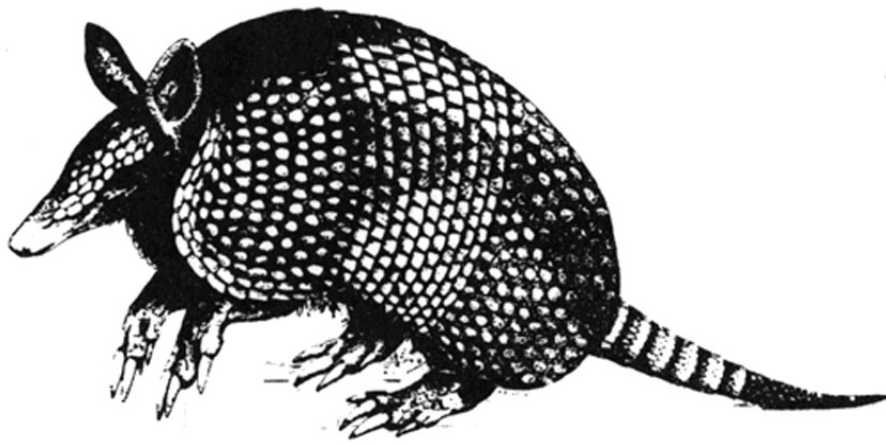


TEXAS SOCIETY OF MAMMALOGISTS



NEWSLETTER

2001

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ANNOUNCEMENTS and BUSINESS

Notes and Acknowledgments from Newsletter Editor, David Ribble

Most of the credit for this year's newsletter goes to Dr. George Baumgardner, a former Newsletter Editor. George graciously agreed to collect (and dog people for it!) member information and put it together in a close-to-finished product while I was out of the country. Sharon Smith and Sylvia Stewart of the Biology Department, Trinity University, helped to put the final touches on the information that George collected. Thanks to all of you for your work during my absence!

Dr. Rollin Baker continues to graciously supply us with his thoughts and comments. I was unable to print all of his contributions due to lack of space, but we will have more to look forward to in many newsletters to come.

This year's newsletter is offered in PDF format via the internet in order to save paper and money (see <http://www.trinity.edu/dribble/tsm/newsletter.htm>). If you would like a hard copy or know of someone that should have a hard copy, please contact me. And as usual, please feel free to contact me should you have any information you would like included in future newsletters (dribble@trinity.edu).

Patronage of the Texas Society of Mammalogists

Please consider becoming a member of the first class of Patrons of our society. Cost is \$100. Contact the Secretary/Treasurer (Ann Maxwell) for details.

Resolutions from the 18th Annual Meeting

Resolution Honoring Dr. Howard McCarley

Whereas, with the death of W. Howard McCarley on May 22, 1999, The Texas Society of Mammalogists lost a devoted member, a major player in the History of Mammalogy in Texas. Due to this untimely death, we the Texas Society of Mammalogists offer the following recommendation, and

Whereas, W. Howard McCarley graduated from Colbert, Oklahoma High School in 1944, and came to Sherman, Texas to attend Austin College initiating a long and fruitful career in this state, and

Whereas, upon completion of his degree from Austin College, he earned his doctorate under W. Frank Blair in 1950 at The University of Texas, contributing a major advancement to the knowledge of the ecological relationships between *Peromyscus leucopus* and *Peromyscus gossypinus* with his dissertation, and

Whereas, he accepted a position as professor of Biology in the Department at Stephen F. Austin State University in Nacogdoches, Texas thereupon beginning his protracted career of educating and influencing many students of biology, and

Whereas, his interest in the biology of the red wolf encouraged a student to salvage a canid that was killed in Cherokee County. This specimen gained some notoriety in that the stench from the specimen resulted in a three-day evacuation of the three-story Science Building on campus. That specimen and several other heads collected behind the house of a wolf trapper and from specimens displayed on various fence posts, served as the initial sample for an extensive study that culminated in the removal of a founder population from the wild. This founder population was the group from which all of the presently existing red wolves came. For his work with the red wolf, he received the DAR Conservation Medal in 1991, and

Whereas, his resignation from the SFA position in 1959 to return to Southeastern Oklahoma State University opened a position that was, with his encouragement, filled by Robert L. Packard, the founder of Texas Society of Mammalogists, and

Whereas, in 1961 he returned to Austin College to complete his career as Professor, Head of the Department and Professor Emeritus upon his retirement in 1991, and

Whereas, he was mentoring students throughout this time and contributing 38 publications to various scientific publications as well as serving as Visiting Professor for 30 summers at the University of Oklahoma Biological Station, and

Whereas, his Natural History of the Vertebrates at the Lake Texoma Oklahoma Biological Station became a classic and many students from this course went on to become outstanding biologists, and

Whereas, the art of roasting dignitaries and ideas is to venture as close to the boundaries of social acceptability as possible without violating the boundary's integrity. Like an artist, Howard McCarley played on the boundaries to paint images in our minds that provided insight, left handed compliments, and wonderful humor, and

Whereas, he will no longer excite us with his biological knowledge, entertain us with his story telling, challenge us with suggestions and warm us with his friendship,

Therefore, be it resolved that the Texas Society of Mammalogists at its 18th Annual Meeting on the 18th –20th of February 2000 at the Texas Tech Campus at Junction recognizes and honors the accomplishments of Dr. Howard McCarley and extends to his family and friends special commendations for the loss of this special person and friend.

Resolution to Honor Mary and Rollin Baker

Whereas, Michigan State University, the science of Mammalogy and human kind were enriched by the existence of Rollin and Mary Baker, and

Whereas, Mary was the ultimate lady and Rollin was the ultimate gentleman, and

Whereas, Rollin procured legal security for mammalogical field activities by marrying the Game Warden's daughter, and

Whereas, "Hoot" created a bond between Mammalogy and ornithology by feeding owl to the Mammalogy field class, and

Whereas, "Hoot" is still bonded with owls and their pellets as monitors of small mammal population dynamics, and

Whereas, Dr. Baker, in an area adjacent to a bar and only with the aid of a gopher trap, collected the only specimen of a mole from Sierra del Carmen, Mexico. We wonder if he was surprised when he checked his traps, and

Whereas, Rollin Baker received his master's degree from Texas A&M under the mentorship of Dr. William B. Davis, and Rollin participated in the early biological survey of what today is Big Bend National Park. His Texas ties are further strengthened by his early employment by Texas Parks and Wildlife, then called the Texas Game and Oyster Commission, and

Whereas, he concluded his career in Mammalogy through retirement to Eagle Lake Texas, where he continues to make significant contributions to our understanding of Texas mammals, and

Whereas, Rollin and Mary brought us movies with mammalogists as the heroes, and

Whereas, the gentle, kind and exceptionally beautiful Mary was the mother hen that gave the ultimate touch of class to numerous field trips to Mexico, and

Whereas, we applaud Mary's leadership in the development of the Prairie Edge Museum, and

Whereas, the science of Mammalogy profited immensely by the educational success of Dr. Baker's mentoring and teaching skills with products such as Carl Phillips, Robert L. Packard, J. Keeves Green, Gary Heidt, Gordie Kirkland, Tracy Carter, and Peter Dalby, and

Whereas, Rollin Baker provided excellent leadership to TSM through his presidency, his humor, honorary membership, constant leadership by example and prodding, and a high moral standard in the field, at the desk, and on line with e-mail, and

Whereas, Mary and Rollin get the platinum standard for the universal definition of "Pair bond" with 62 years of love and marriage.

Therefore, be it resolved that the Texas Society of Mammalogists at its 18th Annual Meeting on the 18th -20th of February 2000, at the Texas Tech Campus at Junction recognizes, honors and embraces the accomplishments of Dr. Rollin Baker in leadership, Mammalogy, education, class, the concept of the whole organism, focus on conservation of our beloved Taxon and most of all we honor the lifetime of love and devotion shared by Mary and Rollin Baker.

Minutes of the 18th Annual Business Meeting, 19 February 2000

The meeting was called to order by President Robert E. Martin at 4:20 P.M. President Martin began the meeting with a plea to the membership to make monetary donations in memory of Mary Baker, wife of Rollin H. Baker. The money was to be collected and sent to the Prairie Edge Museum in Eagle Lake, Texas. The museum was founded in part by Rollin and Mary. Donations were collected by Meredith Hamilton during the meeting and Saturday evening's banquet. By the end of the evening Meredith had collected a total of \$873 for the memorial fund in honor of Mary Baker.

Minutes of the 1999 Business Meeting were approved by the members. Secretary-Treasurer Ann Maxwell summarized the Treasurer's Report for 1999 which was published in the 2000 TSM Program. The Society's checking account was maintained at \$1200, with excess funds from the 1999 meeting being added to the certificate of deposit. At meeting time, the CD was worth \$9,415.19. Maxwell recognized Newsletter Editor David Ribble for getting Trinity University to cover the costs of printing and mailing the 1999 Newsletter, which would have exceeded \$400. Between the 1999 contributions to student awards (\$424.00), interest drawn on the CD (\$470.33), and Trinity University's donation of newsletter-associated costs, we were able to add \$1,093.11 to the CD. The Society ended 1999 with total assets of \$10,766.07. Maxwell recognized Meredith Hamilton and Ron Van Den Bussche as new TSM Patron members.

President Martin announced that the Secretary-Treasurer's report had been approved by the Executive Committee during their meeting of the previous evening.

Permanent Secretary Thomas E. Lee reported to the group that he has collected all TSM-associated archives from the previous Secretary, Robert Martin. Lee plans to have those archives deposited in the Abilene Christian University Library and suggested that they should be moved to Texas Tech University when he steps down from his position as Permanent Secretary.

Newsletter Editor David O. Ribble thanked all respondents for their current information which was published in the 2000 newsletter. He also requested that anyone who was not included, but would like to be, please contact him. Ribble reported that the TSM 2000 Newsletter consisted of over 40 pages and was mailed to more than 188 people at a cost to TSM of about \$500. He proposed to make the Annual TSM Newsletter available in PDF format (which can be opened with Acrobat Reader) on a webpage. Everyone would receive materials for registration and call-for-papers through the mail in January 2001. Enclosed with the registration form would be a website address for anyone interested in reading the newsletter. Hard copies would be available for those who make that request to the newsletter editor. Ribble went on to announce that in the coming year he would be out of the country during newsletter-writing time and that he was therefore looking for a volunteer (George Baumgardner) to stand in during that time and fulfill his duties. Baumgardner was agreeable as long as he can get help with the website. President Martin asked if there were any comments or objections to the use of e-mail and a website for future newsletters. There were none.

Chair of the Honorary Members Committee, Tom Lee reported that there were no names submitted for 2000, but that he was ready to take nominations for 2001.

In the absence of Earl Zimmerman, Chair of the Conservation Committee, Terry C. Maxwell reported that there had not been much activity since immediately after the 1999 meeting. He brought up Rollin Baker's concern for the armadillo. It was determined by several members that any decline in the number of armadillos does not appear to be statewide, so the committee has adopted a wait-and-see approach. If it becomes apparent to others that there is a decline, then TSM should consider appropriate action. Maxwell announced that the black-tailed prairie dog has become a candidate species for listing under the Endangered Species Act. He reported a 90% decline in the species and that there was both national and state interest. He then called on Paul Robertson from Texas Parks and Wildlife to brief the membership on the current status of the black-tailed prairie dog.

Robertson reported that, at some time during the previous year, the National Wildlife Federation petitioned the U.S. Fish and Wildlife Service to list the black-tailed prairie dog. The Service ruled that candidacy was warranted but that it was not yet to be listed - it is to be reviewed annually. Also in 1999, an interstate working group was formed with representation by eleven U.S. states. They accomplished memoranda of understanding on prairie dog conservation with Canada and Mexico. The eleven-state group drew up an interstate conservation plan, and each of the eleven states has its own group working on individual conservation management plans as well.

Paul Robertson leads the Texas State Working Group, which had met for the first time just before the 2000 TSM meeting. He said that by the end of 2000 they will have a conservation plan for Texas prairie dogs. It will involve 19 state voter groups. Robertson is expecting good conservation plans from all eleven state working groups. He pointed out that the estimated reduction in this species in historical times is about 98%. Plague has pushed the species over the line. He also reported on a meeting in Phoenix, stating that data shows substantial reductions in the last decade, which has many people worried. Robertson stated that he would be happy to send a copy of the completed (Texas) plan to interested persons upon request.

Terry Maxwell informed the membership about Annika Keeley's (also with TPW) presentation on Friday evening about CARA (Conservation Aid and Reinvestment Act) Funding for nongame species. Once again he invited Paul Robertson to explain the program to the group. Robertson explained that funds of about \$37 million per year for Texas will be available as a consequence of taxes on offshore oil production. About \$10 million of the \$37 million will be available for nongame programs. Robertson urged TSM members to contact state representatives in support of this bill, stating that it could mean substantial research funding available for members of this group, including graduate students.

Chair of the Committee on Student Honoraria Robert C. Dowler did not give a report on student awards until after the annual banquet. Recipients of the awards were announced by Dowler as follows: Kelly E. Allen, Texas Cooperative Fish and Wildlife Research Unit, Texas Tech University received the William B. Davis Award (\$100) for her paper entitled, "Mapping the mammals of Texas". The TSM Award (\$100) went to Steven R. Hooper, Department of Zoology, Oklahoma State University for his paper entitled, "Phylogenetic relationships of plecotine bats and allies: independent assessment based on mitochondrial ribosomal sequences." Recipient of the Robert L. Packard Award (\$150) was Cody W. Edwards, Department of Biological Sciences, Texas Tech University for his paper entitled, "Biogeography, cryptic species, and paraphyly: molecular phylogenetics of the genus *Neotoma*."

