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FEATURED INSTITUTION— *By Jerry R. Choate*

Systematics Collections at
Fort Hays State University

Systematists are explorers whose work frequently takes place at the frontier, whether this be the biological frontier, the actual frontier of human domination, or a combination of the two. In this regard, Fort Hays State University is characterized by a frontier spirit exceeded by few academic institutions. Just over 100 years ago, when the area where Hays, Kansas now stands was being settled by German immigrants from the Volga region of Russia (and when several ASC member institutions already were large and established), western Kansas still was inhabited primarily by Cheyenne and Arapaho Indians (although bands of the Kaw, Pawnee, Sioux, Kiowa, and Commanche tribes also made periodic incursions into the region in order to obtain food from the vast herds of bison that roamed the prairies). Frontiersmen crossed the inhospitable plains along the Smoky Hill Trail to settle farther to the west, where the climate was less severe and water was more plentiful. Military installations (including Fort Hays) were established along the Smoky Hill Trail to protect settlers from raiding parties of Indians, and later to protect workers along the route of the Kansas Pacific railroad. Among the more famous (or infamous) persons stationed at Fort Hays were "Buffalo Bill" Cody, General Philip Henry Sheridan, and Lieutenant Colonel George Armstrong Custer. The city of Hays grew up alongside the fort as a watering hole for soldiers and cowboys (it was known for more than a decade as the "Sodom of the Plains"), and was inhabited by the likes of James Butler ("Wild Bill") Hickock and Martha ("Calamity Jane") Canary -- both of whom earned their nicknames while living in Hays.

The spirit of those not-too-distant days still remains on and around the campus of Fort Hays State University. The wagon ruts of the Smoky Hill Trail can be seen on the campus, and the first ever of what were to be widely known as "Boot Hills" is located on a rise less than one mile from the university. Many of the original stone buildings of the town remain (and are appropriately identified) even though Hays has developed into a modern city of more than 16,000 inhabitants. The city even maintains its own herd of bison, immediately adjacent to the campus. The fort (a part of which now serves as a museum) occupies only a small portion of the vast Fort Hays Military Reservation; the remainder was granted to the state in 1900 for use as a college campus, an agricultural experiment station, and a state park. The Western Branch of the Kansas Normal School of Emporia was founded on the reservation in 1902, and the institution became an independent, state tax-supported, liberal and applied arts college in 1914. Even to this day, all of the buildings on the Fort Hays State University campus are constructed of native limestone and the ecological setting is maintained so that it simulates that which existed during the time of settlement of this frontier.

Because Fort Hays State University has had such a short history and is still located near the frontier of academic and intellectual pursuits, its systematics collections are small by the standards of most other ASC member institutions. Nevertheless, the collections are of considerable importance both historically and regionally. The administration at Fort Hays State takes pride in the fact that ours was the only college (until it became a university) to obtain membership in the ASC, and has encouraged our museum personnel to take positions of leadership in promoting the development, proper maintenance, and professional utilization of outstanding research collections at Fort Hays State and at other institutions.

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Historically, the systematics resources at Fort Hays State University developed as three separate museums: the Sternberg Memorial Museum; the Elam Bartholomew Herbarium; and the Museum of the High Plains. At the present time, the three museums remain physically separated although the Elam Bartholomew Herbarium and the Museum of the High Plains are administered jointly. The multi-faceted functions of the museums (graduate education, research, and public service) are performed exceptionally well, given the limited funding and staff available at this relatively small academic institution.

Perhaps in part because of Fort Hays State's relatively small size, there is extensive cooperation and sharing of resources. For example, the University Farm, which is situated immediately adjacent to the campus, encompasses approximately 4000 acres of native range and farmland; this area, together with both the riparian communities along the creek that bisects campus and a remnant of the Mixed Prairie (near campus) that has been protected from disturbance by man and domestic animals since 1902, is widely used as an outdoor laboratory and research area by museum personnel. The same is true for the Hamburg Research Area, a tract of native prairie northwest of Hays on which paleontological research is in progress, and for a modern building on the University Farm which serves as both a skeletal preparation laboratory and a live animal facility. Additionally, museum personnel have access to an outstanding collection of original paintings of prairie plants, which was donated to the university by the Phillips Petroleum Company, and to a collection of approximately 10,000 photographs of habitats at known localities on the Great Plains during various phases of the drought cycle. Finally, the laboratories and other resources of the academic departments of geological and biological sciences are employed in a support capacity in many of the activities of all three museums.

The Sternberg Memorial Museum is best known for the exhibits in its Hall of Paleontology, Hall of Natural History, Hall of Archeology and Ethnology, Hall of History, Hall of Pioneers, and geological display cases. However, it also houses important paleontological research collections consisting of several thousand lots plus 19 holotypes and numerous paratypes and plastotypes. Many of the older specimens were located in various

Fig. 1. South entrance to Sternberg Memorial Museum.

departments and offices before the museum was established in 1926. President W.A. Lewis took an active interest in development of the museum, and (in 1927) encouraged George F. Sternberg (an internationally-known paleontologicl collector) to move to Hays and assume responsibility for its development. Sternberg had been trained in paleontological field work by his father, Charles H. Sternberg, who began his career as a paleontological collector with Edward Drinker Cope and achieved prominence for his work on the Cretaceous of Canada.

