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Mammalian Diversification
From Chromosomes to Phylogeography
(A Celebration of the
Career of James L. Patton)

Edited by Eileen A. Lacey and Philip Myers

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Patton)

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Abstract

James L. Patton served as Curator of Mammals in the Museum of Vertebrate Zoology (MVZ) and as Professor of Integrative Biology (formerly Zoology) at the University of California, Berkeley, from January, 1969 until June, 2001. During his 32 years as a curator and a member of the Berkeley faculty, Jim made an indelible mark on vertebrate evolutionary biology through his tireless pursuit of excellence in research and teaching. In addition to significantly advancing studies of mammalian evolutionary genetics, systematics, and phylogeography, Jim was instrumental in shaping the careers of vertebrate biologists throughout the Americas. Given the magnitude of his impact on studies of mammals, it seemed only appropriate to celebrate Jim's retirement from the Berkeley faculty by compiling a volume that reflects the breadth of his contributions to vertebrate biology. At the same time, everyone involved in the project agreed that the volume should capture something of Jim, the person. As those of us who have had the privilege of working with him know, Jim is an enthusiastic, generous, no-nonsense individual who doesn't hesitate to support his students and colleagues in any way that he can. Thus, while Jim's intellect and work ethic have made him a successful scientist, it is his personality that has endeared him to so many of his students and colleagues. Here, we try to capture both elements of Jim's career. The result is a series of rigorous, original research papers combined with more informal recollections of Jim's activities as a scholar, mentor, and museum curator. For those readers who have not had the opportunity to interact with Jim, we hope that the following pages will bring to life both the distinguished career and the distinctive personality of this highly respected evolutionary biologist.

**MAMMALIAN DIVERSIFICATION:
FROM CHROMOSOMES TO
PHYLOGEOGRAPHY**

(A Celebration of the Career of James L. Patton)

For Jim and Carol, with many thanks

Mammalian Diversification: From Chromosomes to Phylogeography

(A Celebration of the Career of James L. Patton)

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James L. Patton served as Curator of Mammals in the Museum of Vertebrate Zoology (MVZ) and as Professor of Integrative Biology (formerly Zoology) at the University of California, Berkeley, from January, 1969 until June, 2001. During his 32 years as a curator and a member of the Berkeley faculty, Jim made an indelible mark on vertebrate evolutionary biology through his tireless pursuit of excellence in research and teaching. In addition to significantly advancing studies of mammalian evolutionary genetics, systematics, and phylogeography, Jim was instrumental in shaping the careers of vertebrate biologists throughout the Americas. Given the magnitude of his impact on studies of mammals, it seemed only appropriate to celebrate Jim's retirement from the Berkeley faculty by compiling a volume that reflects the breadth of his contributions to vertebrate biology. At the same time, everyone involved in the project agreed that the volume should capture something of Jim, the person. As those of us who have had the privilege of working with him know, Jim is an enthusiastic, generous, no-nonsense individual who doesn't hesitate to support his students and colleagues in any way that he can. Thus, while Jim's intellect and work ethic have made him a successful scientist, it is his personality that has endeared him to so many of his students and colleagues. Here, we try to capture both elements of Jim's career. The result is a series of rigorous, original research papers combined with more informal recollections of Jim's activities as a scholar, mentor, and museum curator. For those readers who have not had the opportunity to interact with Jim, we hope that the following pages will bring to life both the distinguished career and the distinctive personality of this highly respected evolutionary biologist.

As a starting point for this undertaking, we begin with a brief history of the events leading to the production of this volume. The idea of celebrating Jim's long and productive career originated with several of his former graduate students, notably Márcia Lara, Yuri Leite, and Leonora Costa, all of whom had worked with Jim during his extensive studies of the phylogeography of Amazonian mammals. Knowing that he was likely to object to any type of "fuss" on his behalf, Jim was not informed that a celebration was in the works until plans for the event were well underway. Originally envisioned as a small, informal get-together intended to coincide with Jim's retirement from the Berkeley faculty, "Pattonfest" quickly grew into a three-day affair that included oral and poster presentations of original research, a banquet, and the premiere of a video tribute to Jim compiled by Alison Chubb, then a graduate student in the MVZ. In the end, more than 120 of Jim's colleagues (many of whom were former students and postdoctoral scholars)

attended the event, which was held 22-24 June, 2001, in the Valley Life Sciences Building on the UC Berkeley campus.

One outgrowth of Pattonfest was the decision to prepare a volume of original research papers authored by individuals who have worked with Jim as students, colleagues, or both. During the planning stages of this endeavor, we (Eileen Lacey and Philip Myers) were enlisted to see the project to fruition by serving as editors of the volume. Needless to say, this would not have been possible without the help of numerous individuals, beginning with the "Shipwreck Committee" - the band of students (most of whom have now fled to other countries) who conceived of, organized, and executed Pattonfest with great care and skill. In particular, we thank Yuri Leite, Leonora Costa, Maria Soares, and Diogo Meyer for putting together an excellent party. Carol Patton was a willing co-conspirator who helped tremendously by making sure that Jim was not off in the field during the big weekend. The faculty and staff of the MVZ - in particular Craig Moritz and Annie Caulfield - provided considerable assistance with the logistic and financial aspects of the celebration. The event itself would not have been such a success without the participation of the many individuals who traveled to Berkeley to help celebrate Jim's career. With regard to the preparation of this volume, we thank the contributors, each of whom was willing to share the results of their work in this format. Javier Rodríguez-Robles acted as an informal third editor, offering excellent advice on numerous points during preparation of the volume. Karen Klitz provided invaluable assistance with the preparation of the tables and figures. Mary Beth Rew, Julie Woodruff, and John Wieczorek contributed to the formatting of the volume. For guidance during preparation of the manuscript, we thank John Lynch, Michelle Echenique, and Charles Crumly of the University of California Press. And, finally, thanks (of course) to Jim for simply being himself.

Part I: North America and the Origins of a “Curator’s Curator”

James L. Patton began his career at the University of California, Berkeley, in January of 1969. Jim’s position at Berkeley consisted of a 50% appointment in the Department of Zoology (now the Department of Integrative Biology) and a 50% appointment in the Museum of Vertebrate Zoology (MVZ). Although officially Jim’s responsibilities as a faculty member were equally divided between these units, it was the Museum that quickly became the focal point of his professional activities. Initially, Jim had little formal experience with museum curation – it was his expertise in mammalian cytogenetics that had attracted the attention of MVZ Director Oliver Pearson, leading to the offer of a faculty position. Following his appointment, Jim immersed himself so thoroughly in all aspects of the MVZ and its collections that, at the time of his retirement, he was generally regarded as one of the world’s leading curators of mammal specimens.

Jim has made numerous fundamental contributions to museum-based studies of mammalian evolution. To date, he has deposited nearly 20,000 specimens in the MVZ, making him the most prolific collector of mammal specimens in that institution’s nearly 100-year history. These specimens have formed the core of his research program, which has generated more than 140 publications, most of which are peer-reviewed contributions to leading professional journals. While Jim embodies the rugged field ethic, enthusiasm for collecting, and broad knowledge of organismal biology traditionally associated with curators of natural history museums, he is also an innovator who does not hesitate to try new technologies if they will improve the quality of his research or the efficiency of his curatorial activities. To this end, Jim was instrumental in establishing facilities for modern molecular genetic research in the MVZ and he was an early proponent of electronic museum data storage, including the development of the Mammal Networked Information System (MaNIS), an internet-accessible network of specimen data from 17 mammal collections in North America. Jim’s absolute commitment to natural history research and his intellectual as well as practical contributions to the MVZ have been instrumental in maintaining the international prestige of this institution. The quality and impact of his work with mammal collections have led to Jim’s colleagues to refer to him as a “Curator’s Curator.”