The report of the Resolutions Committee was supposed to be presented by Hershel Garner, who was not present at the meeting. Robert Baker was asked to stand in for Garner. The TSM 2000 Resolutions were presented at the banquet on Saturday evening. They can be reviewed in the 2001 TSM Newsletter.

The report of the Nominations Committee was presented by Robert Baker. The committee was comprised of six members of the Executive Committee, who met on the previous evening. Phil Sudman was the only nominee for President-Elect by the Nominations Committee. No nominations were made from the floor. President Martin moved that Phil Sudman's nomination be accepted by acclamation. The motion passed without dissent. Secretary-Treasurer incumbent, Ann Maxwell was reelected by acclamation.

Terry Maxwell moved, and Robert Dowler seconded, that the 2001 meeting of TSM be held in Junction, Texas at the Texas Tech University Center. The motion passed by unanimous vote.

During the meeting, a passing of the hat garnered \$860 for the Prairie Edge Museum in honor of Mary Baker.

President Robert Martin thanked Ann Maxwell for her job in aiding with organization of the 2000 meeting. Robert Dowler was thanked for chairing the Student Award Election Committee.

The 2000 TSM Business Meeting concluded at approximately 5:30 pm.

COMMENTS and ARTICLES by ROLLIN H. BAKER

Old Thom Sez

OLD THOM sez: How did we get so many good mammalogists around? Maybe it was because they were under the care for post-teenagers who knew practically nothing about child-rearing - their parents. In short, they survived and studied mammalogy in spite of this loving and doting but often incompetent post-natal treatment. It surely makes one wonder if many of the natural extinctions among non-human mammals were actually the result of inept parental guidance?

Old Thom sez: A good mammalogist is one who has the skill necessary to be competent but also to recognize competence in others.

Old Thom sez: With all of these complicated interspecific mammalian interactions, it's a wonder that some species don't slip through the cracks and get lost in the shuffle. Perhaps some did before nosey mammalogists appeared on the scene. On the other hand, a species might just get "lucky" enough to evade being merely converted into "energy" and moved from one trophic level to another. If this occurs, this "escapee" might end up by "gleefully" multiplying out-of-control and upsetting its local community's biotic balance. Such an occurrence could be what happens when Texas populations of the hispid cotton rat (*Sigmodon hispidus*) seem to "explode" about every 40 years (see Allen, *Bulletin, American Museum of Natural History*, 8:62-64, 1896; Bailey, *North American Fauna No. 25*:116-17, 1905; Strecker, *Journal of Mammalogy*, 10:216-200, 1929; Haines, *Ecology*, 44:771-772, 1963).

Old Thom sez: Early in a career, a mammalogist needs to pay attention to the species since that is from where scads of papers can be ejected - helpful in forwarding one's career, getting one's name before colleagues, and pleasing deans by scoring high in "publish-or-perish" tournaments. But after while and after one gets oodles of details defined, one should begin to look philosophically at one's findings -perhaps in relation to their generic, familial, and ordinal connections or to their places in biotic communities. And that often becomes the "good" stuff for which one will be remembered,

Old Thom sez: Never forget the Mammalogist's Oath. For those of you who may have forgotten, it is **"If a mammalian study is not designed to gain publishable data, it ain't worth doing!"**

ARE TEXAS FURBEARERS BETTER OFF THESE DAYS?

There was a time when pelts of fur bearing mammals were cash crops for many a Texas farm lad. In the 1930s, for example, the sharecropper's son made a few extra bucks to help keep the family in grub during the short-on-cash winter months. This was also when work in fields of cotton and corn slowed and a few Victor leg-hold traps hanging in the barn could be set out in strategic places such as down along the creek. The catch, mostly Virginia opossum, raccoon, striped skunk and maybe one highly prized mink, was carefully skinned and stretched.

The young outdoorsman vied with others in contests for the best-stretched pelts judged each year by Sears Roebuck. The schoolboy also learned, often the hard way, how to dicker with city-slicker fur buyers for top dollar. Some of these youngsters got their start as businessmen or even as wildlife biologists from this rural-oriented profession.

And fur products, in those days, adorned milady's treasured wardrobe to be worn on special occasions with pride. It was in 1940 that I, skimping on a few necessities, bought my dear wife a full-length muskrat coat from the *Alaskan Fur Company*, then a leading Houston store in this lucrative business. She sure looked pretty wearing it!

As a budding wildlife biologist, I was enamoured of furbearers and studied them whenever possible. For example, I joined farm boys using terriers in rousting mink out of their prairie pond-side burrows; shivered on many a cold night following hounds and their handlers trailing raccoons; interviewed buyers about the economics of the business and dozens of licensed trappers about their catches; helped Dan Lay live trap opossums and count muskrat beds; waded behind old-time trappers running river-bottom trap lines; walked stream banks galore counting animal tracks; helped restore beavers in East Texas; gathered data on furbearer movements, food habits, parasites; and even published about the animals.

The pre-WWII heyday for Texas fur trapping slowly began to hit the skids by the 1950s. Quality controlled pelts obtained by production line methods from highly bred, pen-raised fox and mink, a flood of imported Asiatic fur, and low prices for pelts of locally-caught animals helped put Farmer Brown's Boy out of the business. The price of Texas bobcat fur held up well for a time, but in most years stretched Texas pelts brought little more money than they did prior to the war, even though prices for most other commodities jumped in value five or more times. The financial incentive for the average rural teenage trappers was lost.

Then American coat styles (but not necessarily those in Europe) changed and be-kind-to-animal groups complained effectively about the torment that trapped fur animals must endure. Artificial furs became acceptable substitutes. Ladies began to feel self-conscious when wearing apparel even modestly trimmed with fur. In Dallas, for example, few stylish ladies wrapped in full-length mink are seen these days shopping in Neimans or dining in fashionable restaurants. Such gorgeous fur coats and wraps now hang mostly in storage with little turnover. Many a money-strapped suitor or harried husband is glad of it, but out-of-work furriers are glum as they seek other employment.

In short, with trapping pressure reduced or even non-existent in many sectors because of the above reasons, how are our formerly "heavily" persecuted populations of Virginia opossums, beaver, muskrat, raccoon, ringtails, mink, bobcats, etc., thriving? Do we see more road-killed Virginia opossums and raccoons now than 60 years ago? Have populations of furbearers, with pelt harvest at a minimum, increased excessively and perhaps become more mischievous - at least when it comes to meddling in human affairs? What's ahead for them as a wildlife resource in a political sense?

WANTED: MORE HANDS-ON TEXAS MAMMALOGISTS

Of course we need to inventory an area's mammals before we can study why and how they live there. In our hemisphere east of Panama the needed inventory has had a meritorious start but has a long way to go. In fact, we could use a generation or two of field-savvy Neotropical mammalogists carrying on like super E. W. Nelsons and E. A. Goldmans egged on by C. H. Merriams to ferret out the mammals from every nook and cranny, and then get area O. Thomases, W. H. Osgoods, A. Cabrerias, Phil Hershkovitzes, and Syd Andersons to classify them and define their distributions.

However, in our hemisphere west of Colombia, reconnaissance mammalogists have nearly completed this task. Sure we need to pinpoint more precisely some species distributions, like those of south-of-the-border shrews. To get where we are, however, forty or more years ago many of our field-oriented mammalogists concentrated on basic distributional studies. And reports of such investigations usually held center stage during meeting programs or were lead articles published in our journals.

I recall a 1940 meeting of the ASM, where the entire audience, including myself, listened with great interest while Seth Benson discussed his mammal collections obtained from an isolated Nevada mountain range. Nowadays, however, reports summarizing collecting efforts more likely appear in poster sessions at meetings and be more acceptable for publication in local/regional publications.

But don't get me wrong! Projects designed to annotate mammalian distributions should be encouraged and, if worthy, should be placed in our printed record. Why? Because these reports have scientific value! If you don't believe me, just ask anyone who compiles data for species monographs or for state/regional treatises. Such authors combine these note-type articles and come up with a wealth of minute natural history data.

However, once the "cream" is skimmed off, meaning that the novelties have been described and the species distributions untangled, it becomes time to sober up and begin to plod through the intensive phase of this on-location business. Details must be gleaned about each mammal's private life - its breeding biology, resource needs, interspecific interactions, density, behavior, limiting factors, economic importance, other environmental relationships, etc.

Such intensive investigations can be exciting and revealing but take time, patience, hard work, and long exposure to the vagaries of the environments in, for example, a sweaty cloud forest or a skin-parching desert. And these assignments require much more money than do funding itinerant mouse-trappers. Besides needing pricey semi-permanent field headquarters, please ponder the expenses of buying all of the new-fangled remote sensing devices and other gadgets that might be applied to help one better understand mammalian ways in the wild.

Consider studying poorly-known mammals that live close to the mammalogist's home base first and afterwards work on those in more remote and "romantic?" locales. For the latter, bases of operations may be available since numerous institutions have or are now establishing field research stations in various of our hemispheric environments - e.g., Welder Wildlife Foundation, Charnela-Cuixmala Biosphere Reserve, Estacion Biologia La Selva, or Barro Colorado. Anyhow, this compelling challenge to find answers to questions about the life of each and every mammal will continue to entice us.

Consequently, we need to train more inquisitive, energetic, observant, ingenious, persevering, and field-oriented "hands-on" mammalogists to conduct these important missions. And our modem courses ought to be emphasizing more field methodology including a re-introduction of that basic "how-to-do-it" need - the preparation of mammals as museum-type voucher specimens.

ARE TEXAS MAMMALS UNDERGOING HOMOGENIZATION?

My old-time mentor and Texas Cooperative Wildlife Research Unit boss Walter P. Taylor must truly be rotating in his grave if he is aware of the post WW-II frenzy of exotic mammalian imports [= biotic homogenization] into his (and our) fair state. He, of course, is not condemning the influx of humans (*Homo sapiens*) from every which way. Rather it is the entry of assorted "under" classmates running free in our environments and competing with (and helping trash) our very spectacular mammalian faunas and their biotic associates.

Walter P., bless his heart, impressed his students with abundant reasons why it is folly to make like Mother Nature and introduce aliens into our several eons-old, naturally-selected, and "biotically-balanced" outdoor communities. Happily he would report, in his lectures in the late 1930s, that most introductions, like breeder-popular chukar (*Alectoris chukar*), didn't take. However, he added unhappily that some did, like house mouse (*Mus musculus*) that tagged along passively as a human "camp follower" and aoudad (*Ammotragus lervia*) that was introduced on purpose. About the latter he would go on to deplore the negative, but largely undocumented ecological influence, of this domineering bovid on the delicate biota of Panhandle badlands.

Have subsequent generations of Aggie wildlife biologists and others been indoctrinated with Walter P.'s stem warnings about the evils of introductions? Probably they have been but for one reason or another either (a) oblivious to this menace and allowed this freewheeling and highly unwise ecological nonsense to propagate or (b) basically opposed the practice but neither spoke out loudly against nor raised noticeable sand about such goings-on.

Maybe this report is poorly timed since the barn door has long been left open for alien critters to escape into our midst - infesting our delicious landscape with exotics. If we concern ourselves herein only with post WW-II mammalian imports, the plague of nutria (*Myocaster coypus*) first comes to mind. All we need to view is this intruder's damage to Colorado Country's Eagle Lake. Lacking environmental restraints (even hungry alligators didn't help), this vegetarian in the 1950s converted our expansive oxbow filled with dazzling wind-baffling islets of southern wildrice = sawgrass (*Zizaniopsis miliacea*) and other emergents that kept the shallow water placid and crystal-clear and provided nesting sites galore for herons, egrets, etc., into a breeze-churned and open mud hole. Nuff said!

I suppose the term "sensational" should be used to describe the variety of exotic cervid/bovid types established in Texas habitats since Walter P.'s time (see W. B. Davis and D. J. Schmidly, *The Mammals of Texas*, 1994) These authors list such free-ranging cervids as fallow deer (*Dama dama*), axis deer (*Axis axis*), Sika deer (*Cervus nippon*) and such bovids as nilgai (*Boselaphus tragocamelus*), blackbuck (*Antelope cervicapra*) plus the earlier-released aoudad (*Ammotragus lervia*). In addition,, take time to scan the assortment of ungulates roaming "confined" spaces as reported by M. S. Traweek (*Project No. 21: Statewide Census of Exotic Big Game Animals*, Federal Aid Project No. W-127-R-3, Texas Parks & Wildlife Department, 1995). And don't forget to add to this impressive list the "fenced" colony of Japanese macaque (*Macaca fuscata*) in the Dilley area and a plethora of non-native felids, canids, and other critters kept as "pets" in private hands. Like escaped monk parrots (*Myiopsitta monachus*) now establishing residence, can we anticipate more "sudden" mammalian invasions of our environmental privacy to occur?

Just about the time that Texans have become resigned to having their mammalian habitats cluttered with European-derived domestic livestock (equids, suids, and bovids), along comes this post-war wave of "wild" cervids and bovids to enhance the problem of our gaining an understanding as to how our native mammals withstand all this competition for environmental resources. We might as well resign to the fact that we can't rid ourselves of the exotics that have already encroached, but can we slow and prevent others from doing so?

THE NEOTROPICAL CONNECTION

On my return from being involved in the great conflict in 1946, I stopped to visit my old Cytology/Embryology Professor J. T. Patterson who immediately told me about Frank Blair, the outstanding young mammalogist whom he had just hired. J. T. was surprised when I spouted off about some of Frank's sterling attributes. I explained to J. T., of course, that field mammalogists are a rather chummy and nose-y group.

Anyhow, Frank wrote some excellent reports about distributional patterns of Texas mammals, following somewhat the format established by his long-time mentor, Lee Raymond Dice. I suggest that you review Frank's papers from time to time; they contain stimulating fare. He could have done more good work on "higher" mammals if only he had not been sidetracked by the charms of "ancestral" mammalian types - fence lizards, toads, etc.

