair of the AAM Advisory Board for the Museum Assessment Program (MAP). I am also a panel reviewer for the Museums for America grant program, Institute of Museum and Library Services. I was awarded the Dudley Wilkinson Award by the Registrars Committee of AAM for career achievements and service in 2014. All of these are due to the TTU Museum graduate program's training in both expertise and professionalism.

### **Do you have any specific memories from your years as a grad student at the museum?**

I can still remember my delighted amazement as an undergraduate when I discovered that one could, indeed, major in museums. Once I entered the TTU program, I never looked back and have worked continuously in the field ever since. My best memories of the grad program are the practical experiences I was privileged to have, from collections management to running planetarium shows, and the ways in which these experiences reinforced the classroom learning.

### **Thinking back about the grad program, any specific classes, people, work experiences etc that have stuck with you and informed your current role in the museum field?**

Collections management changed my life. Once I got involved in this field, I never wanted to do anything else. Finding out how complex and how necessary collections care and conservation are to the responsible uses of collections, from exhibition to education to research, gave me a focus for my future. But I also benefited from working in the education program and honing my teaching and outreach skills so that I could teach any age group, any day, almost any topic. The blend of collections work and education work has been perfect for me, and has taken me to many places and introduced me to the best community of colleagues anyone could have.

### **How do you view the grad program now as a faculty member as opposed to when you were a student?**

I think that the program has added great depth and relevance through the Heritage Management option. As a faculty member, I want to be sure that our students graduate with the professional skills and expertise to handle documenting, collecting, and communicating the important issues of our times. This is a complex time in our history, and museums will be the holders of the records of this time for the future. Our students will be the ones to carry the history and legacy forward, and it is a rare privilege to be part of their education

### **Anything else you'd like to mention about yourself, TTU, or anything else?**

After all the museums I have worked in, surveyed, consulted with, and helped with, the Museum of Texas Tech University still feels like the best. The combination of strong collections, top-flight researchers, dedicated faculty and staff, and brilliant students is so strong. It was the first museum I ever went to as a child, back when it was still in Holden Hall, and I look forward to every day working for it now.

# BUILDING A FUTURE FOR THE MUSEUM

Last year, the Museum of Texas Tech University celebrated 90 years of history, education, and excellence. Today, we look to the future and the limitless opportunities that exist. The museum is a multifaceted, cultural powerhouse with six impressive collections, Moody Planetarium, internationally recognized Natural Science Research Laboratory, Lubbock Lake Landmark, and the Heritage and Museum Sciences Master of Arts Program. Under the leadership of the museum's new executive director, it is our mission to propel the museum forward into its next 90 years.

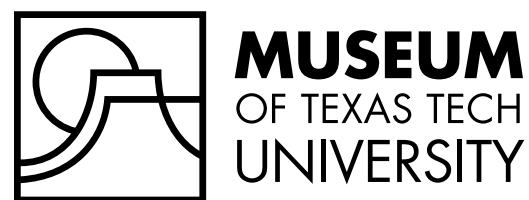
We want you to be a part of the future of the museum!

Your generosity and kindness over the years has been vital to our success and allowed us to create beautiful exhibitions, expand our facilities, and grow culturally and educationally. With your continued support we can develop new, thought provoking, and extraordinary exhibitions, acquire and restore precious artifacts, and build exceptional educational programs that strengthen our community. Your generosity ensures the success of our students and the future of the museum profession and allows the museum to extend its reach beyond the West Texas region.

To donate today, visit [www.give2tech.com](http://www.give2tech.com) and click 'Give Online.' You can search 'museum' and select the area you feel most strongly to give to from special projects and exhibits to scholarships for heritage and museum sciences students to general operations and support.

The museum is a special place with incredible possibilities and with you, the possibilities are endless.

For more information, questions, or to donate over the phone, please call 806.742.2442.