During his 34 years at Fort Hays State, Sternberg amassed important collections of Cretaceous mollusks and vertebrates--including outstanding specimens of mosasaurs and plesiosaurs, one of the world's foremost assemblages of flying reptiles, a collection of fossil birds exceeded only by those at Yale University and the American Museum of Natural History, and the world-famous "fish within a fish" -- several of which are holotypes. He

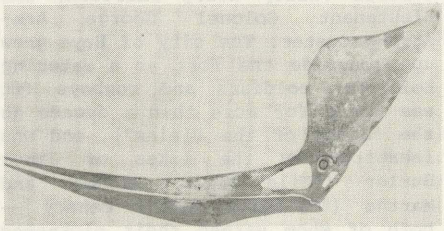

Fig. 2. Holotype of Pteranodon sternbergi Miller, one of the largest of the flying reptiles. The species is noteworthy for its greatly enlarged cranial crest.

augmented these materials with small but important collections of fossil plants and Tertiary vertebrates, especially from the late Cenozoic of Kansas. His successor, Myrl V. Walker, described a number of the taxa previously collected and added to the Cretaceous collections. The current Director of the Sternberg Memorial Museum, Dr. Richard J. Zakrzewski, is recognized for his research on arvicoline rodents, local faunas, and biostratigraphy of the late Pliocene and Pleistocene, and has amassed important collections of late Cenozoic vertebrates from the Great Plains. Additionally, Zakrzewski has accumulated an immense (perhaps 500,000 specimens), as yet unstudied, collection of late Cenozoic mollusks. The paleontological collections are now being recatalogued according to standards set by the Society for Vertebrate Paleontology. Current plans call for implementation of an automated information management system, probably SELGEM, in the near future.

Other persons associated with the museum include: Dr. Frank W. Potter (Curator of Paleobotany), whose current research focuses on evolution of Cretaceous angiosperms; Dr. Michael E. Nelson (Research Associate), who is best known for his stratigraphic and paleontological research in Utah; Dr. Joe Thomasson (Research Associate), who has developed an unusual and important collection of fossilized grass seed which eventually will be deposited in the Sternberg Memorial Museum; and Michael L. Bishop (Associate Curator of Museums), who is responsible for the public education programs of both the Sternberg Memorial Museum and the Museum of the High Plains. Zakrzewski's administrative and curatorial appointment is half-time, and is balanced by a half-time appointment as Associate Professor of Geology; Nelson is Professor and Chairman of the Department of Earth Sciences; Potter has a full-time appointment as Associate Professor of Botany; Thomasson is a member of the Faculty at Black Hills State College in Spearfish, South Dakota; Bishop is the only full-time employee of the Sternberg Memorial Museum. As in museums at many other small academic institutions, much of the labor of curation, preparation, and exhibit maintenance is performed by qualified student assistants. At the present time, six students are engaged in graduate studies involving the paleontological collections of the museum.

The Elam Bartholomew Herbarium is an outgrowth of a collection of plants established in 1929 by Dr. Elam Bartholomew. The herbarium was

curated by Bartholomew until his death in 1934, at which time Dr. Fred W. Albertson (who is best known as a plant ecologist) became Curator. The present Curator, Dr. Howard C. Reynolds, has been in charge of the herbarium since 1957; he has an academic appointment as Professor of Botany.

The herbarium is famous for its original set of exicatti of rust specimens collected and prepared by Bartholomew, who was one of the world's authorities on rust. Many of Bartholomew's exicatti were deposited at Harvard University, but the herbarium retained more than 5000 packets. In addition to this collection, the herbarium contains approximately 16,000 sheets of flowering plants, most of which were collected on the Great Plains; it is an important, regional, research resource. Reynolds' research interests pertain both to the morphology of Cretaceous angiosperms and to the Recent flora of the Mixed Prairie.

Administratively, the Elam Bartholomew Herbarium is one of several divisions of the Museum of the High Plains. In addition to the herbarium, the museum includes collections of arthropods, fishes, amphibians and reptiles, birds, and mammals. These divisions began as departmental collections, some amassed originally for use in teaching and others as a result of research projects. The departmental collections grew rapidly during the 1960's as a result of expeditions to New Zealand, the Pacific Northwest, the Southwest, and throughout the Great Plains. The name "Museum of the High Plains" was first informally applied to the collections during the 1964-65 academic year, and the Museum of the High Plains became formally organized and recognized as a functional entity of Fort Hays State University in 1973. Since then, the museum has developed a nationwide reputation for its research programs and the professional activities of some of its curators. The first and current Director of the Museum of the High Plains is Dr. Jerry R. Choate.