Some of Frank's notions have stimulated my thinking about how two geological events injected "new life" into the diversity of the Texas mammalian fauna. I refer here to intercontinental exchanges brought about by the establishment of two land bridges. A late Tertiary one in the Panamian Isthmus, provided Torrid Zone mammals with a rather narrow and continuing (at least until about 1914) pathway between what is now southern North and northern South America. The other, a Quaternary one in the Bering Strait area, provided Frigid Zone mammals with a rather broad and highly temporary Ice Age pathway between what is now northeastern Asia and northwestern North America.

These accesses allowed at least some "curious and adventuresome" immigrants to somehow or other successfully run the gauntlet imposed by an "unfriendly" and thoroughly well-entrenched local mammalian establishment. By this means these aliens ultimately augmented and diversified today's crop of terrestrial Texas mammals. These invaders accomplished this even though the bridges that they used were geographically remote from Texas - as the crow (or preferably a bat) flies, approximately 3,250 km northwestward from the former and 5,500 km southeastward from the latter.

Looking just at suspected happenings in what is now South America, its neotropical mammals had prior to the appearance of this land bridge "enjoyed" a degree of isolation. Perhaps this sanctity was disrupted a time or two, chiefly by the successful entry of island-hoppers and/or rafters. Even so, this standoffish arrangement allowed for these isolates to practice their own special kinds of adaptive radiation, using as breeding stock therian roots from North America and metatherian roots presumably from Australia.

However, once this rather skinny, ecologically-undiversified, and tropical pathway became available, it must have triggered a truly "bloody" and competitive north-south ordeal between interdigitating invaders and defenders. It now appears that, based on the modern scene at least, northern-based infiltrators - soricids, leporids, myomorph rodents, canids, ursids, procyonids, mustelids, felids, ungulates - were more successful going southward than were southern-based ones - marsupials, xenarthrans, platyrrhine primates, hystricognathian rodents, ungulates - going northward.

Perhaps this lopsided exchange shortchanged the number of neotropicals venturing northward as far as Texas. Although ground sloths, glyptodonts, and capybaras made earlier but ill-fated intrusions, Texas now hosts only a mere three of these southerners - Virginia opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), porcupine (*Erethizon dorsatum*).

However, had South American species that were adapted to less tropical parts of Neotropica been able to survive the rigors of this torrid Isthmus crossing, we might now be swamped with creatures perhaps as unwelcome as the highly-destructive, human-introduced, and temperate-adjusted nutria (*Myocastor coypus*). Heaven forbid! Even if they were now able to do so, the construction of the Panama Canal has once again "isolated" the two continents to all poor-swimming mammals.

Postscript: Several years ago while having lunch with the Panamanian Ambassador, your scribe naturally offered him and his colleagues every success once they assumed administration of the Panama Canal. In addition, your scribe got up enough courage to suggest that a broad bridge should be built across it and covered with representative local habitat - substrate on up. Why? So that native flora and fauna on each side might have the normal intercourse that

they experienced in pre-canal times! The ambassador smiled diplomatically and said that he understood the importance of such an environmental continuity but made no promise to promote such a venture.

TEXAS MAMMALS ON THE EDGE

Mammals reproduce geometrically, and their tendency, as they thrive, is for their bumper populations to push outwardly in search of new living spaces. These expansions are ultimately arrested when degrees of environmental tolerance that species have selectively inherited approach a critical minimum or maximum. Since each mammal has its own special inherited range of environmental tolerances, some are more widely distributed than others - much to the delight of inquisitive mammalogists.

Texas' uneven hodge-podge of distinctive habitats actually confines the "natural" living space of most resident mammals to a patchwork of favorable habitats interspersed with unfavorable ones. This kind of arrangement, worsening as human land-use practices further fragment the landscape, must seriously influence survival, especially of less tolerant mammals.

However, it must be at the actual edges of "natural" ranges that survival-certainty is most haphazard. There, the welfare of each species depends on its environmental tolerance levels to maintain sufficient width so that at least a residual border population survives. Such is probably the case for the terminating distributions in boreal Canada and tropical South America of wide-ranging Texas species such as eastern cottontail (*Sylvilagus floridanus*), gray fox (*Urocyon cinereoargenteus*), mountain lion (*Felis concolor*), and white-tailed deer (*Odocoileus virginianus*). Survival of these species is more likely assured in their mid-range Texas localities where fewer pesky and fickle limiting factors reach critical status.

Nevertheless, many other mammals are faced with similar borderline predicaments in Texas since sectors of their "natural" ranges suddenly zero out here, especially where the habitats of the state's vast open prairies, plains, and deserts intergrade. Representative species from three directions approach and often associate while facing this fadeout dilemma: (a) those intruding eastward from and western locales such as desert shrew (*Notiosorex crawfordi*), desert cottontail (*Sylvilagus audubonii*), Ord's kangaroo rat (*Dipodomys ordii*), and badger (*Taxidea taxus*); (b) those intruding westward from eastern locales such as least shrew (*Cryptotis parva*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), fulvous harvest mouse (*Reithrodontomys fulvescens*); and eastern spotted skunk (*Spilogale putorius*); (c) those intruding northward from coastal prairie such as eastern harvest mouse (*Reithrodontomys humilis*), marsh rice rat (*Oryzomys palustris*), northern pygmy mouse (*Baiomys taylori*), and common hog-nosed skunk (*Conepatus mesoleucos*); and (d) those intruding southward from the Great Plains such as plains pocket mouse (*Perognathus flavescens*), plains harvest mouse (*Reithrodontomys montanus*), and prairie vole (*Microtus ochrogaster*).

What specific kinds of environmental factors are involved in triggering the fadeouts of each kind of mammal - changes in climate, edaphic factors, biotic associates?

Are individual mammals living in these edge situations "abnormally" stressed while experiencing rather poor odds as to their survival certainty under less-than-ideal situations?

Have human-promoted actions produced Texas environments that have narrowed the range of inherited habitat tolerances for such space-losers as black-tailed jackrabbit (*Lepus californicus*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), gray squirrel (*Sciurus carolinensis*), eastern spotted skunk (*Spilogale putorius*), and mountain sheep (*Ovis canadensis*) or, instead, widened the range of inherited habitat tolerances for such space-gainers as nine-banded armadillo (*Dasypus novemcinctus*), northern pygmy mouse (*Baiomys taylori*), hispid cotton rat (*Sigmodon hispidus*), prairie vole (*Microtus ochrogaster*), and common porcupine (*Erethizon dorsatum*)?

TEXAS MAMMAL/MAMMALOGIST VIGNETTES

VIRGINIA OPOSSUM (*Didelphis virginianus*) - Our basic understanding of the fascinating reproductive biology of this metatherian was unraveled by Texan C. G. Hartman in an Austin laboratory in the early 1920s.

EASTERN MOLE (*Scalopus aquaticus*) - While this specialized insectivore is widespread in eastern and northern Texas, in Trans-Pecos Texas there is only a single specimen known - from Presidio County. Another is known from across the Rio Grande in the Sierra del Carmen of Coahuila. Expert mole-catchers need to get busy and obtain a few more records to determine how this fossorial insectivore survives in those often dry desert or montane soils.

MEXICAN LONG-NOSED BAT (*Leptonycteris nivalis*) - The discovery of a colony of this pollen/nectar-feeding bat plus the presence of other interesting animals and plants and impressive scenic vistas in the Chisos Mountain area provided major inducements in the 1930s for the later establishment of the Big Bend National Park.

NINE-BANDED ARMADILLO (*Dasypus novemcinctus*) - Texan H. H. Newman made the initial discovery in the 1910s that polyembryony occurs in this straggler north from Neotropica. While females of this species give birth to identical quadruplets, at least one South American relative produces litters containing even more - identical octuplets.

HISPID COTTON RAT (*Sigmodon hispidus*) - Vernon Bailey (*Biol. Survey of Texas*, N.A.F. No. 25, 1905), J. K. Strecker (*Jour. Mamm.*, 10:216-220, 1929), and H. Haines (*Ecology*, 44:771-772, 1963) published reports that spectacular irruptions of Texas populations of this rodent have occurred about every 35-40 years since the 1850s. Shall we predict now that another such event will occur prior to 2010? If so, should we be watchful for some kind of advance notice that could assist us in explaining why these irregular reproductive happenings occur?

PRAIRIE VOLE (*Microtus ochrogaster*) - At the turn of the century Ned Hollister's caught the first modern record of the prairie vole at the edge of a prairie near Sour Lake in Hardin County. For decades thereafter, field mammalogists probed in vain to find more state records until recently when "suddenly" the Great Plains branch of the prairie vole assemblage appeared in Texas counties joining Oklahoma's Panhandle. Is the prairie vole outcompeting the domineering graminivore, the hispid cotton rat, for a share of the North Texas living space?

MARGAY (*Felis wiedii*) - The margay persists as a modern member of the Texas mammalian fauna because of a specimen from Eagle Pass obtained in the 1850s. Riparian growth along the Rio Grande could have provided an avenue for upstream dispersal by an adventuresome felid from and tropical brush lands in Tamaulipan lowlands. Nevertheless, to many skeptics, Eagle Pass may not have been the actual place of capture. Should we delete it from the state list?

JAGUAR (*Panthera onca*) - Houston naturalist H. P. Attwater (died 1930) gained the attention and respect of the array of mammalogists and ornithologists concentrated in Washington at and near the turn of the century. He must have thoroughly enjoyed this association and took pains to collect assorted birds and mammals for their study and was at least modestly pleased when these authorities described species new to science with some named in his honor. This was at least the impression your scribe obtained when he and wife Mary Baker interviewed Attwater's widow at her home on Genessee Street in Houston in 1940. Railroader Attwater had a pass on the Southern Pacific that facilitated his reaching interesting collecting areas. Perhaps his most famous escapade culminated in his acquisition of the famed Goldthwaite jaguar in 1904 for the Smithsonian. This unfortunate creature, a mature male, had apparently become "lost" and drifted excessively northward from perhaps its normal residence in the Rio Grande Valley. It was finally dispatched near Center City in Mills County. Attwater negotiated for the skin and skull, finally going to Goldthwaite himself to persuade the locally-acclaimed hunters to part with it.

WHY DO POCKET GOPHERS LIKE TEXAS?

Taxonomists have had a long-time love affair with pocket gophers. Why? Because these fossorial mammals possess variable, "made-in-heaven" physical/behavioral characteristics helpful in promoting species/subspecies genetic diversity. These features include restricted home ranges, social incompatibility except when breeding, minimum dispersal to select mates, cranial configurations differing between sexes, pelage hues often resembling those of surrounding soils, and size often correlated with substrate friability.

Vernon "Gopher Bill" Bailey and C. H. Merriam started the boom in classifying Texas pocket gophers in the 1890s. W. B. Davis and E. A. Goldman re-ignited this conflagration in the 1930s but today taxonomic findings - especially at the subspecific level - accumulated in this glamorous classificational epoch are met today with less of a blaze.

In fact, few mammalogists save for dyed-in-the-wool classifiers can truly appreciate the "cluttered" zip-a-toned maps showing geographic ranges of literally hundreds of named subspecies of pocket gophers in Hall (*The Mammals of North America*, 1981). Nevertheless, workers interested in pocket gopher behavior, ecology, genetics, biochemistry, physiology, etc., need taxonomists around in order to help them hang proper Latin names on the subjects of their investigations.

According to the current taxonomic literature, Texas houses 8 resident species - 6 polytypic: *Thomomys bottae*, *Geomys arenarius*, *G. breviceps*, *G. bursarius*, *G. personatus*, *Cratogeomys castanops*; and 2 monotypic: *Geomys attwateri*, *G. knoxjonesi*. This is a rather significant taxonomic showing with the species count exceeding the number found in other states.

Why so many Texas taxa? Does the terrain and its properties have some yet-to-be-recognized peculiarities promoting speciation? Have we had more splitters than lumpers involved here than elsewhere? Have we divorced ourselves from the gross morphological arena too much and perhaps leaned over backwards a bit far in looking at small biological features?

In our mind's eye, let's motor from Waco in McLennan County to Houston in Harris County, more or less in the Brazos River Corridor. With traffic like it is these days, we decide to take a slightly less than direct route and drive southward on highway US-77 to highway I-10 and then eastward to our destination. We traverse what was in pre-settlement time superb prairie-chicken country.

Along the way we note few major topographic changes. We watch as the elevated rolling country of the Waco area gently levels off as we reach the coastal peneplain. Likewise, we observe no insurmountable streambeds to block gene flow of most small resident mammals doing their best to survive in all habitats for which they are adapted. Of course obscure soil changes could influence the distribution of finicky pocket gophers.

Also we see few major natural biotic changes along this travel route, even though primeval plant/animal features have been obliterated in many sectors by intensive human occupation. With humans have come the exclusion of uncontrolled fires, the encroachment of woody vegetation on traditional grass/forb domains, the introductions of assorted exotics and chemical additives, the extirpation of flora and fauna galore, the gross disturbances of prairie sods, the excessive silting of water ways, etc.

But the century and a half since the beginning of this intensive human occupation has perhaps been far too short a time for forces, like those listed above, to induce pronounced naturally- selective genetic changes in pocket gophers. It is also possible, of course, that many above-surface environmental stresses and changes effecting selective processes of, for example, a fulvous harvest mice might have little influence on a rather "unconcerned," hermit-like, and underground-dwelling rodent like a pocket gopher.

Yet, in route we pass through country inhabited by three distinct species of pocket gophers of the genus *Geomys*: first *G. bursarius*, second *G. attwateri*, and third *G. breviceps*. According to current literature their

geographical ranges strangely do not overlap. Also these three fossorial lookalikes are mostly distinguished by karyotypic differences.

Careful workers have described these species and authenticated their distributions. However, curious colleagues may need reassurance as to how and why three closely allied but seemingly segregation-prone pocket gophers have staked sole claims to parts of a rather homogenous piece of real estate. Colleagues might also conclude that the saga about the diversity of Texas pocket gophers lacks an unfinished chapter or two.