TTTTT

To learn more about the museum visit:

<https://www.depts.ttu.edu/museumttu/>

TTTTT

# ASSOCIATION PROFILE

## CAROL MCWHORTER

CH Foundation Emeritus Representative

Active Member: 35 years



### How did you first get involved with the museum?

My first engagement with the Museum of Texas Tech University was at Holden Hall, the museum's original home. At 10 years of age, my mother enrolled me in a youth art class. At that time, Peter Hurd was painting the entry in the rotunda. It was an exciting experience which also led to piano lessons and recitals in that building. As an adult, during creation of the Museum of Texas Tech University on 4th Street, I've had the thrilling opportunity to be involved in many committees, attend exciting exhibits, meet incredible artists and watch the beautiful new museum building and campus grow.

### Where did you work before retirement?

I was Director of Advertising Sales and Marketing at the Lubbock Avalanche-Journal from 1997-2005. I retired from a 30-year A-J career from 1975-2005.

### Tell us about your family.

My husband is Owen (Mac) McWhorter, who I met while at the A-J. I have one son, Chris and three daughters, Dawn, Meghan, and Kathleen. I have five grandsons, one granddaughter, and three great grandchildren - one boy and two girls. (I'd love to tell you more about the adventures.)

### What activities have you been involved with in the Lubbock community?

Since retirement I've enjoyed the chance to volunteer! I'm currently a member of the Public Art Committee (UPAC) at the Texas Tech University System and also the Texas Tech University Friends of Music Board of Directors. I am President Emeritus of the CH Foundation Board of Trustees since 2014, serving as a Trustee since 2005; Past President of the Louise Hopkins Underwood Center for the Arts (LHUCA), 2009-2011; LHUCA Board 2008-15; Chairman, Women of Excellence Awards, 1991-1992, YWCA.; Chairman, Cattle Baron's Ball, American Cancer Society, 1990; Chairman, 1988 Lubbock Arts Festival; Cultural Affairs Council; Lubbock Chamber of Commerce; and Trustee, Museum of Texas Tech University, 1992-2005.

### What have you enjoyed the most about serving on the museum board?

There is sincere commitment from board members as noted by good conversation, creative thinking, responsible attendance at meetings and museum events!

### What are your interests and hobbies?

I have always had a passion for travel. Among other trips, I have traveled to China and Russia with my husband and parents, Bill and Mildred McKelvy. We traveled together to Israel as a family. Mac and I traveled to Paris five times for our anniversary. I have always love fishing, especially catch and release fly fishing in Montana and northern New Mexico. I love music and art and hope to re-engage with both!

### What do you enjoy most about museums?

Since I was introduced as a young child with my parents at Holden (Hall), it's just a river that runs through my life. It's very entrenched in me. It's part of me.

# SUPPORT THE MUSEUM ASSOCIATION

The Museum Association is the support organization for the Museum of Texas Tech University, providing both funding and volunteers. Your membership helps by:

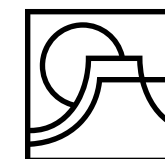
- Providing exciting and educational exhibitions and programs to the region
- Preserving and expanding the Museum's collections for future generations
- Funding for traveling exhibitions

Your membership is also your ticket to an array of private, members-only events including exhibition opening, gallery talks, receptions, travel opportunities and discounts at the Museum Gift Shop.

The Museum of Texas Tech University Association began 90 years ago when a group of visionary citizens interested in forming a museum met to discuss the need to collect and preserve the art, culture, and history of the region. That vision has been realized as the Museum, through its collections, tells the stories of the people, creatures, and things that have defined our region and our place in the world for millions of years. Your membership in the Association supports the exhibitions, educational programs, and outreach activities that make the Museum a special place.