A key component of Jim’s ontogeny as a curator was his comprehensive analysis of the evolutionary genetics of pocket gophers (Rodentia: Geomyidae: *Thomomys*), which contributed more than 6,600 specimens to the MVZ’s mammal collection. This now-classic work, which marked the first phase of Jim’s career at Berkeley, resulted in a substantial revision of geomyid systematics and produced

significant new insights into the processes underlying the diversification of vertebrate populations. It also established Jim as an expert on the small mammal fauna of western North America. In recognition of this work and the geographic focus of Jim's early research, the first section of this volume focuses on studies of North American mammals.

The volume opens with a biographical sketch of James L. Patton by Javier Rodríguez-Robles and Harry Greene. This is an informal overview of Jim's life that summarizes his numerous professional accomplishments while at the same time providing insights into the personality underlying these achievements. For those readers who know Jim, many of the quotes contained in the paper will be immediately recognizable. For those who have not had the opportunity to interact with him, this contribution serves to bring to life this highly accomplished researcher who, when asked to characterize his career, tends to respond that he is "just a rat trapper." As Rodríguez-Robles and Greene reveal, there is considerably more to Jim Patton than his ability to catch rats, although, as his collecting record indicates, capturing rodents is something at which he excels.

The second paper in the volume uses recent ecological changes in the San Joaquin Valley of California to explore the role of natural history collections in the preservation of vertebrate biodiversity. A central theme of this contribution by Patrick Kelly and colleagues is the philosophy for natural history research outlined by Joseph Grinnell, the first Director of the Museum of Vertebrate Zoology (1908-1939). Grinnell's prescient writings regarding the importance of collections to conservation biology have significantly influenced many researchers affiliated with the MVZ, including Jim Patton. As Kelly and his co-authors indicate, the need for collections-based research continues and, indeed, the value of existing collections is growing as new technologies increase the ways in which specimens can be used to understand threatened faunal assemblages. Thus, the paper by Kelly et al. provides critical insights into the historical legacy of Jim's position as Curator of Mammals, as well as the role that his contributions to the MVZ are likely to play in future efforts to protect California's vertebrate fauna.

The third paper in this section, co-authored by Hopi Hoekstra and Michael Nachman, uses state of the art genetic technology to explore an old problem in mammalian natural history – the evolution of pelage color variation among the pocket mice (genus *Chaetodipus*) of the southwestern United States. As first reported in the 1920's and 1930's, conspecific pocket mice living on light sand versus dark volcanic substrates differ phenotypically by displaying, respectively, light and dark pelage. By examining specimens from different substrates, Hoekstra and Nachman identify the genes associated with variation in coat color in these animals. Their work represents an important effort to link phenotypic differences to underlying patterns of genotypic variation and their data yield some surprising results regarding the multiplicity of ways in which selection can act to resolve a single adaptive challenge. The authors' use of molecular technology to address a

fundamental question in mammalian biology mirrors the integration of organismal and genetic research that has characterized much of Jim Patton's career.

The final contribution in this section examines the effects of large-scale environmental changes on the distribution of mice in Michigan. Using a naturally occurring contact zone between white-footed mice (*Peromyscus leucopus*) and deer mice (*P. maniculatus*), Philip Myers and his co-authors relate changes in the relative abundance and geographic distribution of these species to annual variation in environmental conditions. The authors' synthesis of field observations and museum records parallels the integration of modern and historical data outlined by Kelly et al. and underscores the critical contributions that collections-based researchers such as Jim Patton are making to efforts to understand faunal change. Myers and his colleagues report a striking decline in deer mice in northern Michigan that provides sobering evidence of the potential effects of environmental perturbations - including human-induced climate changes - on future mammalian diversity.

Genes, Rats, and Sinking Boats: A Biographical Perspective on James L. Patton

Javier A. Rodríguez-Robles and Harry W. Greene

“Every naturalist of great worth has had his own combination of ways by which he has influenced his science and his associates in it.”

Alden H. Miller (1964: 235)

Every scientific discipline has a few practitioners whose influence is pervasive and long-lasting. In the case of cytogenetics, systematics, mammalogy, and phylogeography, James Lloyd Patton has been one of those individuals. Accordingly, a brief biography of “Jim” seems in order as an introduction to this volume, which celebrates Jim’s career as Professor of Integrative Biology and Curator of Mammals at the Museum of Vertebrate Zoology, at the University of California, Berkeley. We quickly recognized that this account would be much more true to Jim’s impact on biology if it revealed something about the lesser-known aspects of his life, rather than just chronicling the most salient features of his distinguished career. That two authors at markedly different stages of their careers (J.A.R.-R. is an assistant professor; H.W.G., a senior faculty member) and who are herpetologists were invited to profile someone widely recognized as the foremost mammalian systematist of his generation may seem peculiar. But, to us, this merely supports our contention that Jim’s influence is far-reaching, and that he has been, and continues to be, a role model to junior and senior researchers from diverse organismal disciplines. When Jim learned that we were writing this synopsis, he exclaimed, in his characteristically unpretentious, but candid way, “Why are you wasting your time? Don’t you have anything better to do?” Our answer to the latter question was – and still is – a categorical “No.” What better way to salute a great scholar, personal hero, and dear friend? Despite his uneasiness, Jim agreed to be interviewed (by J.A.R.-R.) for this account, and what follows is based largely on that three-hour conversation that took place on the morning of December 7, 2001 at Jim’s office in the Museum of Vertebrate Zoology.

THE ADVENTURES OF THE YOUNG JIM PATTON

Jim was born in Saint Louis, Missouri, on June 21, 1941. His father, John Franklin Patton II, was an urologist, and his mother, Marjorie Allyn Marquardt, a homemaker. Jim’s father was in the United States Army Reserve, but his hospital unit was called into active duty during World War II, and he served in Africa and

Europe. After the war ended, he went back into civilian life, but during the Korean War took a regular Army commission. He retired as Chief of Surgery at Walter Reed Army Medical Center in Washington, D.C. in 1963 (Layne and Hoffmann, 1994). As a result of his father's career, Jim, the younger of two brothers (John Franklin III is senior by two and a half years), spent many of his early years as an "army brat" at military bases in the United States (Denver, Colorado and Washington, D.C.) and Landstuhl, Germany. Jim credits his father with instilling in him a canon by which he has lived, namely "whatever you do, do it right, and have fun doing it." He also gave Jim complete freedom to pursue his own professional interests.

Growing up in Saint Louis in the 1940's, Jim was destined to be a baseball fan. Initially, he favored the Saint Louis Browns (now the Baltimore Orioles), perhaps because at a church function he won a baseball that had been autographed by Bill Veeck, the Browns's colorful owner. However, when Martina Marion – daughter of the great Cardinals shortstop Marty "Hands" Marion – ended up in Jim's third grade class, he immediately became a Cardinals (and a Martina) fan. Another one of Jim's close friends was "Dicky" Musial, son of Cardinals outfielder Stan "The Man" Musial. Because of his friendship with Martina and Dicky, Jim often went to Cardinals games, where he and his friends collected player's autographs. Even though the Patton family moved from Saint Louis in 1952, to this day Jim remains a loyal Cardinals enthusiast.