TEXAS MAMMALS ENDURE TWO HUMAN INVASIONS

Harken back in your mind's eye to a Texas landscape several thousands of years ago. Let us also suppose that at that time most, if not all, of the Ice Age megafauna had gone its way and boreal-type mammals (possibly woodchucks, southern bog lemmings, etc.) had followed the melting-back continental glaciation poleward. In short, one could suspect that the assemblage of resident mammals was much like it is today.

The biota in what is now Texas consisted of a neat series of age-old and more-or-less stabilized communities. The producers, consumers, and decomposers were in place and involved in maintaining a degree of biotic balance. The fittest were surviving as they truly should. And being somewhat biased and myopic on the subject, your scribe would suspect that the union "leadership," if any, was in the paws and claws of the mammals. Well and good!

Then intruding suddenly into these home-spun vital mixtures were two invasions by an Old World mammal, the human being (*Homo sapiens*). These encroachings came in two waves - an early one - more than 25,000 years ago - from the West and a much later one from the East - less than 500 years ago.

The ancestors of the comers from the West left their Asiatic homes several millennia earlier to cross the then existing Bering Land Bridge (Beringia) to invade what is now the Americas, previously unmolested by this species. These people flourished and spread out, reaching what is now coastal Texas more than 8,000 years ago - at least a habitation near the present city of Victoria was dated in that time frame.

During their long residency in Texas, most of these people retained the hunting-and-gathering ways of their ancestors with only a few delving into agriculture. They neither saturated the countryside with their progeny nor apparently severely exploited, except perhaps near their habitations, the resident wildlife. In short, we can conclude that this human intrusion from the West maintained a non-depleting co-existence with the native Texas mammals.

The second human intrusion from the East began in the Sixteenth Century but not extensively in Texas until the early years of the Nineteenth. These people came equipped with Old World cultural enhancements firearms, metal implements, domesticated cereals, fruits, vegetables, and livestock plus such noxious camp followers as small pox, weeds, insect pests, commensal rodents, carp, and roaches.

In 1800, for example, most ages-old, smoothly-operating "survival of the fittest" biotic communities were extant. Within several decades, however, these natural relationships were trashed severely in one way or another by the people from the East. These intruders came to expel the earlier people, to divvy up their lands for intensive agribusiness purposes, to establish permanent settlements, to saturate the real estate with their progeny, and to extract from the land every possible personally-useable or sellable natural resource.

The biotic battering and the substrate grab have continued unabated although to a lesser extent after the 1930s. By the time of that decade enforceable rules and regulations were being promulgated to govern uses and control abuses of the Texas countryside and its then fragmented environmental natural resources.

Naturally the descendants of these settlers are proud that their forebears came, labored long and hard in the wilderness, and "tamed" the land to make it fit for those who followed to have the "good life." But what about the native flora and fauna that got in their way?

Texas mammals and their biotic associates responded in different ways to these intensive land-use practices. A few like the gray and red wolves, black-footed ferret, bison, and mountain sheep lacked the ability to adapt and were either extirpated or nearly so.

The response to habitat changes by most extant native mammals is difficult to appraise. Populations of some like the black-tailed prairie dog and kit fox appear threatened. Populations of still others like the beaver, black bear, pronghorn, and mountain sheep, all formerly seriously threatened, are now enhanced by introductions and appropriate protection. Populations of some mammals like the Virginia opossum, Brazilian freetail bat, eastern cottontail, fox squirrel, and white-tailed deer have responded highly favorably to these habitat changes.

We have a fair notion of the status of the Texas mammalian assemblage in 1800, and where their surviving descendants that have weathered these habitat disruptions occur today. Mammalogists, at least, are in luck in this regard. Students of many kinds of plants, some lower vertebrates and most invertebrates, on the other hand, have virtually no idea what the array of life in their categories was like in pre-settlement times. It has been a tough 200 years for Texas mammals - and other wildlife.

MAMMALS IN TEXAS BIOTIC COMMUNITIES

Texas, an immense political unit (>693,000 km²), has impressive climatic credentials with an annual average N-S temperature ranging from 13° at Dalhart to 23° at Brownsville and an annual average E-W rainfall ranging from 21 cm at El Paso to 139 cm at Orange. These environmental factors along with edaphic ones stimulate the growth of temperate grasslands in the north and subtropical thorn-shrub in the Rio Grande Valley and deciduous/coniferous forests in the east and deserts in Trans-Pecos (Cameron et al., *Texas Jour. Sci.*, 49(3):155-180, 1997).

The impressive mammalian species mix in these diverse Texas habitats has attracted devotees, since the time of Vernon Bailey, to suggest ways to pigeon-hole members of this group of creatures into assorted distributional patterns (see, for example, Owen, *Ecology*, 71(5):1823-1832, 1990). These patterns continue to be an interesting challenge.

What attracts mammals to live in biotic communities? The underlying reasons may be highly complicated, but on the surface at least, food diversity seems to play an important role. For example, habitats in Colorado County are situated at the junction between low and high parts of the central Gulf Coastal Lowlands in an ecological area termed the Post Oak Savannah that features both oak/hickory woodlands and prairie environments.

The woodland is strictly rodent-poor with the fox squirrel, whitefooted mouse, and eastern woodrat as residents. The gray squirrel, highly restricted to county riparian woodlands, is now scarce and not included herein. The open prairie lacks the arboreal adaptees, but supports such native rodents as the thirteen-lined ground squirrel, Attwater's pocket gopher, hispid pocket mouse, marsh rice rat, fulvous harvest mouse, white-footed mouse, northern pygmy mouse, and hispid cotton rat. Why the difference? Perhaps the assorted open-land vegetation generates more kinds of edibles that several granivores and two graminivores can comfortably share. In the meantime an observer may wonder how three woodland rodents manage to survive year-around, especially in times of mast shortages.

The rodent species load on this grassy coastal prairie, however, takes second place when compared with the assortment of sciurids, geomyids, heteromyids, and murids in this highly dissected desert/grassland terrain in the Trans-Pecos. Owen (*Ecology*, 69(4):1161-1165, 1988) logically suspects that habitat heterogeneity in the Trans-Pecos contributes to this spectacular rodent population. In essence, these western habitats house a plethora of seed-producing plants in order to satisfy the nutrient requirements of a dozen or so hungry granivores that make up most of this aggregation.

Mammalian assemblages residing in biotic communities play major resource-using roles as primary and secondary consumers and scavengers in terrestrial, fossorial, and/or arboreal situations. At the same time they may accommodate other animal residents by, for example, sharing their nests, burrows, food caches, and other habitat modifications or even harboring parts of their life cycles if the organisms happen to be parasites. As plant benefactors,

mammals may encourage vegetative survival/dispersal by means of their random fecal discharges of undigested and still viable seeds.

Texas mammals vary in their "likes and dislikes" of the attributes of different communities. Some like the golden mouse, kit fox, and pronghorn thrive best in the narrow confines of a few communities while others like the more-ubiquitous white-footed mouse, coyote, and white-tailed deer successfully occupy an assortment.

However, identifying mammals residing in biotic communities adds little input about their relationships to other participants in these fragile and pulsating congresses. Without having complete plant/animal inventories, Texans will neither appreciate the positions of the mammals fully nor determine which of the multitude of the plant/animal residents are the most vital in preserving these communities.

Perhaps someday we will field a team of assorted specialists in order to identify all life forms residing on a piece of Texas real estate and how these organisms interact. In short, dismiss the "Air Force" approach filled with remote speculations and send in the "Infantry" to do the necessary on location spadework. The findings, one could predict, would be surprising and utterly fantastic. Meantime, we applaud the pioneering workers and eagerly await the outcome of their try for a complete inventory now underway in the Great Smoky Mountains National Park.

MAMMAL HELMINTH ARRANGEMENTS

Of course we know most about parasites that infest and cause discomfort to the human species. However, other mammals have these same problems, many of which nose-y mammalogists have failed to inspect fully. Least known are probably those parasites in which arthropods are the vectors. When these carriers are involved, naturally we think of such bad infectious actors as parasitic protozoans, viruses, and bacteria.

We then suddenly remember that heart problems in dogs may be caused by nematodes carried by mosquitoes. When the vectors are active, veterinarians advise us to keep our pets on parasitocidal agents. How do wild canids, lacking Fido's creature comforts, react if they become infected? Was this nematode endemic in wild New World canids or was it brought here by Old World derived domestic dogs? More questions come to mind

In the past, parasitologists have mostly depended on field collectors to preserve from captured mammals obvious fleas, lice, ticks, mites, cuterebrid botfly larvae, trematodes, cestodes, nematodes, acanthocephalans, etc. I got into the act of collecting fascinating helminths, in East Texas beginning in 1938 initially for Rice University's late and great parasitologist Asa Chandler. My ego naturally soared when Chandler mentioned my cooperation in papers that he authored about helminths of armadillos, guinea worms in raccoons, and especially when he named an undescribed gray squirrel tapeworm, *Raillietina (Raillietina) bakeri*.

After gaining professional and in-depth experience in investigating vertebrate host/parasite relationships to the welfare of Pacific troop concentrations in WWII, I tried in the post war years to lure parasitologists to join my summer field parties first out of KU and later MSU. I succeeded only twice - one from Nebraska went with me to Wyoming in 1951 and one from Oregon State to Mexico in 1975. These microbiologists were treated royally by having only limited camp and field duties. They were seated in comfortable director's chairs, situated in shady, insect-net draped quarters, allowed to examine thoroughly outer and inner parts of every mammal obtained, and provided with the scientific names, ages and sexes of the hosts, places and dates of capture, and other pertinent data. Other party members, on each occasion, were simply amazed as well as educated about the kinds and numbers of parasites obtained.

The helminth load of many mammals, to repeat, may be truly remarkable - try examining, for example, the aggregation in the lumen of the intestinal tract of a seemingly healthy porcupine. The first question a curious person might ask is how does a mammalian host manage to survive with a plethora of these trough-feeding uninvited guests? Maybe these helminths are not as damaging to their hosts as popularly thought. After all, a successful parasite needs a "healthy?" living host - not a dead or dwindling one - in order to complete its mission. Yet, severe cases of meningeal worms in cervids or of sinus worms in mustelids don't win the parasites any goody points with most mammalogists.

We know that in the case of some helminths, notably cestodes, life cycles may include a "larval" stage in a prey species and the "adult" stage in a predator. As yet, we lack specifics on most of these fascinating "foodchain" related herbivore/carnivore/helminth associations. Do pesticide-promoting monocultures -such as bermuda grass or pine plantations - break or enhance these cycles?

One may wonder exactly how and when mammalian participants initiate these host/helminth relationships? Exactly what kinds of life histories do these parasites have? Are host offspring infected directly by actions of their "wormy" mothers or by the practice of coprophagy or whatever?

Sure, a tapeworm may take its own "sweet" time in growing to be several feet in length in a human's intestinal tract, because its host is longlived. However, in a deer mouse, for example, life-time is drastically short. In one of these ephemeral hosts, a helminth must first make proper contact, then develop to maturity, and finally produce viable reproductive products before its gravy train for a few weeks at most gives out.

Currently we know considerable about host/parasite interactions in domesticated carnivores and livestock and hoofed game species but shockingly less about those of other non-human mammals. An inventory of the helminths of Texas mammals is far from complete. We also need more data about helminth life histories, behaviors, host specificities, host reactions, etc. Much of this kind of data-gathering requires a mammalogist/helminthologist combo with little need for travel expenses since the mammals in a nearby pasture, wood lot or wetland are prime subjects for study.

Attention professorial types! The next time your department is in the market for an invertebrate zoologist, persuade your search committee to interview a capable helminthologist. Where else in nature do you find creature-careers beset with so much survival uncertainty as among helminths? And we know so little about this fascinating host/helminth business when it relates to mammals and their welfare.

INFORMATION ON PROGRAMS OF TSM MEMBERS

EDITOR'S NOTES: The following accounts are alphabetized by institution, department and researcher. Spelling was generally not checked on text received electronically. Any errors or inaccuracies are unintentional. Text from the previous year was used for those programs for which a response to the questionnaire was not received in time for printing of this issue.

ABILENE CHRISTIAN UNIVERSITY

Department of Biology

Box 27868

Abilene, TX 79699

Thomas E. Lee, Jr.

PHONE: (915) 674-2574

FAX: (915) 674-2009

EMAIL: lee@biology.acu.edu

Research Interests, Projects and Grants: Molecular phylogenetics and taxonomic revision of the genus *Tonatia* with Ron Van Bussche and Steve Hooper.

Undergraduate Students and Their Research:

Sarah Weyandt is conducting a study on the Bats of Eagle Nest Canyon, Val Verde County Texas.

Mammalian Species:

Rebecca Belcher is working on *Arctocephalus townsendi*.

Joshua Brokaw is working on *Cephalorhynchus commersonii*.

Joanna Scott is working on *Vampyress bidens*

ANGELO STATE UNIVERSITY

Department of Biology

San Angelo, TX 76909

Robert C. Dowler

PHONE: (915) 942-2189 ext. 239

FAX: (915) 942-2184

EMAIL: robert.dowler@angelo.edu

Research Interests, Projects and Grants: This past year I completed five weeks of field studies on rodents in the Galapagos Islands with colleagues Terry Maxwell (ASU), Tom Lee (Abilene Christian University) and graduate student, Joel Brant. In Texas, we have finished a project to survey mammals, birds, reptiles and amphibians at the Devils River State Natural Area in Val Verde County and are finalizing a project on mammals of San Angelo State Park. I recently received funding to begin a radiotelemetry study of hog-nosed skunks (*Conepatus mesoleucus*) and striped skunks (*Mephitis mephitis*) in areas near San Angelo.