**For more information about Association membership go to [www.mottua.org](http://www.mottua.org) or call (806) 742-2443.**

**Appeal Code: TTU21DOMMUSEU**



MUSEUM OF TEXAS  
TECH UNIVERSITY  
ASSOCIATION

**Yes! I want to become a member in the Museum Association at the following level:**

- |  |  |
|--|--|
| <input type="checkbox"/> Director's Circle \$1,000 | <input type="checkbox"/> Patron \$150          |
| <input type="checkbox"/> Curator \$500             | <input type="checkbox"/> Museum League \$75    |
| <input type="checkbox"/> Benefactor \$250          | <input type="checkbox"/> Friends & Family \$50 |

Mr.  Mrs.  Dr.  Other \_\_\_\_\_

Name(s) as they should appear on MoTTUA cards:

Spouse (if applicable) \_\_\_\_\_

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City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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This is a gift membership from: \_\_\_\_\_

### Method of Payment

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(please make checks payable to Museum of TTU Association)

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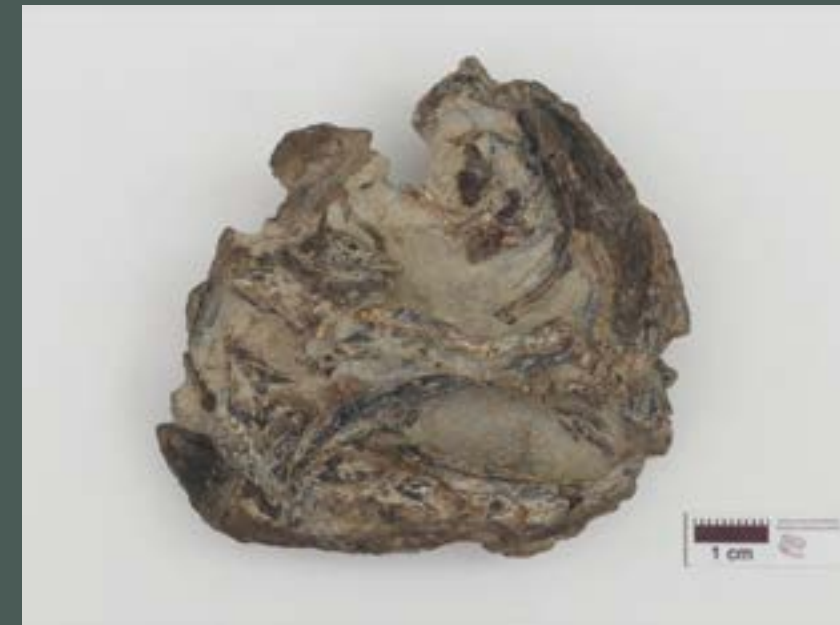
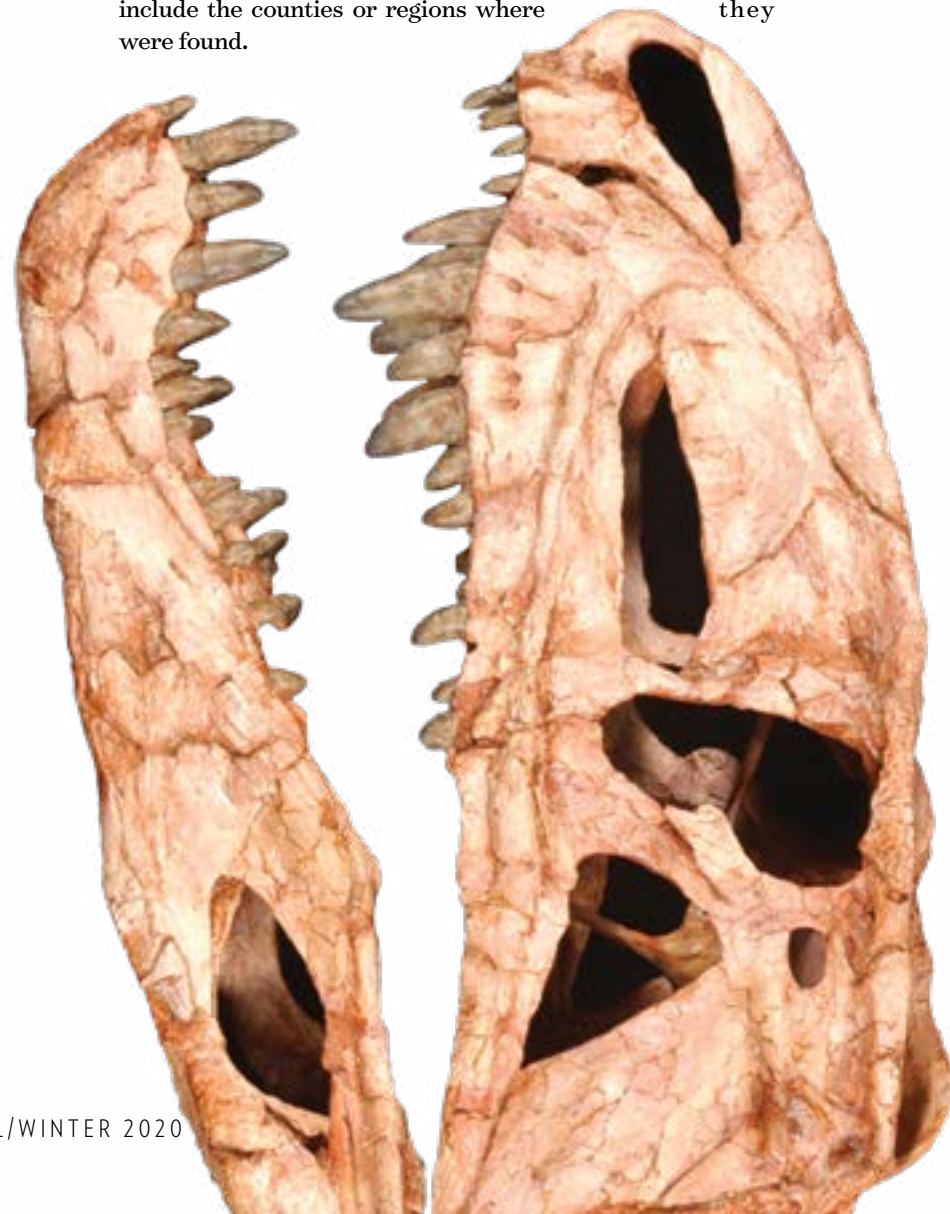
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**TTU21DOMMUSEU**