"Jimmy," as he was known to his family, was a "good kid" who rarely got into trouble or did anything to upset his parents. His relationship with his brother John was a little less tranquil. Their interactions took a contentious turn in 1947 that lasted ten years. For his sixth birthday, Jim had received some toy lead soldiers, and he and his brother were playing with them by the creek behind their house. At one point John demanded that Jim give him one of the soldiers. When Jim refused, John picked up a rock, threw it at Jim and hit him on the head, causing an injury that bled profusely. This incident marked the beginning of a period of intense sibling rivalry that did not end until 1957, when John stayed in Germany to finish his senior High School year. When he reunited with his family in Washington, D.C. five months later, John and Jim suddenly became best of friends, and have been very close ever since.

Jim was always a good student. In high school in Maryland, he was a member of the National Honor Society, and received an honorable mention as a competitor for a National Merit Scholarship. He was well liked by his classmates, and was voted class president in his sophomore year.

Jim is a very shy person. He believes that the event that most helped him to overcome this tendency was his father's return to the military towards the end of the Korean War. That decision forced the family to live in various parts of the world, to meet new people on a regular basis, and to become immersed in different sets of circumstances.

With Jim, the adage “what you see is what you get” has always applied. Since childhood, he has *always* told it like it is, or at least like *he thinks* it is. Jim was very independent as a kid and seemed to know when he was correct and was not afraid to say so, qualities that he acquired from his father. He was also focused, and once he committed to something, he worked tirelessly to complete it, traits that undoubtedly helped him to attain so many remarkable achievements in his academic career. Indeed, Jim claims that his best quality is his perseverance.

The seeds of many of Jim’s most salient personal characteristics were evident early on. He has always been very good with his hands and enjoys working with them. Wherever his family lived, Jim usually set up a workshop in his bedroom with an assortment of tools and paints, and he built model trains, cars, and planes. In high school in Germany, he built a wooden box designed specifically for surgical instruments, complete with drawers and individual compartments for each. During his first years as an Assistant Professor at U.C. Berkeley, he built wooden furniture for his home and for the laboratories at the Museum of Vertebrate Zoology. Jim’s manual dexterity is patently visible in the thousands of perfect study specimens that he has prepared.

Jim’s propensity towards museum curation was also apparent as a child. In Saint Louis, the Pattons lived in a rural area and Jim and his brother spent virtually all their waking hours outdoors. Jim collected fossils, Indian arrowheads, and other artifacts that he found in woods and fields around his house. With a friend, he put the objects on display and invited neighbors to visit their “museum,” where the two would talk about the history of their collections. Accordingly, Jim became very interested in archeology and anthropology, read extensively on these subjects throughout junior high and high school, and decided to become a professional anthropologist.

LIFE AS AN ARIZONA WILDCAT

Jim applied to only two colleges - the University of Arizona, Tucson (U of A) and the University of New Mexico, Albuquerque - which represented the two most prestigious anthropology programs in the nation at that time. He was accepted at both institutions and chose to attend the former. Thus, in fall 1959 Jim became an undergraduate anthropology major at U of A.

During his freshman year, Jim took Introductory Anthropology, taught by Frederick S. Hulse. Jim did very well in the class, and Hulse exhorted him to get involved in the department. As a junior and senior Jim took several graduate seminars from Hulse and, as a senior, undertook a research problem (i.e., an undergraduate Honors Thesis) that Hulse supervised. Hulse encouraged Jim to go to graduate school and at least obtain a Master’s degree in Anthropology from U of A. During his senior year, Jim took a required two-semester course in scientific illustration that taught students how to draw publication-quality maps and

illustrations and take scientific photographs. Since childhood, he had liked drawing, and he thoroughly enjoyed the class and did well in it. When he went to graduate school the following semester, there were few available scholarships, and for his first year he was offered a teaching assistantship in the Scientific Illustration course. Don E. Wilson, now a senior mammalogist at the National Museum of Natural History in Washington, D.C., was in that class and recalls that "Jim was a patient and willing teacher even then, presaging his long and productive career as an educator."

In 1963 Jim received a Bachelor's of Arts degree in Anthropology (with distinction), and he began his graduate studies at U of A that fall. His ability as a draftsman proved extremely valuable, and he supported himself through his first summer in graduate school by working as a scientific illustrator. The textbook *Zoology*, by Cockrum and McCauley (1965), contains many of Jim's drawings, and McCauley referred to Jim as "the master of the fine line technique." As a graduate student, Jim continued earning money by drafting illustrations, including those of the type series of a subspecies of plethodontid salamander (Lowe et al., 1968). Not surprisingly, to this day, Jim draws virtually every illustration and takes all of the specimen photographs for his numerous publications.

In the fall semester of his second year in graduate school, Jim completed a substantial portion of his Master's thesis in Physical Anthropology. At that time he decided that "physical anthropologists ought to know more about mammals other than primates" and, after receiving special permission from his department, he enrolled that spring in E. Lendell Cockrum's Mammalogy course and William B. Heed's course in Human Genetics in the Zoology Department. The Mammalogy laboratory introduced students to mammals of the world, and Jim was fascinated by their diversity. In the second week of class, Alfred L. "Al" Gardner, a graduate student of Cockrum's and already a professional collector, invited Jim to accompany him to trap rodents on the Santa Rita Experimental Range, located approximately 56 km south of Tucson. Jim happily accepted, and went out on a Friday night to set traps for the first time. The Tucson area has an enormous diversity of small mammals and the first trap they checked the next day had a kangaroo rat (*Dipodomys* sp.) in it. Jim recalls that he was "floored by that animal, which [he] had never seen before, and floored by the diversity that [he] saw, and it just really piqued [his] interest."

That semester, Jim had to conduct a laboratory project in his Human Genetics course. One day, Heed walked into the laboratory and challenged his students to develop a technique that would allow a researcher to screen routinely the mitotic chromosomes of any animal. Jim accepted the challenge. Because he was taking Mammalogy concurrently, he decided to use small rodents as his study organisms, and, by the end of the semester, had succeeded in developing such a procedure.

The article that resulted from his work (Patton, 1967b) has since been designated a Science Citation Classic.¹

Jim immediately realized that his newly developed protocol for chromosome analysis would give him “a window to look at critters in ways that nobody had ever been able to look at them before.” In other words, he now could study “all those little furry creatures running around out there and their possible karyotypes.” Physical anthropology no longer elicited this same kind of excitement from Jim. In fact, he was somewhat disenchanted with the state of the discipline at the time, and decided to switch fields. Hulse was very supportive, and advised Jim to transfer to the Zoology Department to pursue his newly-developed interest in genetics. Heed was equally encouraging and, although he did not know much about mammals or mammalian cytogenetics (his research focused on chromosome evolution in natural populations of *Drosophila* [desert fruit flies]), he invited Jim to join his laboratory and offered him a research assistantship. Although the assistantship required Jim to conduct research on chromosomal inversion polymorphisms in *Drosophila* (Patton and Heed, 1965), it provided him the opportunity to work in mammalian cytogenetics, as well as welcome financial support. Jim gladly accepted Heed’s offer.