All of the curators in the museum hold full-time academic appointments in the Department of Biological Sciences. Accordingly, much of the technical curatorial work is performed by highly-trained graduate assistants who thereby receive extensive, supervised experience in most aspects of museum curation. At present, 20 students are engaged in graduate research involving the resources of the Museum of the High Plains. Additionally, Robert C. Dowler (an employee of the Association of Systematics Collection's ERDA Registry project) "moonlights" as Associate Curator of the museum and has been instrumental in implementing improved curatorial practices in several divisions of the museum.

The Collection of Arthropods of the museum has been amassed entirely by its Curator (and Professor of Zoology), Dr. Neil A. Walker. The collection consists of two units: one is an invaluable research collection of about 250,000 mites, nearly all of which were collected by Walker in New Zealand; the other is a relatively small collection of representative insects and other arthropods from the Great Plains. The former collection is an outgrowth of Walker's research on euphthiracaroid mites while serving as a consultant to the New Zealand Department of Scientific and Industrial Research. The latter collection is used entirely in teaching.

The Collection of Fishes is curated by Dr. Thomas L. Wenke, whose research interests pertain more to aquatic biology and fisheries than to taxonomic ichthyology; nevertheless, he has developed a small collection (approximately 5000 lots) which is especially rich in taxonomic representation and which also serves as a depository for voucher specimens from a broad array of ichthyological projects. It is hoped that specimen-level data for the collection can be captured, using SELGEM, during the next couple of years. Wenke has an academic appointment as Professor of Zoology.

The Collection of Herptiles is curated by Dr. Eugene D. Fleharty, who did his doctoral research in herpetology but whose research interests now pertain more to mammalian functional ecology and human ecology. Through his efforts, a collection of about 8000 amphibians and reptiles from the western United States was developed. Although the collection now is used primarily as a depository for voucher specimens, it remains a valuable research resource for use by biogeographers because it includes numerous marginal records. Fleharty, together with Dr. Gary K. Hulett (Chairman of the Department of Biological Sciences at Fort Hays State), recently published a book on human ecology and has plans for two more; additionally, he supports plans for future implementation of an automated information management system for the collection. He has an academic appointment as Professor of Zoology.

All of the departmental vertebrate collections now maintained by the Museum of the High Plains initially were curated by Dr. Charles A. Ely. However, with the addition of staff during the past two decades, Ely has been able to concentrate on the Collection of Birds (of which he is Curator). The collection includes approximately 6000 beautifully prepared skins and skeletons, of which about 2000 are from the Mexican state of Chiapas and the remainder are the result of Ely's extensive research on migration in the central flyway of the United States and Mexico. Ely is continuing his research on seasonal movements of birds in a Chiapan rainforest, and maintains a permanent bird-banding station at the boundary line between the Mixed Prairie and the High Plains in Kansas. He has an academic appointment as Professor of Zoology.

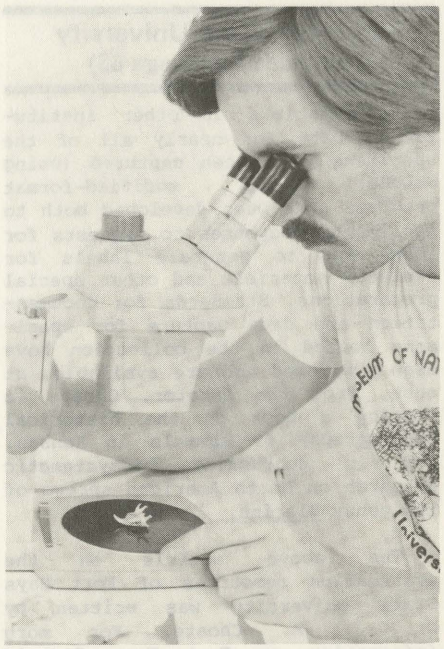

Fig. 3. Graduate student Mark Engstrom examining dental characters in New Mexican populations of the golden-mantled ground squirrel.

In addition to his appointments as Associate Professor of Zoology and Director of the Museum of the High Plains, Dr. Jerry R. Choate also serves as the museum's Curator of Mammals. The collection of mammals was developed in the 1960's, largely under the direction of the present Curator of Herptiles (Fleharty), and now consists of approximately 15,000 well-prepared specimens (including skeletal materials, fluid-preserved specimens, karyotypes, sperm slides, and other special preparations in addition to standard skins with skulls). The present rate of growth is about 2000 specimens per year, nearly all of which are the result of graduate research projects. The collection is especially rich in specimens from the Pacific Northwest, New Mexico, the Great Plains, and southern Mexico, and receives extensive use

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by systematists at other institutions. Data for nearly all of the specimens have been captured (using SELGEM), and modified-format programs have been developed both to facilitate responses to requests for loans and to generate labels for skeletal materials and other special preparations. Standards for documentation and data capture for specimens housed in the collection have been published and are available, at cost, from the Curator. Choate is writing a book on the historical biogeography of mammals in Kansas, and is conducting biosystematic research on North American shrews of the genus Blarina.

The above article on the systematics resources of Fort Hays State University was written by Dr. J. R. Choate. For more information on Fort Hays State's systematics collections or its museum-based graduate programs, write to Dr. Choate at: Museum of the High Plains, Fort Hays State University, Hays, Kansas 67601.