# EXPLORING PALEONTOLOGY *HOLOTYPES*

Within the collections of the Paleontology Division at the Museum of Texas Tech University are an interesting grouping of 16 holotype specimens. Holotypes are essentially the first specimen found of a new species and are also used to name the species. The 16 species you will read about will include the counties or regions where they were found.



Specimen TTU-P09210: the anterior portion of a skull, with part of the dentary attached.



Specimen TTU-P09168: skull.

## *Antarctiberyx seymouri*

Class-Osteichthyes  
Order-Beryciformes  
Family-Trachichthyidae  
Genus-*Antarctiberyx*  
Species-*seymouri*  
Locality-MOTT VPL 3398.  
Region-Seymour Island, Antarctica.  
Stratigraphy-Lopez de Bertodano Formation.  
Age-Maastrichtian, Late Cretaceous.  
Collectors-S. Chatterjee and B. J. Small, 1985.  
Etymology-The generic name is composed of *Antarcti* for the locality, Antarctica, and *beryx* - a fish (Latin). The species name *seymouri* is for the type locality of Seymour Island.

## *Rileymillerus cosgriffi*

Class-Amphibia  
Order-Temnospondyli  
Suborder-Stereospondyli  
Family-not resolved  
Genus-*Rileymillerus*  
Species-*cosgriffi*  
Locality-MOTT VPL 3624.  
Region-Garza County, Texas.  
Stratigraphy- Tecovas Formation, Dockum Group.  
Age-Norian, Triassic.  
Collectors-S. Chatterjee and Field Crew, 1982  
Etymology-The generic name refers to Riley C. Miller, who generously permitted the junior author to collect at the Post Quarry. The species is named for the late John Cosgriff, a lifelong student of Triassic temnospondyls.



Specimen TTU-P09219: cervical vertebrae.

***Mortunereria seymourensis***

Class-Reptilia  
 Order-Plesiosauria  
 Family-Cryptoclididae  
 Genus-*Mortunereria*  
 Species-*seymourensis*  
 Locality-MOTT VPL 3399.  
 Region-Seymour Island, Antarctica.  
 Stratigraphy-Lopez de Bertodano Formation.  
 Age-Maastrichtian, Late Cretaceous.  
 Collectors-S. Chatterjee and B. J. Small, 1985.