For his second Master’s Thesis, this one on cytogenetics of *Perognathus* (pocket mice), Jim took a collecting trip to México with Al Gardner and Don Wilson. The three mammalogists worked their way down the western coast of mainland México, collecting *Perognathus* and driving south to San Blás, Nayarit, where their goal was to trap *Desmodus rotundus* (vampire bats) for the Arizona-Sonora Desert Museum. The Museum was going to pay for the bats, which was how Jim and Al were financing the trip. They knew they had to feed the bats on their way back, even though they were planning to drive nonstop. In anticipation of this, they had brought along a huge laboratory rabbit. Jim assured his field companions that he knew how to do a cardiac puncture on the rabbit, which would allow them to extract enough blood to feed the bats a couple of times, without injuring the rabbit. Having captured the bats, the collectors headed for home, and made their first feeding stop in a small glade of tropical forest that reaches its northern limit near San Blás. Al held the rabbit, and Jim carefully inserted a needle straight into its heart. The lagomorph gave one heavy sigh and promptly expired. While Jim looked puzzled and disappointed with the rabbit for giving up so quickly, Al swung into action and, holding the dead animal against a nearby tree trunk, relieved it of its head with a mighty swing of his machete. Exhorting Don to hold a dish under it, the small amount of blood that flowed from the corpse was carefully collected, defibrinated with glass beads, and fed to the bats using an

¹ Some workers (e.g., Robert J. Baker, Charles J. Cole, George C. Gorman) credit Jim’s technique with allowing them to develop their own productive careers in comparative karyology.

eyedropper. Heading on their way, the young men began worrying almost immediately about how they were going to manage another feeding without their involuntary blood donor. After the idea of using the lone undergraduate on the trip (Don) was reluctantly abandoned by Jim and Al, a complicated plan was hatched (involving impersonating physicians, an elderly swaybacked horse, a cash incentive, and bilingual cursing) that eventually produced enough blood to feed the bats, all of which survived, thereby providing the wherewithal to pay for the trip. More importantly, Jim got the necessary chromosomal material from his pocket mice, and an undergraduate student got a priceless education in field techniques.

The topic of Jim's thesis (Patton, 1965) was a descriptive, comparative karyological study of several species of *Perognathus*, which he interpreted in an evolutionary context (Patton, 1967a, 1967b). One of the species was *Perognathus goldmani* (now *Chaetodipus goldmani*, Goldman's pocket mouse), which consisted of several distinct chromosomal races that were separated geographically. Jim described some of those races in his thesis and he envisioned that his doctoral dissertation would be a continuation of that work, albeit in much greater detail (e.g., exploring the origin of those races, and whether they interbred in sympatry). However, while conducting fieldwork in the Patagonia Mountains of southern Arizona, he discovered a hybrid zone between two species of pocket gophers, *Thomomys bottae* (Botta's pocket gopher) and *T. umbrinus* (southern pocket gopher) and started to devote more and more time to that project. Consequently, he found himself debating whether to emphasize pocket mice or pocket gophers in his dissertation.

Jim never considered going to any institution other than U of A for his doctorate. He was comfortable at U of A, felt confident about his research, was engaged in numerous projects, and, having spent only one year in the Zoology Department, was still learning biology. Further, he was doing collaborative work with other graduate students and even faculty in his new department, specifically Charles J. Cole, John W. Wright, and Charles H. Lowe on karyotypic diversity in *Sceloporus* (spiny lizards; Lowe et al., 1967) and *Aspidoscelis* (formerly *Cnemidophorus*, the whip-tailed lizards), and Robert J. Baker on chromosome variation in bats (Baker and Patton, 1967; Nelson-Rees et al., 1968).

But Jim's research did not consume all of his waking hours. In the spring of 1961 he met Carol Porter, a freshman, at his U of A fraternity. Carol graduated from the university in 1964, and after spending approximately six months in Europe, returned to her native New York. After completing his Master's degree in May 1965, Jim went to Brown University, Rhode Island, in July of the same year to take a two-week workshop on mammalian cytogenetics.² Jim contacted Carol to

²At that workshop, offered by The Wistar Institute of Philadelphia and the Rhode Island Hospital in Providence, Jim met Tao-Chiuh Hsu, who was the dominant

let her know that he was going to be in Providence, and suggested that they could get together one weekend. Jim maintains that he “just wanted to say hi,” and that he had no ulterior motives. However, on June 4, 1966, Jim married Carol, “an intrepid trapper and field companion” (*Dedication* of Patton and Smith, 1990), and has been “saying hi” to her ever since.

After a New York wedding, Jim and Carol drove across country and combined their honeymoon with the American Society of Mammalogists annual meeting in Long Beach, California. This was both Jim’s first national meeting and the first time that he presented a professional paper. The talk, on the pocket gopher hybrid zone he had recently discovered in southern Arizona, caught the attention of the late Oliver P. “Paynie” Pearson, Director of the Museum of Vertebrate Zoology (MVZ) at U.C. Berkeley. Later that summer, Pearson telephoned Jim’s major professor to ask how long it would take Jim to finish his dissertation, and whether Jim would be interested in coming to Berkeley after completing his degree. When told about Paynie’s inquiry, Jim’s first reaction was along the lines of “Berkeley? Museum of Vertebrate Zoology? Where’s that? Who’s that?” He would soon find out.

THE BERKELEY AFFAIR

When Seth B. Benson’s retirement as an Associate Curator of Mammals in the Museum of Vertebrate Zoology became imminent, Paynie Pearson and Associate Curator of Mammals William Z. “Bill” Lidicker Jr. started to search for possible recruits for Benson’s position. Paynie and Bill quickly focused on Jim as a desirable candidate, and on May 10, 1967, a year and a half before he completed his Ph.D. degree, Jim gave a seminar at “MVZ Lunch,” an ongoing, long-standing Wednesday noon-time seminar series in evolutionary biology sponsored by the Museum. That seminar marked the beginning of the Museum’s successful recruitment efforts.

In the spring of 1968, Jim returned to Berkeley to conduct an official interview as the sole candidate for Benson’s position. Despite the fact that he “was scared to death,” he was offered the position of Assistant Curator of Mammals, and Assistant Professor in the Department of Zoology, starting July 1968. However, Al Gardner, then a Ph.D. student at Louisiana State University, Baton Rouge, invited Jim to accompany him and fellow graduate student John P. O’Neill to Perú that summer. Jim did not want to miss the opportunity to work both in the Amazon River basin and with a monolingual Indian tribe, the Cashinahua Jívaros. After Pearson agreed to let him postpone his arrival at Berkeley until January 1969, Jim

figure in mammalian cytogenetics at the time, and who subsequently (summer 1966) gave Jim a summer research position in his laboratory at the M. D. Anderson Hospital in Houston, Texas (Patton and Hsu, 1967).

accepted the Museum's offer and left for South America. Upon returning from Perú, he realized that he did not have enough time to finish the extensive fieldwork necessary for his study of the pocket gopher hybrid zone or to complete all of the pocket mouse chromosome work. Instead, he was only able to finish his research on karyotypic race evolution in Goldman's pocket mouse. Jim filed his 67-page dissertation (Patton, 1968) days before moving to California, and in June 1969 received his doctorate in Zoology, with a minor in Geochronology.