Graduate Students and Their Research:

- Joel G. Brant - Joel completed his M.S. degree with his thesis, "A survey of the mammals of Devil's River State Natural Area and relative abundance of small mammals in the area", in August 2000. He has begun pursuit of a Ph.D. degree at Texas Tech University under the direction of Dr. Clyde Jones.
- Eddie K. Lyons - (Co-chaired with Dr. Dale Rollins, Texas A&M University) Thesis topic: Effects of short term predator control on nesting success and survival of Northern Bobwhites (*Colinus virginianus*).
- Marisol Salazar - Thesis research will deal with home range, habitat selection, and foraging patterns of striped skunks using radiotelemetry.
- Spencer Stewart - Thesis research to examine home range, habitat selection, and foraging patterns of hog-nosed skunks using radiotelemetry.

Additional Information: The Angelo State Natural History Collections are publishing the ASNHC Newsletter, an annual synopsis of activities and research in our systematic collections. If you would like to be on our mailing list, please contact Robert Dowler, Terry Maxwell or Ann Maxwell.

Recent publications from the Angelo State Natural History Collections:

Dowler, R. C., D. S. Carroll, and C. W. Edwards. 2000. Rediscovery of rodents (Genus *Nesoryzomys*) considered extinct in the Galapagos islands. *Oryx* 34(2):109-117.

Brant, J. G. and R. C. Dowler. 2000. Noteworthy record of the Seminole bat, *Lasiurus seminolus* (Chiroptera: Vespertilionidae), in Val Verde County, Texas. *Texas Journal of Science* 52(4):353-355.

Husak, M. S. and T. C. Maxwell. 2000. A review of the 20th century range expansion and population trends of the Golden-fronted Woodpecker (*Melanerpes aurifrons*): Historical and ecological perspectives. *Texas Journal of Science* 52(4): 275-284.

BAT CONSERVATION INTERNATIONAL

**P.O. Box 162603
Austin, Texas 78716**

Brian W. Keeley

PHONE: (512) 327-9721

FAX:(512) 327-9724

EMAIL:bkeeley@batcon.org

WEB PAGE ADDRESS:www.batcon.org

Research Interests, Projects and Grants: Director: North American Bat Conservation Partnership.
Project coordinator: Mexican long-nosed bat (*Leptonycteris nivalis*) surveys in Trans-Pecos Texas and Northeastern Mexico. Interested in bat/plant interactions in tropical forest canopies.

BAYLOR UNIVERSITY
Department of Biology
P.O. Box 97388
Waco, Texas 76798-7388

Wendy Sera

Phone: 254-710-6794 (Office and Voicemail)
254-710-2911 (Dept. office)

FAX: 254-710-2969

EMAIL: Wendy_Sera@Baylor.edu

Web Page Address: http://www.baylor.edu/~Biology/Home_Page.html

Research Interests, Projects and Grants: The population and behavioral ecology of mammals; prairie vole social behavior and mating systems; the landscape ecology of mammals inhabiting the Chihuahuan Desert and Chisos Mountains in the Big Bend of Texas.

Graduate Students and Their Research:

Tracy Carter (M.S. student) --The effect of landscape heterogeneity on the diversity of medium and large-sized mammals at Big Bend National Park.

Cathy Early (Ph.D. student) --Fox squirrel foraging behavior: A test of a model of sciurid urbanization.

Richard Howard (M.S. student) --Water demand as a constraint on *Sigmodon hispidus* feeding behavior.

Undergraduate Students and Their Research:

Arthur Chavason (Honors Thesis) --The evolutionary advantage of biparental care in prairie voles (*Microtus ochrogaster*).

Brian Moore (co-adviser with Joseph White; Undergraduate Research) --Variation in edaphic, biological, and biochemical conditions along an old-field successional gradient in Central Texas.

BAYLOR UNIVERSITY
Department of Biology and Graduate School
Waco, TX 76798-7388

Kenneth T. Wilkins

PHONE: (254) 710-2911

FAX: (254) 710-2969

EMAIL: Ken_Wilkins@Baylor.edu

WEB PAGE ADDRESS: http://www.baylor.edu/~Ken_Wilkins/

Research Interests, Projects and Grants: My research interests (and generally those of my graduate students) pertain to natural history, ecology, and biogeography of modern and fossil small mammals (primarily rodents and bats). We have recently concluded surveys of terrestrial vertebrates (mammals and herps) at Hill Country State Natural Area and Pedernales Falls State Park; the project was funded by Texas Parks & Wildlife Department. I have a continuing interest in morphological features as adaptations to particular lifestyles (e.g., our recent work in functional morphology of

hearing in subterranean rodents). And, I am always eager to visit with prospective graduate students! Please visit my web site (URL above) and that of the Baylor Biology Department [http://www.baylor.edu/~Biology/Home_Page.html].

Graduate Students and Their Research:

Cathy Early, a graduate of Howard Payne University, is developing a dissertation project related to behavioral reproductive ecology of small mammals. In the meanwhile, she is coauthoring with Dr. Wendy Sera a Mammalian Species manuscript and a paper on behavioral ecology of voles.

Jeff Sammon has just completed his MS thesis on the effects of an exotic grass (King Ranch bluestem) on the composition of the small-mammal community in Central Texas. Congratulations!! Jeff's work was conducted at the Texas Parks & Wildlife Department sites noted above. Having graduated in December 2000, Jeff is now in search of gainful employment related to his background in vertebrate ecology. Please contact us if you have any leads!

Jeff Scales joined our masters program in Fall 2000. He hails from the Pacific Northwest where he studied at University of Puget Sound and was a research associate at Oregon State University. He'll work on a project relating to urban ecology of Mexican free-tailed bats.

Undergraduate Students and Their Research:

David Brandon, an undergraduate Honors program student, completed his Honors thesis concerning relationship of food (plant biomass) density to densities of subterranean herbivores (pocket gophers). David is now attending medical school at the University of Houston.

Additional Information: During Summer 2000, Baylor sponsored one of the NSF Research Experiences for Undergraduates program (web site: <http://www.baylor.edu/~Biology/ProjectSummary.htm>). The principal investigators are Drs. Wendy Sera and Ann Rushing, both members of the Department of Biology faculty. Two of the undergraduates (Pam McKernan, SUNY Geneseo; Sherry Skanadore, Bartlesville Wesleyan College, Oklahoma) worked with me and my graduate students on small-mammal ecology projects. Funding for this program runs for at least two more summers. . . so, please encourage your undergraduates to consider this as a possible summer activity.

Chapala Ecology Station is in full swing again this summer! Since 1993, we have offered course work and research opportunities each summer at this field station on the shores of Lake Chapala (just south of Guadalajara, Jalisco). The station is cooperated by Baylor University and Universidad Autonoma de Guadalajara. For Summer 2001, the station is open during the second summer term (July-August). I will team-teach a senior/graduate course, Field Studies in Biology, that will emphasize ecology of mammals and birds. For information on other courses, please consult the CES web site: <http://www.baylor.edu/~ces/>

I continue as Editor for Reviews for the Journal of Mammalogy. Please consider authoring a review for titles listed in the "Books Received" column in the Journal.

COLUMBIA UNIVERSITY
Center for Environmental Research and Conservation
1200 Amsterdam Ave.
New York, NY 10025

Juan Carlos Morales

PHONE: (212) 854-9490

FAX: (212) 854-8188

EMAIL: jcm19@columbia.edu

Research Interests, Projects and Grants: Interested in systematics and biogeography, and conservation genetics of mammals Research projects on systematics and biogeography of Southeast Asian Primates (NSF grant) and Rodents (NSF grant). Conservation genetics of the rhinoceros (IRF and USFWS grants) Systematics and biogeography of the genus *Lasiurus* Bats of Sulawesi Conservation Genetics of Coatis and Raccoons of Cozumel Island.

Graduate Students and Their Research:

Rasit Bilgin: migratory bats of Turkey
 Badrul Md. M. Zain: Phylogeny of the genus *Presbytis* (Primates: Colobini)
 Michael Campbell: Molecular phylogeny of the Asian colobines
 Livia Leon: Molecular biogeography of the genus *Habromys*

Undergraduate Students and Their Research:

Sabina Abrol: systematics of Sulawesi rodents

COLUMBUS STATE UNIVERSITY
College of Science
4225 University Ave
Columbus, GA 31907

Art Cleveland

PHONE: (706) 568-2056

FAX: (706) 569-3133

EMAIL: cleveland_art@colstate.edu

WEB PAGE ADDRESS: <http://cos.colstate.edu/>

Research Interests, Projects and Grants:

Continued China research in small mammals
 Currently writing four Mammalian Species accounts
 Distribution and status of several species of bats in Georgia
 Funded study of the bats of Callaway Gardens, GA

Graduate Students and Their Research:

Patty Kosky graduated with her MS in August on “Land management and rodent populations of Ft Benning.”
 Michelle Smith is working on the”distribution and environmental factors effecting *Corynorhinus rafinesquii*”
 (MS Thesis)

Undergraduate Students and Their Research:

Toney Griffin is working on “Endoparasitic levels and eosinophil levels in *Dasypus*.”
 Keith Edmonds is conducting a “Mammal survey of Talbot Co, Georgia”

McMURRY UNIVERSITY
Department of Biology
Abilene, TX 79697-0368

Robert E. Martin

PHONE: (915) 793-3870

FAX: (915) 691-0937

EMAIL: martinr@mcmurryadm.mcm.edu

Research Interests, Projects and Grants: Status report on Texas kangaroo rat.

MIDWESTERN STATE UNIVERSITY
Department of Biology
Wichita Falls, TX 76308

Frederick B. Stangl, Jr.

PHONE: (940) 397-4408

EMAIL: stanglf@nexus.mwsu.edu

WEB PAGE ADDRESS: www.mwsu.edu

Research Interests, Projects and Grants: Continuing interests in various aspects of Texas mammals.

Graduate Students and Their Research:

Robert Smith-mammals of Grayson Co., Texas

Neal Robertson-morphometric analysis of *Peromyscus eremicus* from Trans-Pecos Texas.

Desna St. Louis-morphometric analysis of *Peromyscus pectoralis* from Trans-Pecos Texas

Additional Information: For those not already aware, Walter W. Dalquest recently passed away at the age of 83. Obituary with details and life history pending in J. Mamm.

NEVADA STATE MUSEUM
Natural History Program
600 North Carson Street
Carson City, NV 89701

George D. Baumgardner

PHONE: (775) 687-4810 ext. 236

FAX: (775) 687-4168

EMAIL: gdbaumga@clan.lib.nv.us

Research Interests, Projects & Grants:

Distribution of mammals in Nevada. This reflects part of the mission of the Nevada State Museum and is, thereby, an ongoing project. It is not a current objective of this project, however, to generate any type of update of the "Mammals of Nevada" by E. R. Hall.

In addition to the general work I will be doing this next year, I hope to begin a more detailed study of the mammals occurring in the Pine Nut mountain range, which occurs near my home. This mountain range is located just a little east of the Sierra Nevada but because it does not have much elevation it has not been previously surveyed.

Possible impacts of estrogen agonist bisphenol-A on *in utero* development and growth of the skeleton in mice (with Fred vom Saal & Michael Smolen, Funded by World Wildlife Fund)

Intra- and interspecific relationships of mammals using morphometric analyses

Conservation and restoration of damaged vertebrate natural history collections

Additional Information: The Nevada State Museum (NSM) in Carson City is the principle museum for the state. Part of its mission is to document and interpret the natural history of Nevada for its residents. This museum is part of the government of this state and is not directly affiliated with any college or university system.

A recent contribution to my work here has been the building of a new skeletal preparation facility (Bug Box). So far, this building has managed to keep the buggies alive during the winter. To my knowledge this is the only bug box operating in the state. With this better facility I can now begin to clean the skeletons and catalog the animals I have been collecting for the past two years. It is also my understanding that this mammal program is the only one in the state that is routinely depositing the material it obtains in the state of Nevada.

During this past year I has been quite busy in preparing an "Education Kit" highlighting mammalian skulls for use by local schools. I have also had some limited involvement in is in maintenance and updating the Natural History Galleries and the creation of a temporary exhibit.

OKLAHOMA STATE UNIVERSITY

Department of Zoology

430 Life Sciences West

Stillwater, OK 74078

Karen McBee

PHONE: (405) 744-9680

FAX: (405) 744-7824

EMAIL: mcbec@okstate.edu

WEB PAGE ADDRESS: <http://zoology.okstate.edu>

Research Interests, Projects and Grants: My lab uses several genetic techniques to investigate relationships between exposure to environmental pollutants and induction of genetic damage in wildlife species and to explore how induced genetic damage may translate into long term population demographic effects. In collaboration with Ron Van Den Bussche's lab, we also use molecular techniques to investigate how exposure to environmental stressors may result in selection for specific genotypes thereby altering genetic structure of populations. I am also interested in mammalian systematics and evolution, and my lab uses cytogenetic and molecular tools to investigate phylogenetic and phylogeographic relationships of mammals. I am also Curator of Vertebrates for the Oklahoma State University Collection of Vertebrates

Grants: An assessment of digital and analog assistive technology for the dissection intensive laboratory. Regional Alliance for Science, Engineering, and Mathematics for Students with Disabilities. (RASEM). D. French and K. McBee.

Center for Metals Research in the Environment. Federal Appropriation for establishing the center with University of

Delaware, University of Missouri-Rolla, Colorado School of Mines, Manhattan college, University of Wyoming, McMaster University, and Oklahoma State University, R. P. Lanno, N. Basta, and K. McBee.

Graduate Students and Their Research:

Gregory M. Wilson, Ph.D., Phylogeography of boreal-adapted small mammals.