Etymology-The generic names, *Turneria* and the replacement name, *Mortunereria*, were both proposed in “honor of Dr. Mort D. Turner for his keen interest in the Seymour Island project.” The species name *seymourensis* is for the type locality on Seymour Island, and the Latin suffix -ensis, from or belonging to.



Specimen TTU-P00539: partial skull lacking premaxilla.

***Wannia scurriensis***

Class-Archosauriformes  
 Order-Phytosauria  
 Family-Parasuchidae  
 Genus-*Wannia*  
 Species-*scurriensis*  
 Locality-MOTT VPL 0694.  
 Region-Scurry County, Texas.  
 Stratigraphy-Santa Rosa Formation, Dockum Group.  
 Age-Late Carnian, Triassic.  
 Collectors-J. Clark, 1937.

Etymology-The new generic name was in honor of Wann Langston, Texas Memorial Museum, who originally described and named the taxon while he was at TTU. The species name is in reference to Scurry County where the specimen was discovered.



Specimen TTU-P10076: skull.

***Machaeroprotopus lottorum***

Clade-Archosauriformes  
 Order-Phytosauria  
 Family-Parasuchidae  
 Genus-*Machaeroprotopus*  
 Species-*lottorum*  
 Locality-MOTT VPL 3870.  
 Region-Garza County, Texas.  
 Stratigraphy-Bull Canyon Formation, Dockum Group.  
 Age-Norian, Triassic.  
 Collector-D. Cunningham, 2001.

Etymology-The species name is in honor of John Lott and Patricia Lott Kirkpatrick for their support.



Specimen TTU-P15873: osteoderm.

***Tecovasuchus chatterjeei***

Clade-Aetosauria  
 Family-Stagonolepididae  
 Genus-*Tecovasuchus*  
 Species-*chatterjeei*  
 Locality-MOTT VPL 3621.  
 Region-Oldham County, Texas.  
 Stratigraphy-Tecovas Formation, Dockum Group.  
 Age-Norian, Triassic.  
 Collector-W. Langston, Jr., 1945.

Etymology-The generic name is for the Tecovas Formation, from which all currently known material is derived; the specific epithet honors Dr. Sankar Chatterjee for his guidance as our mentor and his contributions to Triassic vertebrate paleontology.





***Desmatosuchus smalli***

Clade-Aetosauria  
 Family-Stagonolepididae  
 Genus-*Desmatosuchus*  
 Species-*smalli*  
 Locality-MOTT VPL 3624.  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-S. Chatterjee and Field Crew, 1984.  
 Etymology-The species name honors Bryan Small for his work with aetosaurs.

Specimen TTU-P09024: skull.



***Chatterjeea elegans***

Clade-Paracrocodylomorpha  
 Family-Shuvosauridae  
 Genus-*Chatterjeea*  
 Species-*elegans*  
 Locality-MOTT VPL 3624.  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-S. Chatterjee and Field Crew,  
 1980-1985.

Etymology-The genus is named after Professor Sankar Chatterjee, discoverer of the holotypic material. The species epithet is from the Latin elegans, meaning very fine or beautiful.

Specimen TTU-P09000: sacral vertebrae.



***Shuvosaurus inexpectatus***

Clade-Paracrocodylomorpha  
 Family-Shuvosauridae  
 Genus-*Shuvosaurus*  
 Species-*inexpectatus*  
 Locality-MOTT VPL 3624  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-S. Chatterjee and Field Crew, 1984.  
 Etymology-The generic name is given in recognition of Dr. Chatterjee's son, Shuvo, who discovered the material during preparation. Specific name implies the unexpected find of an ornithomimosaur in the Late Triassic.

Specimen TTU-P09280: skull.



***Postosuchus kirkpatricki***

Family-Rauisuchidae  
 Genus-*Postosuchus*  
 Species-*kirkpatricki*  
 Locality-MOTT VPL 3624.  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-S. Chatterjee and Field Crew, 1983.  
 Etymology-The generic name refers to the town of Post, near which the type material was discovered; the specific name is given in honour of Mr. and Mrs. Kirkpatrick for their help and hospitality during my field work.

