123rd Annual Meeting of the Texas Academy of Science

February 28th – 29th, 2020

Stephen F. Austin State University
1936 North St.
Nacogdoches, Texas

Official Program

About the Texas Academy of Science

History

First founded by teachers as the Academy of Science in Texas in 1880, the organization as we know it now emerged around 1929 and included a physicist, a botanist, a mathematician and two biologists as its founding members. Now, TAS publishes a peer-reviewed journal (The Texas Journal of Science since 1949), conducts an annual meeting that highlights research across 17 sections across the sciences, provides substantial funding opportunities for students (~$25,000 awarded annually) and facilitates expert testimony on policy issues related to STEM or science education. TAS membership approaches 600 individuals, with a large portion of the membership as students.

Mission

As part of its overall mission, the Texas Academy of Science promotes scientific research in Texas colleges and universities, encourages research as a part of student learning and enhances the professional development of its professional and student members. TAS possesses a complex, intriguing and long-standing educational mission.

Strategic Planning

The Texas Academy of Science (TAS) Board of Directors approved a vision for a 5-year Strategic Plan: “to increase the visibility and effectiveness of TAS in promoting strong science in Texas.” As part of that initiative, the Academy seeks to reach out to foundations and organizations that support and benefit the Texas science community. We believe that a number of opportunities exist for strategic partnerships that could bolster the impact of organizations that raise the profile of science in Texas. Our ultimate goal will be to make TAS the premier state academy in the United States; however, this cannot be accomplished without funding from both individuals and corporations. It should also be noted that 100% of the contributions given to TAS for student awards goes directly to the award.

the Weches Formation in Nacogdoches County, Texas. Study material consists of fourteen previously collected shark teeth and ten recently collected teeth recovered from outcrops along Maroney Drive and the southernmost portion of Lake Nacogdoches. Morphological features of importance included serrations, cusplets, striations on the lingual side of the crown, cutting edges, and relative proportions of the root and crown. Teeth were identified to the genus level based on comparisions with previously described and illustrated Eocene selachian faunas. As a result, five genera of lamniform and carcharhiniform sharks were recognized, including Striatolamia, Carcharias, Brachycarcharias, Carcharhinus, and Galeorhinus. A diverse middle Eocene shark fauna appears to be represented by these teeth, given the relatively high number of genera represented within the relatively small sample size.

11:45 029.223 G **Paleontologic and Stratigraphic Analysis of the Harrisburg Member of the Kaibab Formation in North Central Arizona**, *Zachery Ted Case, Stephen F. Austin State University; R. LaRell Nielson, Stephen F. Austin State University*
In the upper stratigraphic units of the Harrisburg Member of the Kaibab Formation on the north Kaibab Plateau in north central Arizona, a silicified faunal assemblage of nautiloids, ammonites, gastropods, brachiopods, bivalves, and trilobites are present. At some locations intense bioturbation has occurred. Stratigraphic analysis of the Harrisburg Member contains 9 stratigraphic units. The contact between the Fossil Mountain Member and the Harrisburg Member is noted by a change from a thick-bedded fossiliferous dolostone, to a thin-bedded dolostone of unit 1. Unit 2 is a thin-bedded dolostone. A sandstone containing well-rounded quarts grains makes up unit 3. The upper contact of unit 3 is marked by a weathered surface and represents a disconformity suggesting subaerial exposure. A red siltstone makes up unit 4. A fossiliferous dolostone with a white siliceous cap makes up unit 5. Above the fossiliferous dolostone is a covered slope representing unit 6. Unit 7 is a thin-bedded fossiliferous dolostone that contains silicified nautiloids, ammonites, and brachiopods along with burrows. Unit 8 is a covered slope. Unit 9 is the uppermost unit and contains a fossiliferous dolostone with silicified fossils. Above the Harrisburg Member is a disconformity filled by the Rock Canyon Conglomerate and Triassic Moenkopi Formation. Deposition of the lower part of the Harrisburg Member occurred on a marine shelf during a regression representing the end of the lower Kaibab sequence. Units five through nine were deposited during a transgression, on a low energy marine shelf representing a second transgression and a younger sequence.

12:00 029.224 G **Synthesis of paleoclimate, paleoecological, and archaeological data for central Texas over the last 20,000 years**, *Stacie Skwarcan, University of Texas at Austin*
The Edwards Plateau in central Texas has been the subject of extensive paleoclimatic, paleoecological, and archaeological investigation since the mid-twentieth century, with the efforts of this work yielding over 700 publications. I am completing a compilation and synthesis of paleoclimate data relevant to the entire state of Texas and of paleoecological and archaeological data from the Edwards and Stockton plateaus that will provide a synthesis of the work that has been done regarding the climate, ecology, and human presence on the Edwards Plateau over the past 20,000 years. This type of compilation will aid in the identification of spatial or temporal gaps in knowledge where future work can be focused to answer questions including how humans, plants, and animals responded to past changes in climate from the late Pleistocene through the Holocene. Additionally, sites on the Edwards Plateau are uniquely positioned to record evidence of longitudinal shifts in the biogeographic and climatic boundary historically associated with the 100th Meridian, which has historically been recognized as a dividing line between the drier western United States and wetter eastern United States. If recent evidence of an eastward shift in that boundary is valid, and if an eastward shift continues, it may cause large population centers currently to the east of the boundary (e.g., Austin and San Antonio) to become more water-stressed. Determining whether and/or how this boundary has shifted in the past has the potential to aid in planning for future management challenges of water and other natural resources.

12:15 029.225 G **The History of the Nacogdoches Oil Field**, *Hannah Chambers, Stephen F. Austin State University*
Although a lesser known oil field, the rich history of the Nacogdoches Oil Field spans more than a century. The first oil discovery in this field was likely made by the local Native Americans who found oil in pools near present-day Oil Springs, Texas. There were various uses for the oil including medicinal applications and water proofing of canoes. In 1866, Lyne T. Barret (1832-1913) with the Melrose Petroleum Oil Company completed the first successful oil well in the Nacogdoches Oil Field. This discovery is most significant because it was also the first successful oil well drilled in the state of Texas. Due to the unrest brought on by reconstruction that followed the Civil War, nearly two decades would pass before the Nacogdoches Oil Field would see any substantial development. By the late 1880's prospectors and small petroleum companies began operations which led to an influx of production in the following years. As other,