Recalling his first years at Berkeley, Jim remarked,

"When I arrived [on campus] I knew that I was in a game that I had never experienced before. I was convinced that Berkeley would see the error of its ways, and would pack me up and I'd be going some place else in the not-too-distant future. And in fact, I think that being convinced of that took all the pressure off of me. I decided to do my own thing because I knew I could not measure up to those guys [his colleagues at the MVZ and the Zoology Department], so I did not even try. And so I never really felt any pressure about being [a non-tenured professor at Berkeley], but I used to avoid like the plague running into [the late] Frank Pitelka³ any place or having a conversation with him."

Interestingly, Jim did not apply for a National Science Foundation grant during his entire career as an Assistant Professor, because he thought that his publications were the only relevant criterion for advancement. Hence, when he was being considered for tenure, he was surprised to learn that the fact that he did not have extramural research funds was a negative aspect of his dossier. Despite his concerns, Jim was promoted to Associate Professor of Zoology and Associate Curator of Mammals in 1974, and to Professor of Zoology and Curator of Mammals in 1979.

The aspects of academia that Jim likes most are "the challenges that the students provide [and that] they keep [him] alive and fresh; the quality of the undergraduates at Berkeley, even though they do not always live up to their capabilities; the freedom to set one's own program and pursue one's own interests; and the MVZ's policy of encouraging faculty to spend as much time in the field as possible." As anyone who knows Jim would predict, the aspect of academia that he *intensely* dislikes is "all the bureaucratic bullshit you have to put up with, and that gets in the way of us doing whatever it is that we are doing."

In 1987, the Field Museum of Natural History (FMNH) in Chicago, Illinois conducted an international survey to identify the best mammalian systematist in the world, with the goal of offering that individual a senior curatorial position. Jim

³A renowned ecologist in the Department, famous for his encyclopedic knowledge of biology and propensity for engaging students and colleagues in intellectually challenging exchanges.

was the unanimous choice for the job, and although he seriously entertained the idea of going to FMNH, he ultimately decided to remain at U.C. Berkeley. Greatly concerned about losing Jim to another institution, the University allocated \$80,000 for Jim to spend at his discretion, funds that he used to expand the MVZ Genetics Laboratory to include DNA methodologies.

“PEDAL TO THE METAL”

Jim calls himself an “evolutionary systematist who happens to work on mammals,” using the term “systematist” in the same manner as the eminent paleontologist George Gaylord Simpson, meaning a student of the diversity of life, not merely of taxonomy and phylogenetics. Jim’s primary research interests are population genetics, geographic divergence, systematics, and the biogeography of small, nonvolant mammals, with an emphasis on geomyid and South American rodents, as well as marsupials.

Jim’s first publications dealt almost exclusively with evolutionary cytogenetics, and these and subsequent articles established him as a leader in the field (Baker and Patton, 1967; Patton, 1967a, 1967b, 1969a, 1969b, 1970, 1971, 1972a, 1972b, 1973, 1977, 1981; Patton and Hsu, 1967; Patton and Dingman, 1968, 1970; Patton and Gardner, 1971; Patton and Myers, 1974; Gardner and Patton, 1976; Pearson and Patton, 1976; Bush et al., 1977; Patton and Yang, 1977; Reig et al., 1977; Patton and Feder, 1978; Patton et al., 1979; Patton and Sherwood, 1982, 1983; Hafner J. et al., 1983; Barros and Patton, 1985; Hafner M. et al., 1987; Patton and Rogers, 1993). In fact, only two years after completing his doctorate, he had already earned an international reputation as an authority on the application of karyotypic data to systematic research on mammals.

Jim’s detailed studies of the evolutionary genetics of *Thomomys* (pocket gophers) have produced a lengthy series of often cited publications on hybrid zone dynamics, genetic demography of local populations, and phylogeographic structure, and on the relationships of these factors to understanding species boundaries and speciation processes (Patton and Dingman, 1968, 1970; Patton, 1970, 1971, 1972b, 1973, 1981, 1985, 1990, 1993c; Patton et al., 1972, 1979, 1984; Patton and Yang, 1977; Patton and Feder, 1978, 1981; Smith and Patton, 1980, 1984, 1988; Patton and Smith, 1981, 1989, 1990, 1993, 1994; Patton and Sherwood, 1982; Sherwood and Patton, 1982; Hafner J. et al., 1983; Smith et al., 1983; Barros and Patton, 1985; Daly and Patton, 1986, 1990; Hafner M. et al., 1987; Patton and Brylski, 1987; Lessa and Patton, 1989; Patterson and Patton, 1990; Ruedi et al., 1997), as well as species accounts and popular articles (Patton, 1984a, 1993a, 1999a, 1999b, 2001). Although only three of his graduate students (María Alicia Barros, Mary Anne Rogers, Patricia A. Garvey-Darda) specifically worked on pocket gophers for their theses, other students (Juliana H. Feder, Margaret F. Smith, Mark S. Hafner, John C. Hafner, Steven W. Sherwood) and postdoctoral associates

(Joanne C. Daly, Enrique P. Lessa, Manuel Ruedi) have coauthored papers with him on these genetically diverse animals.

Together with his collaborators, Jim has published five monographs: *La Clasificación de los Mamíferos de los Aguaruna, Amazonas, Perú* (Berlín and Patton, 1979), *A Review of the Boliviensis Group of Akodon (Muridae: Sigmodontinae), with Emphasis on Peru and Bolivia* (Myers et al., 1990), *The Evolutionary Dynamics of the Pocket Gopher Thomomys bottae, with Emphasis on California Populations* (Patton and Smith, 1990), *Phylogeography and Systematics of the Slender Mouse Opossum, Marmosops (Marsupialia, Didelphidae)* (Mustrangi and Patton, 1997), and *Mammals of the Rio Juruá and the Evolutionary and Ecological Diversification of Amazonia* (Patton et al., 2000), which was featured in the *Forum* section of *Trends in Ecology and Evolution* (Sites, 2001). The latter monograph, possibly the most exhaustive study of Brazilian mammals completed during the last 150 years, reports the results of a ten-month expedition (August 1991 to June 1992) to western Brazil to study the genetics, systematics, ecology, and biogeography of small mammals along the Rio Juruá, the largest white-water tributary of the Amazon River with headwaters to the east of the Andes. Jim and three colleagues, Maria N. F. "Lelé" da Silva, Jay R. Malcolm, and Carlos A. Peres, surveyed the mammal fauna of the river system to test Alfred Russel Wallace's riverine barrier hypothesis (Wallace, 1852), which in its modern version states that the degree of differentiation of conspecific populations should increase along both sides of a river, from its headwaters to the mouth, as the barrier widens and the potential for cross-river gene flow diminishes. This elegant research was the subject of reports in *Science* (Morell, 1996a, 1996b) and *Discover Magazine* (Morell, 1997).