Undergraduate Students and Their Research:

Emily Ackland, Curation of Rodentia within OSU-COV

OKLAHOMA STATE UNIVERSITY
Department of Zoology
430 Life Sciences West
Stillwater, OK 74078

Ronald A. Van Den Bussche

PHONE: 405-744-9679

FAX: 405-744-7824

EMAIL: ravdb@okstate.edu

Research Interests, Projects and Grants: My research interests focus on three general areas: mammalian molecular systematics (primarily of bats), conservation genetics, and evolution of the mammalian Major Histocompatibility Complex (MHC). I currently have several research projects and grants that focus on these three research interests with mammals, fish, and birds. Regarding mammalian systematics, my laboratory is currently funded by NSF to examine the higher-taxonomic level phylogenetic relationships among all microchiropteran families through the use of DNA sequence variation from the mitochondrial ribosomal genes. One long-term research interest of mine is to elucidate the phylogenetic relationships with Vespertilionidae, and I currently have a Ph.D. student that has sequenced the mtDNA ribosomal genes from approximately 130 vespertilionids (see Steve Hooper, below).

Graduate Students and their Research:

Steven R. Hooper (Ph.D.)--Steve's research is to elucidate the higher level phylogenetic relationships within Vespertilionidae. To address this topic, Steve has sequenced the mtDNA ribosomal genes from approximately 130 vespertilionid bats.

Greg Wilson (Ph. D.—Co-advised with Dr. Karen McBee)--Gregs dissertation research is entitled "Post Pleistocene Habitat Fragmentation and Intraspecific Phylogeography of Boreal-adapted Mammals in Wyoming and Adjacent States". To address this topic, Greg is using a combination of DNA sequencing and restriction fragment length polymorphisms to phylogeographic patterns among four mammalian taxa.

Terry Malloy (Ph.D.—Co-advised with Dr. Anthony Echelle)--Terry's dissertation is entitled "Genetic structure of mixed native/non-native smallmouth bass populations in two Oklahoma reservoirs". Terry is using microsatellite analyses to assess the impact of the introduction of non-native smallmouth bass on the genetic structure of native populations of smallmouth bass (i.e., degree of hybridization).

Warren Caughlin (MS—Co-advised with Dr. Anthony Echelle)--Warren's thesis is entitled "Genetic structure of spotted bass (*Micropterus punctulatus*) in the Red River Basin". To address this topic, Warren is using a combination of microsatellite analysis and DNA sequence variation of the mtDNA control region.

Silvia Frutos (MS)--Silvia is from Paraguay and is examining the genetic structure of nine-banded armadillos in Paraguay and the impact that hunting by indigenous peoples has on the partitioning of genetic variation within and among populations. The overall goal of this study is to provide information to the Paraguayan government for the management of this taxon.

Sarah Moore (MS)--Sarah's is performing a microsatellite analysis of essentially every individual of a Gunnison's prairie dog population collected over a five year period. These data will be used to address questions related to the social structure of prairie dogs (i.e.,maternity, paternity, multiple paternity, communal nesting, communal nursing, inbreeding, and infanticide).

Derrick Chappell (MS)--Derrick is examining genetic variation within and among populations of wolverines from the Northwest Territories and Nunavut Canada through the use of microsatellites and DNA sequence analysis of the mtDNA control region.

Undergraduates and their Research:

Eric Hansen—Eric works on a variety of projects including bat systematics and parentage testing in mammals and birds.
Serena Reeder—Serena is working on molecular systematics of bats through the use of DNA sequence analysis of the nuclear Recombination Activator Gene 2 (RAG2) and the Dentin Matrix Protein 1 (DMP1) genes.

Additionally, Serena is currently examining matrilineal structuring of white-tailed deer in New York through the use of DNA sequence analysis of the mtDNA control region.

Raymond Ary—Although Raymond is still an undergraduate, he has begun his MS research in my laboratory.

Raymond's research will involve the effect of management practices on three populations of raccoons in northern Illinois. More specifically, we are interested in the effects on the genetic structure of populations when approximately ½ of the population is removed. To address this topic, Raymond is currently building a microsatellite library and then will use 10 microsatellite loci and DNA sequence analysis of the mtDNA control region to address this topic.

Additionally, I have three other undergraduate students learning molecular techniques in the laboratory by helping the above listed students.

Additional Information: In addition to the above listed project, various students are also working on the genetic structure of black bears from Big Bend, Texas and Mexico; genetic structure of bobwhite quail, and genetic structure of lesser prairie chickens.

I am always looking for hard-working students with interests in molecular systematics, population genetics, and conservation genetics. If you have interests in any of these areas and are looking for a graduate program, please feel free to get in touch with me or talk with me at this years meeting.

SOUTHWEST TEXAS STATE UNIVERSITY

**Department of Biology
San Marcos, TX 78666**

Richard W. Manning

PHONE: (512) 245- 8037

FAX: (512) 245 - 8713

EMAIL: rm11@swt.edu

WEB PAGE ADDRESS: <http://www.bio.swt.edu/manning/manning.html>

Research Interests, Projects and Grants: Small mammals in Central Texas and adjacent areas

Graduate Students and Their Research:

Melissa McCulley - Radio-telemetry on beaver at Aquarena Spring Lake.

Sue Riley -- undecided, maybe *Blarina* in Bastrop County, Texas.

Kathy Townes. Food habits of nutria at Spring Lake.

TARLETON STATE UNIVERSITY
Department of Biological Sciences
Box T-0100
Stephenville, TX 76402-0100

Philip D. Sudman

PHONE: (254) 968-9154

FAX: (254) 968-9157

EMAIL: sudman@tarleton.edu

WEB PAGE ADDRESS: www.tarleton.edu/~biology/pdshp.html

Research Interests, Projects and Grants: I continue to look at the historical biogeography of *Geomys* based on phylogenetic information derived from the cytochrome b gene. Other research involves microsatellite variation in Attwater's prairie chickens associated with the captive breeding program for this endangered bird; genetic diversity in the mud crab (*Rhithropanopeus harrisi*), a marine species which has turned up in large numbers in several Texas lakes; and the effects of prescribed burn frequency on reptile communities.

Graduate Students and Their Research:

Rex McAliley: "Genetic differentiation of pocket gophers within the Edwards Plateau of Texas."

Brandon Mobley: "Microsatellite analysis of *Tympanuchus cupido attwateri*: paternity testing."

Michelle Stoley: "Historical analyses of microsatellite variability in Attwaters prairie chickens."

Michael Votaw: "Genetic assessment of the origin of populations of estuarine mud crabs (*Rhithropanopeus harrisi*) recently found in three inland lakes in Texas."

Ray Willis: "Effects of burn frequency on reptile utilization of upland habitats in Edwards County, TX."

Undergraduate Students and Their Research:

Jennifer Journey: Molecular sexing of avian species and genetic testing for infection with the REV virus.

Additional Information: Just starting new cooperative research with captive breeding of the endangered Guam Rail and Mariana Crow.

TEXAS A&M UNIVERSITY – COLLEGE STATION
Department of Biology
College Station, TX 77843-3258

Ira F. Greenbaum

PHONE: (979) 845-7791

FAX: (979) 845-3114

EMAIL: ira@mail.bio.tamu.edu

WEB PAGE ADDRESS: <http://www.bio.tamu.edu/FACMENU/faculty/greenbau.htm>

Research Interests, Projects and Grants: The research in this laboratory is focused around questions concerning chromosomal rearrangement, and its role(s) in mammalian evolution. Although this usually involves assessments of intraspecific (populational) chromosomal polymorphism, the data are generally applicable to systematic interpretations and considerable attention is paid to the phylogenetic relationships and higher taxonomic patterns of chromosomal evolution. The deer mice of the *Peromyscus maniculatus* species group continue to be our primary animal model.

Our recent research is focused in two directions, the evolutionary relevance of chromosomal fragile sites and resolving the systematics of the *P. maniculatus* species group. The former has involved experimental analyses and the development of a statistical framework for chromosomal breakage data. Our initial goals include documenting the variability and evolution rate and pattern of chromosomal fragile sites in *Peromyscus*. Concerning the latter we have discovered a chromosomal character which appears to distinguish the eastern forest and central grassland forms of *P. maniculatus*. To facilitate a more fine-scale resolution of genetic interactions among populations of deer mice, we (in collaboration with Rodney Honeycutt) have recently described a set of microsatellite markers from central *P. maniculatus*. We are currently pursuing initial assessments of the populational variation of these markers and investigating the pattern of evolution of these characters among the species in the *P. maniculatus* group. We plan to actively pursue a phylogenetic/population genetic/biogeographic approach to fully resolving the taxonomy, systematics and modes of speciation in the *P. maniculatus* species group.

Graduate Students and Their Research:

Scott Chirhart. Doctoral Student, Zoology. Microsatellite evolution in the *Peromyscus maniculatus* species group.

Deepa Deshpande. Non thesis Masters Student

Tamara Gilbert. Masters Student, Zoology. Microsatellite variation in *Peromyscus maniculatus* from the northeastern United State and eastern Canada.

Jeshu Weerasinghe. Doctoral Candidate, Zoology. Evolution of fragile sites in the *Peromyscus maniculatus* species group.

Undergraduate Students and Their Research:

Roosbeh Arianpour. mtDNA variation and the genetic identification of *Peromyscus* from Triangle Island, British Columbia.

TEXAS A&M UNIVERSITY
Department of Wildlife & Fisheries Sciences
2258 TAMUS
210 Nagle Hall
College Station, TX 77843-2258

Rodney L. Honeycutt

PHONE: (979) 847-9462 (office), (979) 847-9463 (lab)

FAX: (979) 845-4096

EMAIL: rhoneycutt@tamu.edu

Research Interests, Projects and Grants: Molecular phylogenetics of mammals, specifically caviomorph and phiomorph rodents. This grant is funded by the National Science Foundation. In addition, I am interested in the population genetics of white-tailed deer and mammalian conservation genetics.

Graduate Students and Their Research:

Larry Frabotta (Ph.D.) - Molecular Phylogenetics of Rodents
 Colleen Ingram (Ph.D.) - Population Genetics and Molecular Evolution of African Mole-Rats
 Diane Rowe (Ph.D.) - Molecular Phylogenetics of Caviomorph Rodents
 Jennifer Shipman (MS) - Phylogeography of Ruffed Grouse.

Undergraduate Students and Their Research:

Katie Connell (Undergraduate) - Molecular Phylogenetics of *Ctenomys*

Additional Information: Several of my students recently graduated. Joel Anderson (MS) did a thesis on white-tailed deer population genetics and is now doing a Ph.D. at University of Massachusetts. Kiara Banks just finished her MS on the Conservation Genetics of the Florida Key Deer. Katherine Dunn finished her Ph.D. on the Molecular Phylogenetics of Skates and Rays and is now doing a postdoc with J. Yang at Kings College London. Arnulfo Moreno-Alvarez finished a Ph.D. on the Ecology of the Mexican Long-nosed Bat and is a professor at the University of Tamulipas. Catherine Malone finished a Ph.D. on the Conservation Genetics of Iguana and now has a postdoc at Purdue University.

Ira Greenbaum and my laboratory are collaborating on a project pertaining to microsatellite DNA evolution and speciation in the *Peromyscus maniculatus* complex. We recently submitted a collaborative proposal to NSF on this topic.

TEXAS A&M UNIVERSITY
Department of Wildlife & Fisheries Sciences
Texas Cooperative Wildlife Collection
2258 TAMU
College Station, TX 77843-2258

Duane A. Schlitter

PHONE: (979) 845-5783

FAX: (979) 862-7750

EMAIL: dschlitter@tamu.edu

Research Interests, Projects and Grants: Research continues on the systematics, biogeography and conservation of mammals of Africa and Asia. Projects being finished involve the descriptions of two new Recent species of African vespertilionids and one new species of African Miocene molossid; a review of taxonomic relationships and geographic distribution of species of East African spiny mice of the genus *Acomys*; a review of the taxonomic relationships of Indian species of *Hipposideros*; a taxonomic review of species of African Laephotis; the systematics of the African genus *Cistugo* and its relationships to the genus *Myotis*; a systematic review of the species of the Asian genus *Tylonycteris*; a review of the taxonomy and geographic distributions of African species of the subgenus *Pipistrellus* (Neomoricea) and a taxonomic review of the species of the African genus *Petromyscus*. A large ongoing project involves a review of all of the species of rodents of Africa with the late Gerrit DeGraaf of South Africa. The following two new projects have been funded recently and should begin this calendar year. At the invitation of Ethiopians, we are initiating an inventory of higher vertebrates of the unique Aningeria forests of southwestern Ethiopia to assist in setting up new forest and nature reserves in the area, train Ethiopian students in the identification of species of birds and mammals, and enhance capacity and capability building in the Zoological Natural History Museum at Addis Ababa University. The second project involves the development of new ecotourism options for private land owners in extreme southern Namibia while exploring the conservation status and identification of unique equids in the region.

TEXAS A&M UNIVERSITY – CORPUS CHRISTI
Department of Physical AND Life Sciences
6300 Ocean Drive
Corpus Christi, TX 78412

PHONE: 361-825-2369

FAX: 361-825-2795

EMAIL: ghickman@falcon.tamucc.edu

WEB PAGE ADDRESS: Under renovation!

Research Interests, Projects and Grants: Vertebrates; Working on a research area for the Corpus Christi Zoo; Grants requested for the study of the burrowing owl.

Graduate Students and Their Research: Pocket gophers, artificial burrows, digestion in snakes, nesting ecology of passerines, invasive grasses, and ducks and seagrasses.

Undergraduate Students and Their Research: Bird surveys.

Additional Information: The new Science and Technology building will be operational by August, when I will be moving offices. Lab space will be at a premium this summer as the roof is coming off the Center for Sciences for building renovations.