Specimen TTU-P09000: skull.



***Technosaurus smalli***

Clade-Silesauridae  
 Genus-*Technosaurus*  
 Species-*smalli*  
 Locality-MOTT VPL 3624.  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-S. Chatterjee and Field Crew, 1983.  
 Etymology-The generic name is given in honor of Texas Tech University, the specific name in recognition of the generous help afforded by Bryan J. Small in the field and laboratory.

Specimen TTU-P09021: right dentary.



***Polaronis gregorii***

Order-Gaviiformes  
 Family-Vegaviidae  
 Genus-*Polaronis*  
 Species-*gregorii*  
 Locality-MOTT VPL 3399.  
 Region-Seymour Island, Antarctica.  
 Stratigraphy-Sandwich Bluff Member,  
 Lopez de Bertodano Formation.  
 Age-Maastrichtian, Cretaceous.  
 Collector-B. J. Small, 1983  
 Etymology- *Polar*, referring to Antarctica where it was found; *ornis* (Latin): bird; *gregorii*: in honor of Joseph T. Gregory for his contributions to vertebrate paleontology.

Specimen TTU-P09265: skull.



***Protoavis texensis***

Class-Aves  
 Order-Protoaviformes  
 Family-Protoavidae  
 Genus-*Protoavis*  
 Species-*texensis*  
 Locality-MOTT VPL 3624.  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-B. J. Small, 1983.  
 Etymology-The generic name refers to Latin for "first bird." The specific name was given in honor of the State of Texas where the specimen was discovered; and the Latin suffix -ensis, from or belonging to.

Specimen TTU-P09200: skull assemblage



***Pachygenelus milleri***

Class-Synapsida  
 Order-Therapsida  
 Family-Tritheledontidae  
 Genus-*Pachygenelus*  
 Species-*milleri*  
 Locality-MOTT VPL 3624.  
 Region-Garza County, Texas.  
 Stratigraphy-Tecovas Formation,  
 Dockum Group.  
 Age-Norian, Triassic.  
 Collector-S. Chatterjee and Field Crew, 1982  
 Etymology- The specific name is given in recognition of R. C. Miller and his wife for their help and hospitality during my fieldwork.

Specimen TTU-P09020: right dentary, juvenile.



***Capromeryx minor***

Class-Mammalia  
 Order-Artiodactyla  
 Family-Antilocapridae  
 Genus-*Capromeryx*  
 Species-*minor*  
 Locality-MOTT VPL 1400.  
 Region-Lubbock County, Texas.  
 Stratigraphy-Late Yarmouthian Interglacial Stage.  
 Age-Irvingtonian NALMA (North American Land Mammal Age).  
 Collector-West Texas Museum and Texas Tech Geology Field Crews, pre-1942.

Etymology- There was no reference to the etymology for the species name; however, Meade (1942) described the anterior beam of the horn core as much more reduced than in *Capromeryx mexicana*, *C. minor*, and *C. furcifer*. Also, all this group’s members are sometimes known as dwarf pronghorn, and are very small, extinct species.

***Chimaera zangerli***

Class-Chondrichthyes  
 Order-Chimaeriformes  
 Family-Chimaeridae  
 Genus-*Chimaera*  
 Species-*zangerli*  
 Locality-MOTT VPL 3397.  
 Region-Seymour Island, Antarctica.  
 Stratigraphy-Lopez de Bertodano Formation.  
 Age-Maastrichtian, Late Cretaceous.  
 Collector-S. Chatterjee and B. J. Small, 1984.

Etymology- The species is named for Rainer Zangerl of the Field Museum of Natural History, Chicago.



***Soumyasaurus aenigmaticus***

Clade-Dinosauriformes  
 Order-Draconiformes  
 Family-Silesauridae  
 Genus-*Soumyasaurus*  
 Species-*aenigmaticus*  
 Locality-MOTT VPL 3624.  
 Region- Garza County, Texas.  
 Stratigraphy- Tecovas Formation, Dockum Group.  
 Age- Norian, Triassic.  
 Collectors- S. Chatterjee, 1993.