Jim and his colleagues have described species of bats (*Mimon*, Gardner and Patton, 1972), marsupials (*Philander*, Gardner and Patton, 1972), and rodents (*Oxymycterus*, Hinojosa et al., 1987; *Akodon*, Myers and Patton, 1989a, 1989b; Myers et al., 1990; *Punomys*, Pacheco and Patton, 1995; *Scolomys*, Patton and da Silva, 1995; *Isothrix*, Vié et al., 1996; *Neacomys*, *Rhipidomys*, *Mesomys*, Patton et al., 2000; *Trinomys*, Lara et al., 2002), and conducted revisions of multiple genera (*Proechimys*, Patton and Gardner, 1972; Patton, 1987; *Isothrix*, Patton and Emmons, 1985; *Scolomys*, Patton and da Silva, 1995; *Philander*, Patton and da Silva, 1997) and groups of species within genera (taxa formerly placed in the subgenus *Urosciurus* of *Sciurus*, Patton, 1984b; the *fumeus* and *boliviensis* groups of *Akodon*, Myers and Patton, 1989b; Myers et al., 1990; Peruvian *Akodon*, Patton and Smith, 1992a). Jim has also published checklists and species accounts of mammals from the New World (Patton, 1993a, 1993b; Myers and Patton, in press; Patton and da Silva, in press; Patton and Gardner, in press; Patton and Stein, in press a, b), and more specifically from southeastern Perú (Pacheco et al., 1993), Brazil (Fonseca et al., 1996; Patton et al., 2000), and northwest México (Patton, 1999a, 2000; Patton and Álvarez-Castañeda, 1999). He has co-edited four volumes: *Mamíferos del Noroeste de México* (Álvarez-Castañeda and Patton, 1999), *Mamíferos del Noroeste de México II*

(Álvarez-Castañeda and Patton, 2000), *Life Underground: The Biology of Subterranean Rodents* (Lacey et al., 2000), and *Handbook of South American Mammals, Volume I* (Gardner et al., in press), and is currently working with his co-editors on Volumes II and III of the latter series.

In addition to his extensive studies of rodents and marsupials, Jim has conducted research on fruit flies (Patton and Heed, 1965), lizards (Lowe et al., 1967), caecilians (Wake et al., 1980), tortoises (Marlow and Patton, 1981), finches (Yang and Patton, 1981), bats (Baker and Patton, 1967; Nelson-Rees et al., 1968; Patton and Gardner, 1971), and monkeys (Peres et al., 1996). He has also published on such diverse topics as ethnomammalogy (Patton et al., 1982; Fleck et al., 1999), the origin of eutherian mammals (Lillegraven et al., 1987), and demographic responses to climate change (Lessa et al., 2003).

Jim has been among the leaders in applying new types of data (i.e., karyotypes [Patton, 1969a], allozymes [Patton et al., 1972], mitochondrial DNA sequences [Smith and Patton, 1991b]) to genetic analyses, and has endeavored to understand the nature of molecular markers and their relevance to organismal evolution (Patton and Sherwood, 1982; Smith et al., 1992). He is also responsible for major conceptual advances in our understanding of chromosome evolution and speciation, and for providing a population genetic perspective on the nature of species (Bush et al., 1977; Reig et al., 1977; Patton and Sherwood, 1983; Patton and Smith, 1994). Jim was also one of the first workers to use molecular genetic data to test explicitly hypotheses of evolutionary and ecological diversification (Patton et al., 1990, 1994; Patton and Smith, 1992b). Although his research is centered on the organism, his approach to biology is synthetic (e.g., Patton and Yang, 1977; Patton et al., 1979, 2000; Daly and Patton, 1986; Patton and Brylski, 1987; Patton and Smith, 1990, 1993; Moritz et al., 2000; Figure 1).

Despite this impressive list of accomplishments, Jim does not believe that he has made any major contributions to science. He acknowledges that he is proud of what he has done, and he sees himself as a meticulous worker who generates a lot of data and who is conservative in their interpretation. "In doing what I do, I try to do the best I can in my limited capabilities, intellectually or technically. I've tried to extend beyond the norm." Jim strongly believes that he is "the product of the intellectual development of colleagues (notably David B. Wake) in the atmosphere of the MVZ, and as such [he] epitomizes the case of nurture over nature."

Whatever Jim has gained from his associates, he has repaid them many times over. As a citizen of many constituencies, ranging from close Berkeley colleagues to biologists the world over, Jim is phenomenally responsible, supportive, and inspiring. He has served on countless committees within and outside of the University, and he always contributes beyond the normal call of duty. Within his own discipline, Jim served as President of the American Society of Mammalogists from 1992 to 1994. In 1983 he received the Society's C. Hart Merriam Award, in

recognition for his “outstanding contributions to the discipline of mammalogy.” In 1998 he received the Society’s The Joseph Grinnell Award for Excellence in Education in Mammalogy, and in 2001 was awarded an Honorary Membership. The latter is the highest award given by the Society, for “significant, lifetime achievements in science and service to the discipline of mammalogy.”

James L. Patton’s Science: A Model of Holistic Evolutionary Biology

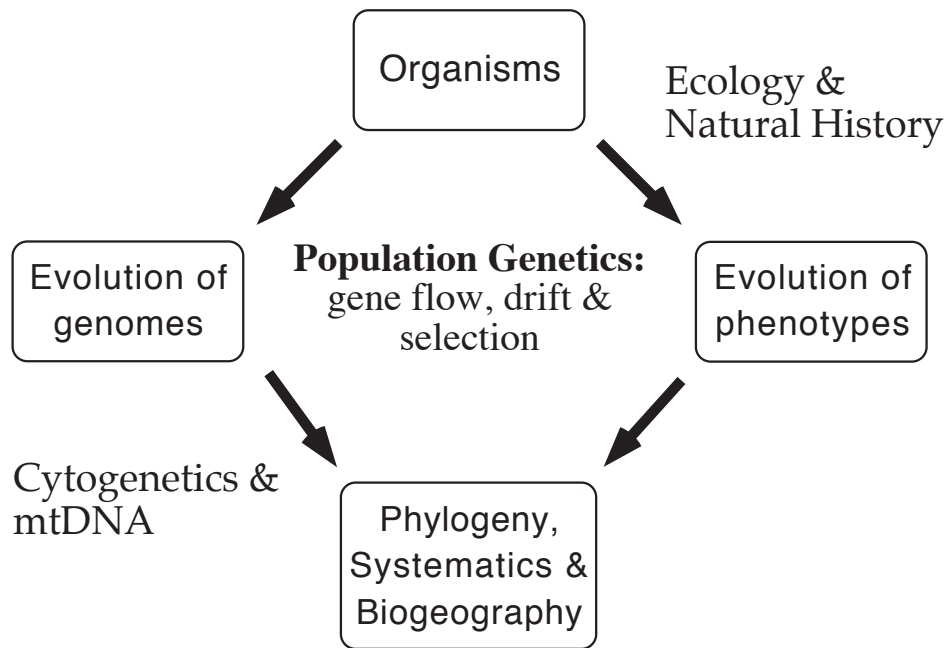


Figure 1. A diagram of James L. Patton’s philosophy of science (modified from a talk given by Craig Moritz on June 24, 2001 at the University of California, Berkeley).

Jim never seems to tire of teaching naive but interested herpetologists about tropical rats and desert mice, often on the spur of the moment, and ideally over a tray full of museum specimens. For an academic, he is remarkably free of jealousy toward his closest colleagues, instead regarding their accomplishments with obvious pride. In all aspects of his professional life, Jim leads by example. As David Wake, Director of the Museum of Vertebrate Zoology from 1971 to 1998, said, “The most remarkable thing about Jim is that he does it *all himself*, and that he *masters everything* he does. Jim wakes up in the morning, puts on his pants, and

goes to work.” Enrique P. Lessa, a former postdoctoral associate of Jim appropriately noted, “I also put on my pants after getting out of bed, but all similarities between Jim and I end right there.”