TEXAS A&M UNIVERSITY
Marine Mammal Research Program (Galveston) and
Department of Wildlife & Fisheries Sciences - College Station)
4700 Ave. U, Bldg. 303
Galveston TX, 77551-5923

Bernd Würsig

Phone: 409-740-4413

FAX: 409-740-4717

EMAIL: wursigb@tamug.tamu.edu

Research Interests, Projects and Grants: Behavioral ecology of cetaceans, with an emphasis on effects of human habitat change. Specific research on bowhead whales, dusky dolphins, bottlenose dolphins, gray whales in far east Russia, and river dolphins.

Graduate Students and Their Research:

Similar to above

Undergraduate Students and Their Research:

Similar to above, as assistants

Additional Information: Look for the new book: Würsig, B., T.A. Jefferson, and D. Schmidly. 2000 (March). The Marine Mammals of the Gulf of Mexico. 304 pages and over 50 color illustrations and photos. Texas A&M University Press, College Station, TX. \$35.

TEXAS A&M UNIVERSITY-KINGSVILLE
Associate Vice President for Academic Affairs
700 University Ave.
MSC 102
Kingsville, TX 78363

Steve Smith

PHONE: (361) 593-3098

FAX: (361) 593-3107

EMAIL: sa-smith@tamuk.edu

Research Interests, Projects and Grants: General interest in mammalian evolution, ecology, and systematics. Currently one funded mammalian project to investigate the effects of roller-chopping on vegetation, mammifauna and herpetofauna of the Chaparral Wildlife Management Area (funded by TPWD)

Graduate Students and Their Research:

Victor French: Sperm competition in two species of *Peromyscus*

Keith Krakauer: Effects of roller-chopping on vegetation, mammals and herptiles

TEXAS A&M UNIVERSITY –TEXARKANA
Department of Biology
Texarkana, TX 75505

Chris T. McAllister

PHONE: (903) 223-3133

FAX: (903) 223-3120

EMAIL: chris.mcallister@tamut.edu

WEB PAGE ADDRESS: www.tamut.edu/~mcallister/mcallister.html

Research Interests, Projects and Grants: I am most interested in natural history and ecology of amphibians and reptiles; however, some of our research involves mammals, particularly new-world rodents and bats. Future projects include the following:

- (1) Cross-transmission studies of coccidian parasites of rodents,
- (2) The life cycle of a *Sarcocystis* sp. (Protista: Apicomplexa) in western diamondback rattlesnakes that probably uses *Neotoma* spp. as intermediate hosts,
- (3) A survey of fleas and ticks of small mammals from the Ark-La-Tex,
- (4) A survey of the small mammals of extreme northeastern Texas,
- (5) Coccidia of bats.

Graduate Students and Their Research: TAMU-T (Biology Department) is an undergraduate institution.

Undergraduate Students and Their Research:

Jeremy Carmack-yet to be determined.

Brad Hejduk-yet to be determined.

Randy Jackson-yet to be determined.

Josh Kessler-yet to be determined.

Additional Information: The Biology Department of TAMU-T is a new program started in August 2000. We are beginning to recruit additional undergraduate students in Independent Research (BSC 464). Other members of the Biology Department include Dr. David Allard (Science Education and Microcrustaceans) and Dr. John Johnson (Neuroscience). We plan to offer a course in Field Biology in Summer 2001 that will involve vertebrates of the AR-LA-TEX region.

TEXAS TECH UNIVERSITY

Texas Tech University has a history of a strong commitment to mammalogy. Several events this year strengthen this devotion to our beloved taxon. First, Dr. David J. Schmidly has been named President of Texas Tech. His inauguration ceremonies will be held January 27th. Perhaps you will recall that David is from Levelland and received two degrees (B.S. and M.S. directed by Dr. Robert L. Packard) from TTU, so this is a "local boy makes good" scenario. Dr. James S. Findley, our esteemed colleague, made the observation that mammalogists have been incredibly successful at educational endeavors that extend far beyond those typical of taxon-related activities. He concluded that "if you want a job done right, choose a mammalogist." We are very pleased to have our university led by a mammalogist and we look forward to many great things during President Schmidly's tenure. It is worthy to note that David continues his mammalogical activities, publishing a marine mammal book in 2000 (Wursig, Jefferson, and Schmidly, Marine Mammals of the Gulf of Mexico), revisiting the biological survey of Texas documenting one hundred years of change, directing graduate students, and serving on graduate committees.

A second significant event is that Texas Tech has made a strong commitment to Biological Informatics. This commitment includes a faculty line and substantial monetary investment in Biological Informatics hardware and a state-of-the-art Bioinformatics/GIS facility in our new research building. Ground breaking for this building will take place in May of 2001. Dr. Ron Chesser has been hired to head our Biological Informatics program, thus adding another mammalogist to our faculty.

Third, we have received major funding to support field expeditions in each of the next two summers. Additionally, we anticipate being able to award grants for future collection of museum voucher specimens to further research of mammalian systematics. Naturally, students will be involved in all aspects of these activities.

Fourth, we have upgraded the publication series of the Texas Tech Museum. The format is 8 1/2 X 11 page size; individual covers can be customized for a specific article; and color is an option. This series is open not only to Tech faculty and students, but also to faculty and students at other institutions. For example, the most recent issue (203), "Two new genera and species of halphytic desert mammals from isolated salt flats in Argentina," by Michael A. Mares, Janet K. Braun, Ruben M. Barquez, and M. Monica Diaz, is by authors not affiliated with TTU.

For further information, visit our website at www.biology.ttu.edu and www.nsrl.ttu.edu.

(Submitted by Robert J. Baker)

TEXAS TECH UNIVERSITY
Department of Biology and Museum of Texas Tech
Lubbock, TX 70409

Robert D. Bradley

PHONE: (806) 742-2725

FAX: (806) 742-2963

E-MAIL: izrdb@ttacs.ttu.edu

WEB PAGE: Biology - <http://www.biol.ttu.edu/> ; Museum - <http://www.nslr.ttu.edu/>

Research Interests, Projects, and Grants: My research interests include systematics and molecular evolution in mammals, particularly in geomyoid and sigmodontine rodents. Examination of hybrid zones between genetically distinct taxa; including isolating mechanisms and the dynamics of genetic introgression. Determining the origin of hybridzymes generated from hybridization events. Chromosomal evolution and how changes in chromosome structure relate to models and mechanisms of speciation. Examination of the origin and evolution of rodent-borne viruses; especially in the use of rodent phylogenies and genetic structure to predict the transmission and evolution of viruses. Growth and utilization of natural history collections, especially those pertaining to mammals. Development of bioinformatics and how this field can be interphased better with natural history collections. Natural history and distributions of mammalian species.

Current Projects:

- Systematics and phylogenetic studies of *Peromyscus boylii*.
- Phylogenetic relationships of Neotomine and Peromyscine rodents.
- Systematics and phylogenetic studies of the genus *Sigmodon*.
- Systematics and phylogenetic studies of the genus *Neotoma*.
- Ecology of emerging arenaviruses in the southwestern US.
- Emerging and re-emerging rickettsioses in Latin America – flying squirrels as a host.

Current Graduate Students & Their Research:

Darin Carroll (PhD), is in his third year.....Mitochondrial and Nuclear DNA variation in *Sigmodon*.
 Kristina E. Halcomb (MS), in her first year.....Molecular Systematics of the *Peromyscus truei* Species Group.
 Francisca Mendez-Harclerode (PhD), is in her first year.....Undecided but her dissertation will involve some aspect of mammalian systematics.

Additional Information:

- Darin M. Bell.....Howard Hughes and Goldwater Fellow. Darin completed his undergraduate degree and is now pursuing a MD/PhD degree at the Southwest School of Medicine..
- Melinda Clary (MS) completed her thesis.....Habitat preference and movement of small mammals at the Ft. Bliss Military Base. Melinda accepted a position with Wendy Lopez and Associates in Dallas, TX.
- Cody W. Edwards (PhD) completed his dissertation.....Molecular systematics of the genus *Neotoma*. Cody is considering a postdoc position with Drs. David M. Hillis and James J. Bull at the University of Texas.

TEXAS TECH UNIVERSITY
Department of Biological Sciences
Lubbock, TX 79409

Robert J. Baker

PHONE:(806) 742-2702

FAX:(806) 742-2963

EMAIL: rjbaker@ttu.edu

Research Interests, Projects and Grants: My interests encompass the ability to dissect the genome in an efficient way to provide resolution to problems concerned with systematics, conservation, biodiversity, genotoxicology, agriculture, etc. Major projects in the lab include understanding the biological consequences of the meltdown of the nuclear reactor at Chornobyl, understanding chromosomal evolution, especially using fluorescent *in situ* hybridization, providing genetic markers for cultivars of cotton, and my first love, determining the systematics of the New World leaf-nosed bats (Family Phyllostomidae). We published a gene tree for the Phyllostomidae based on the nuclear gene *RAG2*, based on sequence from representatives of over 50 genera. In collaboration with Ron Van Den Bussche, Steve Hooper, and Calvin Porter, we expect to publish the mitochondrial ribosomal gene sequences for these same taxa and use this as the basis for a revised classification for this bat family. The Chornobyl project is part of a larger project headed by Dr. Ron Chesser.

Postdoctoral Research Associates:

Calvin A. Porter was recently appointed as a Visiting Assistant Professor, and he is working on the molecular systematics of phyllostomid bats with Robert Baker. Calvin adds important leadership to the lab.

Brenda Rodgers has recently completed her Ph.D, graduating in December 2000. Her dissertation, entitled "Cytogenetic effects of exposure to Chornobyl radiation", resulted in four manuscripts on which she is first author. One, examining micronuclei frequencies in *Clethrionomys glareolus* from Chornobyl, has been published in *Environmental Toxicology and Chemistry (ET&C)*. A second, examining radioresistance in *C. glareolus* from Chornobyl is in press, and a third, examining micronucleus frequencies in laboratory strains of *Mus* exposed to the Chornobyl environment, have been submitted to *ET&C*. The fourth manuscript on the human health effects of exposure to Chornobyl radiation is currently in preparation for submission to *Health Physics*. Presently, she is jointly appointed as a postdoctoral research associate with Robert Baker and Laura K. Baker, M.D., and will continue to study the effects of low-dose radiation exposure in humans and in animal model systems. brodgers@ttacs.ttu.edu

Graduate Students and their research:

Emma Mae Pamela Dawson is a Masters student from Belize in the Museum Science program. Her thesis research is entitled "Collection Documentation: Creating a Relational Database for the National Museum of Belize." edawson@packrat.musm.ttu.edu

Amy Halter is working on a Master's degree in Museum Science. Her thesis interest is in developing standards for the management of recent mammal collections. Amy is a major positive force in taking care our mammal collection. amy.halter@ttu.edu

Michelle L. Haynie is a first year Ph.D. student. Michelle completed her Master's degree, thesis entitled "Parentage, multiple paternity, and reproductive success: using microsatellites to study social interactions in two species of prairie dogs", at Oklahoma State University under the direction of Dr. Ron Van Den Bussche. Her current research at Tech involves the application of Representational Differential Analysis (RDA) to questions pertaining to the presence of unique sequences among a species and subspecies of prairie chicken (*Tympanuchus*). This project is in collaboration with Dr. Phil Sudman at Tarleton State University. She also is involved in a study of *Clethrionomys* from Chornobyl using microsatellites to detect the presence of mutations and the possibility of multiple

paternity using known mother-embryo sets. Michelle is also assisting on a microsatellite study of wolves (*Canis*). mhaynie@ttacs.ttu.edu

Federico G. Hoffmann is from Uruguay where he was a student of Enrique Lesse's. Federico is a second year Ph.D. student in systematics at Texas Tech. As part of the program's studies on systematics of phyllostomid bats, Federico has sequenced the *cyt b* gene from *Uroderma*, *Glossophaga*, and *Carollia*. His studies on *Uroderma* involve a definition of the chromosomal contact zone based on the distribution of sequence variation. fhoffman@ttacs.ttu.edu

Rex McAliley is the newest member of our Ph.D. program. Rex has just completed his thesis work with Phil Sudman at Tarleton State comparing molecular variability among populations of *Geomys texensis* and investigating the occurrence of *G. texensis* mtDNA in a *G. bursarius* population.

Mark B. O' Neill is employed by Lexicon Genetics in Woodlands, Texas. He continues his Master's work using mtDNA sequence data to estimate the genetic distinctiveness of water shrews (*Sorex*) on Vancouver Island, British Columbia from mainland populations. In addition, Mark is examining the cytochrome b gene in the desert shrew (*Notiosorex*).

Deidre Parish is beginning the third year of her Ph.D. program. Her work involves *in situ* hybridization and her main focus is the studies of LINE elements in *Sigmodon*, *Peromyscus*, and Phyllostomids. She has contributed to the study of the genomic distribution of DNA fragments isolated by Representational Difference Analysis (RDA) in 4 species of *Microtus* from the Chernobyl fauna. Currently, she is collaborating with Holly Wichman from the University of Idaho studying the role of LINE element accumulation in X-chromosome inactivation in a variety of genera that exhibit sex chromosome abnormalities. The ultimate goal is to understand the forces that contain parasitic DNA in the genome. dparish@ttacs.ttu.edu

Anastasiya Pocheptsova is from Ukraine. She is a Masters student in Mass Communications who is developing the Chernobyl home page. The home page is unique in that the information is presented in English, Russian, and Ukrainian. The address is www.nsrll.ttu.edu/chernobyl/.