Etymology- Named by Dr. Sankar Chatterjee in honor of his eldest son, Soumya. Specific name represents the nature of the specimen, derived from the Latin word “aenigma” that means “enigma or riddle”.

Specimen TTU-P11254b: dentary.

If you enjoyed this information, then please follow the link below to learn more about our holotypes, pages 50 through 56. We, however, urge you to read more of the publication as it highlights all the research conducted by Texas Tech University pertaining to holotype specimens.

<http://www.depts.ttu.edu/nsrl/publications/downloads/SP74.pdf>



Specimen TTU-P09413: palatine roof plate.

# UPCOMING EXHIBITS

## BIODIVERSITY OF THE LLANO ESTACADO

A new gallery at the Texas Tech Museum, Biodiversity of the Llano Estacado, will be opening soon. The gallery will feature an in-depth depiction of the seven major habitats – both natural and man-made – of the Llano Estacado region: short- and mixed-grass prairies; canyon, breaks, and draws; playas; salinas; sand dunes and sand hills; agricultural lands; and urban areas. The variety of wildlife species that occupy each of these habitats will be highlighted.

Formed 23 million years ago and encompassing 50,000 square miles of what is now northwestern Texas and eastern New Mexico, the Llano Estacado is one of the largest plateaus on the North American continent. The gallery explores the history of the region from its geological formation, to its first occupation by humans more than 12,000 years ago, to present day, and illustrates the changing influences and relationships of humans and nature through time. The gallery will be populated with numerous museum specimens of mammals, birds, and reptiles, and creative graphic designs and stunning photographs will allow the visitor to virtually walk through the various landscapes of the Llano. Touchscreen computers will allow visitors to dig deeper into information about the geologic and human history of the region. Current Texas Tech-based research in biodiversity, natural resource management, human-environmental interactions, and climate change will be profiled in changing modular components.

We hope visitors will come away with an appreciation for the unique value of the landscapes and wildlife of this region and an awareness of the need to preserve these resources for future generations.

*This gallery was funded by a grant from the Helen Jones Foundation, Inc., to Gary Morgan, Eileen Johnson, Jill Hoffman, and Robert Bradley.*



## SUMPTUOUS STITCHES AND TINY TREASURES

*Sumptuous Stitches and Tiny Treasures*, an outstanding exhibition of needlework and needlework tools at The Museum of Texas Tech University, Lubbock, TX (Delayed due to COVID-19. Check our website for opening date.)

Drawn from the Museum's collection of Clothing and Textiles, the largest at a university museum in the country, the pieces will show the exquisite workmanship of needlework created from the time of James I of England to the present. Among the needlework are schoolgirl pieces for which two of the schools have recently been discovered. Among the hundreds of beautiful needlework tools planned for exhibit are a large assemblage of seldom seen 18th century knotting shuttles and an array of stunning gold, silver, and brass pieces. These tiny treasures were often given as tokens of love or as awards for exceptional needlework. The innovative and beautiful ways turtles, frogs, penguins, lambs, elephants, pigs, ships and tourist attractions have been incorporated into needlework tools have to be seen to be enjoyed.

A detailed exhibition catalog of the same name will be published and available for purchase online.



For further information contact Dr. Marian Ann Montgomery, Curator of Clothing and Textiles, at [marian.ann.montgomery@ttu.edu](mailto:marian.ann.montgomery@ttu.edu) or (806) 834-5146.

Visit the webpage for Clothing and Textiles for the most up-to-date information:

<http://www.depts.ttu.edu/museumttu/collections/clothing-textiles/index.php>

## EXHIBITION CALENDAR

Due to the COVID-19 pandemic and the extended closure of the museum, a current calendar of exhibitions is not available. Please visit [museum.ttu.edu](http://museum.ttu.edu) for the most recent updates and follow us on social media. If you have questions please email [museum.texastech@ttu.edu](mailto:museum.texastech@ttu.edu).





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