GUIDING GOLDEN BEARS

Jim is an accomplished educator. Despite the fact that one of his favorite mottos is “the only good student is a *stressed* student,” both undergraduate and graduate disciples find his teaching style engaging and thought-provoking. At U.C. Berkeley, he has taught undergraduate courses in Introductory Biology, Cytogenetics, the mammal section of Vertebrate Natural History, and Mammalogy, in addition to a graduate seminar on speciation, and occasional graduate colloquia on topics such as Alfred Russel Wallace and phylogeography. An easily overlooked aspect of Jim’s teaching at Berkeley is his joint establishment with Bill Lidicker of the Mammal Discussion Group, which ran from 1973 to 1997. The group provided an intellectual and “social” home for mammalogists with diverse interests and from several departments on campus.

Jim mentored five masters and 31 doctoral students, and sponsored eleven postdoctoral researchers during his tenure at U.C. Berkeley (Table 1). He claims that with respect to his graduate students he “was schizophrenic, and did a very poor job of mentoring them in the most important way: intellectually [=conceptually], because [he is] not very intellectual [himself].” Nevertheless, he believes that he “did a good job of helping [his] students develop self confidence, and giving them freedom to pursue the questions they were interested in. [He] developed a strong sense of collegiality with all [his] students, and they “didn’t hesitate in coming to [him] when they had personal or other kinds of problems.” On several occasions when his students were experiencing harsh financial times, Jim paid their registration fees, bought them field equipment, computers, and even paid for their laboratory research out of pocket. Jim affirms that what he has always had to offer is a “strong push” and a work ethic that demands that he tries to do anything to the best of his abilities - if he does not accomplish his goal it is not for lack of trying. He hopes that if he is going to have any legacy, it is that he instilled in his students the canon that “you are never going to get anywhere in life unless you put out the effort personally; push yourself as far as you can go, and rely on others around you to help push you a little bit further.” He proudly asserts that *all* of his students completed their degrees and, for the most part, they have gone on to have productive careers. He has coauthored articles with many of his former graduate students, but his associations with Margaret F. “Peg” Smith and Maria N. F. da Silva have been especially prolific (Patton et al., 1979, 1984, 1989, 1990; Smith and Patton, 1980, 1984, 1988, 1991a, 1991b, 1993, 1999; Patton and Smith, 1981, 1989, 1990, 1992a, 1992b, 1993, 1994; Hafner J. et al., 1983; Smith et al., 1983, 1992, 2001; Zink et al., 1985; Hafner M. et al., 1987; Myers et al., 1990; da Silva

and Patton, 1993, 1998; Patton et al., 1994, 1996a, 1996b, 1997, 2000; Patton and da Silva, 1995, 1997, 1998, 2001, in press; Lara et al., 1996; Peres et al., 1996; Ruedi et al., 1997; Gascon et al., 2000; Matocq et al., 2000; Geise et al., 2001).

Jim's teaching abilities are well known in México and South America. Perhaps he is most admired in Brazil, as from 1988 to 2001 he advised six doctoral students (Table 1), and since 1989 has trained dozens of Brazilian students and senior researchers in the field and in the laboratory. Every one of them has been fascinated and has gained from his skills as a field biologist and as an educator.

In 1991, Jim received the Distinguished Teaching Award, granted by the Academic Senate of the University of California, Berkeley, in recognition for his excellence in this arena. As noted above, in 1998 the American Society of Mammalogists presented him with The Joseph Grinnell Award for Excellence in Education in Mammalogy "in recognition for outstanding and intense education of graduate and undergraduate students at the University of California, Berkeley, in mammalogy, and for sharing his deep knowledge of mammals willingly with all students." From the extensive documentation for that case and our own years of observation, we know that Jim's success as a teacher stems, as with other activities, from his insistence on high expectations, his understated but profound affection and concern for others, especially for younger people, and from his leadership by example. Jim's class lectures are fast-paced, jam-packed with information, and flawlessly delivered. His praise for students' work is heartfelt and encouraging, and his criticisms are given in a straightforward manner that makes one want to do better. On field trips Jim is always the first one up the hill, and everyone flocks around whenever he stops to examine something. Students revere Jim, and it may not be an exaggeration to say they would walk off a cliff for him – if he went first.

Claudia Luke aptly described the feelings of hundreds of students who have taken Mammalogy from Jim in a letter she wrote to him on July 4, 2001:

"I can say truthfully that your mammalogy class was the most challenging, rewarding, and exciting class that I've ever taken. It set a standard of excellence for me and gave me skills that I have used over and over again. In the last ten years, I have been learning more how people learn and trying to design field courses based upon those concepts. And even as I break down learning into its component parts, I find that all these pieces naturally came together in your class and teaching style. Your interest and enthusiasm, placing mammalogy as the subject rather than yourself as the expert, providing the materials and experiences that brought students together socially, motivating individuals to find what interests them, and above all expecting only the best from your students and yourself."

Table 1. Graduate students mentored and postdoctoral researchers sponsored by James L. Patton. For graduate students, names are listed in chronological order (starting in the left column), according to the year in which each person completed their degree (shown in parentheses).

Doctoral Students

Philip Myers (1975)	Francis X. Villablanca (1993)
Sally J. Holbrook (1975)	Márcia C. Lara (Brazil) (1994)
Susan M. Case (1976)	Mary Ellen Holden (1995)
Margaret F. Smith (1978)	Bernard Peyton III (1995)
Mark S. Hafner (1979)	Maria N. F. da Silva (Brazil) (1995)
Donald O. Straney (1980)	Meika A. Mustrangi (Brazil) (1995)
John C. Hafner (1981)	Elizabeth A. Hadly (1995)
Steven W. Sherwood (1983)	Albert D. Ditchfield (Brazil) (1996)
Laurence G. Frank (1984)	Luis F. García (Colombia) (1999)
William E. Rainey (1984)	Tina M. Hambuch (2000)
Elizabeth D. Pierson (1986)	Marjorie D. Matocq (2000)
Duke S. Rogers (1986)	Randall S. Reiserer (2001)
Ángel Spotorno O. (Chile) (1986)	Leonora Pires Costa (Brazil) (2001)
Patrick A. Kelly (Ireland) (1990)	Yuri L. R. Leite (Brazil) (2001)
Claudia A. Luke (1992)	Steve Takata (2002)
Hon-Tsen Yu (Taiwan) (1992)	

Masters Students

Juliana H. Feder (1977)	Mary Anne Rogers (1983)
Pamela L. Williams (1982)	Patricia A. Garvey-Darda (1988)
María A. Barros (Venezuela) (1983)	

Post-Doctoral Scholars

James T. Mascarello	Eileen A. Lacey
Margaret F. Smith	Manuel Ruedi (Switzerland)
Joanne C. Daly (Australia)	John Carlos Garza
Enrique P. Lessa (Uruguay)	Nathan R. Lovejoy (Canada)
Liliana I. Apfelbaum (Argentina)	Maria José de Jesus Silva (Brazil)
Sergio F. dos Reis (Brazil)	

SEAMAN PATTON

Jim is notorious for the series of boating incidents – most of them actually accidents – that he and his unsuspecting traveling companions have experienced over the years. For purposes of completeness, we feel compelled to include a brief description of those events in this biographical sketch.