Marcy Revelez is a second year Ph.D. student. Marcy completed her master's degree on pocket gophers (*Geomys*) at Angelo State University under the direction of Dr. Robert Dowler. Her research project at Tech is yet to be determined, but probably will involve chromosomes and their use in systematics. She is exploring the use of pseudo-G-bands generated from computer image analysis systems. She also continues to have an interest in the research project on the Galapagos Islands led by Dr. Dowler. She has a strong interest in museum collections and museum science. mrevelez@ttacs.ttu.edu

Jeffrey K. Wickliffe is in the third year of his Ph.D. program and is currently investigating possible genetic effects in native rodents and environmentally enclosed *Mus* exposed to ionizing radiation in the Chernobyl region (Ukraine). We are estimating mtDNA heteroplasmy as a biomarker of genotoxic effect. In addition, we have enclosed transgenic Big Blue mice (C57BL/6) in the Red Forest region to estimate potential somatic mutation frequencies. We plan to expose C57BL/6 and BALB/c strains of *Mus* to the Chernobyl environment for 160 days. We will allow these strains to cross repeatedly and investigate minisatellite germline mutation rates in the offspring. We are continuing our investigations into the systematics and molecular evolution of *Apodemus agrarius*, *A. sylvaticus*, and *A. flavicollis* from Ukraine and South Korea using the androgen binding protein (α subunit). Jeff is also examining cytochrome b variation in *Thomomys* from Texas. Jeff.Wickliffe@ttu.edu

Undergraduate Students and Their Research:

Amy Bickham is a junior at Texas Tech. Her research project is studying the haplotype frequencies in *C. glareolus* from highly contaminated regions at Chernobyl as compared to sites that are relatively pristine. Her work also addresses temporal changes in haplotype frequencies. This is an extension of Cole Matson's masters work.

Gladys Rivera-Kennel is a junior at Texas Tech. She is presently assisting in the prairie chicken studies conducted by Michelle Haynie.

Additional Information from Recent Graduates:

Kelly Allen is now an Assistant Professor in the Department of Natural Resources, Central Oregon Community College, Bend, Oregon. *kellyallen@usa.net*

Nicole Lewis-Oritt is teaching Biology at Chico State University, Chico, California. *nlewisor@netscape.net*

Reagan King finished her Masters degree in December 2000 and her thesis, "Electronic field data capture using Wildcat III", is published in *Museology* 9:1-8, October 2000. *raegan@packrat.musm.ttu.edu*

**TEXAS TECH UNIVERSITY
Department Of Biological Sciences
Lubbock, TX 79409-3131**

Ronald K. Chesser

PHONE: (806) 742-1737

FAX: (806) 742-2963

EMAIL: rchesser@ttu.edu

WEB PAGE ADDRESS: www.nsrl.ttu.edu/chernobyl/

Research Interests, Projects and Grants:

- 1) Biological and genetic impacts of the Chernobyl Nuclear Accident. Modeling the absorbed radiation dose from internally deposited radionuclides in non-human species, mapping the distribution of radionuclides in regions surrounding the Chernobyl Reactor Complex, genetic responses of animals exposed to environmental radiation.
- 2) Use of biological informatics in the assessment of contaminated environments. Application of GIS and biological/genetical information to evaluating patterns of movements, demographic and reproduction in affected organisms. Combining geographic and temporal patterns for accurate risk assessment and design of remediation efforts.
- 3) Modeling spatial and temporal dynamics of gene diversity in socially structured populations. Determining the evolutionary value of mating and dispersal tactics and the resultant patterns of genetic variance partitioning in animal populations. Calculation of effective population size and the ultimate rates of change of genetic diversity.

**The MUSEUM of TEXAS TECH UNIVERSITY
Box 43191
Fourth Street and Indiana Ave.
Lubbock, TX 79409**

Clyde Jones

PHONE: (806) 742-2487

FAX: (806) 742-0362

EMAIL: cjones@packrat.musm.ttu.edu

WEB PAGE ADDRESS: www.nsrl.ttu.edu

Research Interests, Projects and Grants: Mammals of the Chihuahuan Desert, with especial emphasis on mammals of the Trans-Pecos area of Texas and adjacent regions.

Graduate Students and Their Research:

Joel Brant - Mammals of sandhills regions of Texas and adjacent areas
 Robert DeBaca - Recent mammals of the Davis Mountains, Texas
 Jana Higginbotham - Bat communities of the Trans-pecos region and adjacent areas

TEXAS TECH UNIVERSITY
Department of Biological Sciences
Lubbock, TX 79409-3131

Robert D. Owen

Office Phone: 806-742-3232

Laboratory Phone (Graduate Students): 806-742-3039

FAX: 806-742-2963

Email: robert.owen@ttu.edu

Research Interests, Projects and Grants:

Mammalian systematics, zoogeography and evolution, with emphasis on Neotropical fauna.
 Multivariate statistical methods in systematics and evolution.
 Philosophy and methodology of vertebrate phylogenetics.
 Systematics and biogeography of small mammals in the western Transverse Volcanic Belt region of México.
 Systematics, biogeography, ecology and conservation of Paraguayan mammals.
 During spring and summer 2001, Dr. Owen will be in Paraguay on a Fulbright Fellowship, working in the Universidad Nacional de Asunción to establish a Master's degree program in Biology.

Graduate Students and Their Research:

Brian Amman is in the second year of his Ph.D. program. His research is focused on the morphological and molecular systematics of the Neotropical frugivorous bat genus *Platyrrhinus*. Email: bamman@ttu.edu

Carl W. Dick is in the second year of his Ph.D. program. His research is centered on the systematics of New World streblid batflies and coevolution with their chiropteran hosts. He is also investigating the evolutionary ecology of the coexistence of multiple parasite species. Email: cdick@ttu.edu

George Wang has nearly completed his M.S. degree. His project is entitled "Ecological characterization of bat species distributions in Michoacán, México, using a Geographic Information System." Email: george.wang@ttu.edu

Jacy Lewis is in the first year of her M.S. degree. She is interested in the application of models to biological systems. Email: comeonissuchajoy@yahoo.com

TEXAS TECH UNIVERSITY
Department Of Biological Sciences
Lubbock, TX 79409-3131

Carleton J. Phillips

PHONE: (806) 742-2715

FAX: (806) 742-2963

E-MAIL: carl.phillips@ttu.edu

WEB PAGE (with complete CV): <http://www.biology.ttu.edu>

Current Research Interests, Projects, and Grants: My main personal interest is in molecular and cellular evolution of mammals. I pursue this interest in several ways, including interspecific comparisons of mammalian salivary gland ultrastructure (using ecological and evolutionary frameworks). I am also currently investigating the molecular evolution of salivary pheromones in rodents. One pheromone in particular, an androgen-binding protein, appears to have a key role in mate-selection. Additionally, I presently am co-PI on a sponsored project to study the role of small mammals in the distribution and prevalence of leptospirosis in Texas. Biogeography of bats in the Caribbean, landscape ecology and biogeographic history of mammals of Patagonia, population genetics of small mammals, and cellular responses to chronic radiation exposure at Chernobyl are other active interests of mine. Forthcoming projects include participation in the Texas Tech mammalogy field expeditions being planned for 2001 and 2002, additional fieldwork at Chernobyl, and a project in collaboration with scientists at the National Institute of Molecular Biology, Okazaki, Japan. Details on past field experience, research, and published articles are available in my CV, accessible through my web page.

Funded Research Associate: Jeffrey K. Wickliffe is my Research Associate. His primary work with me is on salivary pheromones in rodents.

Graduate Students and their research: I currently serve on the committees of three Ph.D. candidates, Frederico J. Hoffman (R. J. Baker, Advisor) who is interested in bat systematics and population genetics, Robert S. DeBacca (Clyde Jones, Advisor) who studies mammals in the Trans-Pecos, and Heather Roberts (Marilyn Houck, Advisor) who is completing her dissertation on molecular co-evolution of prairie dogs and their fleas. I also am co-Advisor (with Clyde Jones) for the following students.

Joel Brandt is another new Ph.D. student in mammalogy at Texas Tech. As with Jana, Joel's dissertation research is just now taking shape and will certainly involve GIS and plenty of hands-on field work

Jana Higginbotham is a new Ph.D. student in mammalogy at Texas Tech. Although she has not settled on exactly what her dissertation research will be, it seems likely that she will use a combination of methods (including GIS and Biological Informatics) to explore factors that affect distribution of small mammals in the landscapes of southwestern Texas.

TEXAS TECH UNIVERSITY
Office of the President
Mail Stop 2005
Lubbock, TX 79409-2005

David J. Schmidly

PHONE: (806) 742-2121

FAX: (806) 742-2138

EMAIL: david.schmidly@ttu.edu

WEB PAGE: www.ttu.edu/

Research Interests, Projects, and Grants: Natural history, systematics, and conservation of Texas mammals. Current projects include: Mammals of Texas revision, authoring Natural History of Texas: A Century of Change, the Nature Conservancy's biological survey of Texas, and Texas Parks and Wildlife for the 21st Century grant.

Graduate Students and Their Research:

Chris Hice is a Ph.D. candidate. Her dissertation research involves the ecology of small mammal communities in neotropical lowland habitats. She is interested in the impacts of habitat and disturbance on these communities. She has received numerous awards and grants for her research, including the Wilk's Award, the Achievement Reward for College Scientists, and a recent NIH grant.
chhice@ttacs.ttu.edu

TEXAS PARKS AND WILDLIFE DEPARTMENT
Wildlife Diversity Program
3000 IH-35 South, Suite 100
Austin, TX 78704

Paul B. Robertson

PHONE: 512-912-7044

FAX: 512-912-7058

EMAIL: paul.robertsonf@tpwd.state.tx.us

Research Interests, Projects and Grants: Mountain lion conservation & management; prairie dog conservation & management; ecology & management of meso-carnivores.

TEXAS WESLEYAN UNIVERSITY
Department of Biology
1201 Wesleyan University
Fort Worth, TX 76105

Michael Dixon

PHONE: 817-531-4895

FAX: 817-531-4202

EMAIL: dixonm@txwes.edu

WEB PAGE ADDRESS: <http://www.txwesleyan.edu/biology/index.html>

Research Interests, Projects and Grants: Natural history of the bats of Big Bend especially *Lasiurus xanthinus*

Undergraduate Students and Their Research:

Roger Rodriguez --Intra- and interspecific sequence variation in mitochondrial D-loop of *Myotis californicus* and *M. ciliolabrum*.

TRINITY UNIVERSITY
Department of Biology
715 Stadium Drive
San Antonio, TX 78212

David O. Ribble

PHONE: 210-999-8363

FAX: 210-999-7229

EMAIL: dribble@trinity.edu

WEB PAGE ADDRESS: <http://www.trinity.edu/dribble>

Research Interests, Projects and Grants: I am interested in the ecology and evolution of mating systems in mammals, and work primarily on *Peromyscus*. Recently I have started work on the ecology and evolution of monogamy in African elephant-shrews (Macroscelidea). I also work with Trinity undergraduates on the ecology, natural history, distribution, and conservation of mammals in Bexar County. We are currently focusing on the mammals of Government Canyon State Natural Area.

Undergraduate Students and Their Research:

Nicholas Farmer. Group recognition and behavior in Texas shiners.
Carol Micek. Paternity estimation in *Peromyscus* using microsatellites.

UNIVERSITY OF NORTH TEXAS
Department of Biological Sciences
Denton, TX 76203

Earl G. Zimmerman

PHONE: (940) 565-3590

FAX: (940) 565-3821

EMAIL: ezim@unt.edu

WEB PAGE ADDRESS: www.cas.unt.edu/~ezim

Research Interests, Projects and Grants: Applications of remote sensing and geographic information systems to studies of biodiversity; mitochondrial DNA sequence analysis applied to populations and systematics; investigations of genetic variation in mammal populations, including the relationship of genic variation to environmental, demographic and biogeographic parameters; population genetics and multivariate statistical treatment of genetic data; genetics and management of threatened or endangered populations.

Graduate Students and Their Research:

Dyke, Bethany. M.S. Applications of GIS to animal species of epidemiological concern in Texas.
Carr, Carla. PhD Applications of GIS and sequence analysis to mammalian biogeography on the Colorado Plateau
Miller, Christopher. M.S. Applications of remote sensing and GIS to habitat modeling of the Rio Grande Turkey in north central Texas

Additional Information: Jackson, Victoria PhD Applications of remote sensing and GIS to habitat modeling and conservation of ocelots in Texas.

The Department of Biological Sciences at UNT offers MS and PhD degrees in biology, environmental science, molecular biology, and biochemistry. With nearly 1,000 UG majors and 200 graduate students, our program is the largest and most comprehensive in north-central Texas. Funding for research in Biological Sciences comes from a variety of federal, state, local, and private organizations and offers opportunities to conduct research in a variety of field and laboratory settings. The university has scholarships available for applicants to the graduate school to begin their studies in spring 2001.

UNIVERSITY OF TEXAS AT ARLINGTON
Department of Biology
Box 19498
Arlington, TX 76019

Loren K. Ammerman

PHONE: (817) 272-5731

FAX: (817) 272-2855

EMAIL: loren@uta.edu

WEB PAGE ADDRESS: <http://www.uta.edu/biology/ammerman/>

Research Interests, Projects and Grants: I am interested in the evolutionary relationships of vertebrates. I am also interested in the community structure and roosting/feeding ecology of bats.

Graduate Students and Their Research:

Mandy Matthews - Trophic partitioning in two species of morphologically-similar free-tailed bat species (*Tadarida brasiliensis* and *Nyctinomops femorosaccus*) in Big Bend National Park.
 Roger Rodriguez - Genetic variation within *Myotis ciliolabrum* and *Myotis californicus*.

Undergraduate Students and Their Research:

Jeff Morrison - Patterns and trends in nightly activity of the bats of Big Bend National Park.

Additional Information: I will be offering a course entitled "Natural History of Bats" over the Maymester in 2001 at the University of Texas at Arlington. See <http://www.uta.edu/biology/ammerman/Bats/NatHistBats.html> for more information.

302 North Strickland Street
Eagle Lake, Texas 77434-1841

Rollin H. Baker

PHONE: (979) 234-2027

EMAIL: rbaker@elc.net

Research Interests, Projects, and Grants: Mammalogy – Texas in particular currently. See essays on Texas mammals in this newsletter.