Episode I, The Omen: On November 1, 1954, Jim's mother and her two sons departed from New York aboard the U.S. Navy ship *A. M. Patch* for Bremerhaven, Germany. Halfway across the northern Atlantic the vessel encountered stormy weather, causing the trip to take longer than usual. Jim was completely unaffected by the rugged journey, but John was in misery most of the time, much to his brother's amusement.

Episode II: In early January 1966, Oscar Soule, Carol Patton, and Jim hired a Mexican fisherman to take them to Isla Dátil (=Turners Island), located southeast of Isla Tiburón, in the Gulf of California. On their way to the island they were hit by a sudden "chubasco" winter storm, their 15-footer boat flooded, and they were forced to seek refuge on Isla Tiburón. In the middle of the night the storm intensified and the waves smashed their dinghy against the rocks. As a result, the party, which originally was going to be out for only one night, was stranded for eight days before being rescued by another fisherman.

Episode III: Returning to Costa Rica in May 1972, after spending approximately four weeks conducting field work in the Galápagos Islands, the research vessel that Jim and his colleagues were using caught fire and burned to the water line, forcing all aboard into a crowded life raft. "Fortunately," the boat went down approximately 150 km off the Costa Rican coast, in the middle of a shipping channel for boats exiting the Panamá Canal. After drifting in the eastern Pacific Ocean for some hours, the shipwrecked passengers were rescued by a Mexican vessel en route to Kobe, Japan. The ship's captain received permission to veer into Mexican waters, and dropped off the researchers in Acapulco a few days later. Of all of Jim's boating accidents, this one ultimately proved the most serious, as essentially everything was lost – specimens, data, field notes, equipment, wallets, passports and other personal documents – and all vestiges of what had been an enormously successful trip sank to the ocean floor. The single exception was the captain's personal documents, which he managed to retrieve before boarding the life raft ahead of everybody else.

Episode IV, The Saga Continues: In August 1978, Jim and his colleagues left (by boat) from Huampami, an Aguaruna Jívaro indian village in northern Perú where they had maintained a base camp for two years. Shortly thereafter, their vessel sank in the Río Cenepa, resulting in another loss of specimens and data.

Episode V: When Philip "Phil" Myers, John E. Cadle, Carol, and Jim were working on the Río Alto Madre de Dios in southern Perú in May 1984, their boat,

piloted by two rather intoxicated individuals, ran out of gas while traveling upriver, in rapids, and in near darkness. They almost capsized and had to struggle to get the boat to a bank of rough cobbles. They managed to preserve their belongings, but their situation was precarious for a few hours.

Episode VI, The Inevitable: In late July and early August 1989, Maria da Silva, Jay Malcolm, Carlos Peres, and Jim were in the Brazilian Amazon planning their survey of small mammals along the Rio Juruá. Jim pointed out that they should not begin their surveys in 1990, as that was the year of his next “scheduled” boating accident (notice the periodicity of Jim’s boating accidents; Figure 2). As it turned out, it took two years to secure the necessary funding, and thus they began their expedition in August 1991. On February 3, 1992, their research vessel, the *Coró-Coró*, sank in the headwaters of the Rio Juruá following a collision with a submerged log (Patton et al., 2000: 29).

Prompted by these events, when asked to give advice to graduate students planning to accompany Jim to the field, Paynie Pearson immediately stated, “Don’t go!” Urged to elaborate, he added “But if you must, find out whether there is any large body of water close to the field site, and if that’s the case, make sure that you bring a life jacket, and take heavy insurance against freshwater and marine disasters.”

VIGNETTES

Jim is widely known for his loud voice, tenacious – but not dogmatic – opinions, and fondness for punctuating his remarks with colorful expletives. He used to get mad with relative ease, and the warning “Stay away from Jim today!” was often heard in the hallways and graduate student offices of the old MVZ. Although his temperament has calmed in recent years, the possibility of witnessing an episode of rage still exists. Not long ago, his lack of success at figuring out how to get a new water cooler to provide him with hot water for his morning instant coffee unleashed Jim’s dormant wrath in an extremely audible manner.

Among his personal heroes, Jim counts the celebrated naturalist Alfred Russel Wallace, the father of zoogeography and codiscoverer of the theory of evolution by natural selection; Theodore Roosevelt, the 26th President of the United States, a man of impressive intellectual achievements and an eminent naturalist whose presidential policies advanced conservation causes; George S. Patton Jr. (no close relation to Jim), probably the most admired and controversial of all United States generals in World War II, a superb military tactician, but also an impetuous, demanding, and ruthless character; and renowned evolutionary biologist David Wake, Jim’s colleague in the MVZ since 1969, and his intellectual role model.

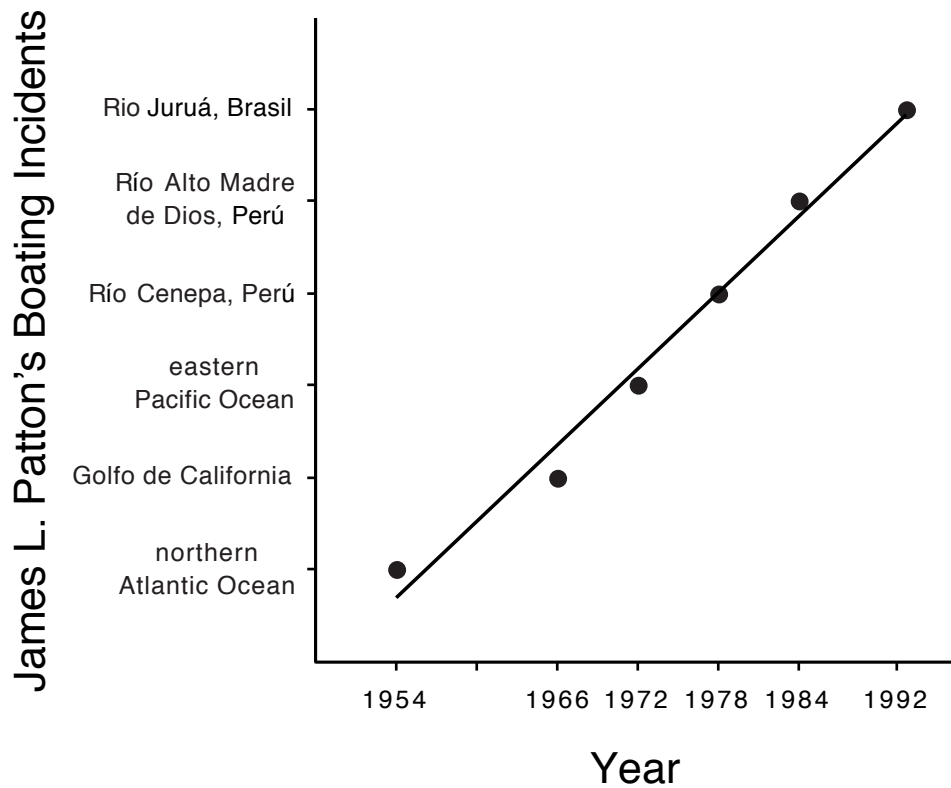


Figure 2. Chronology of James L. Patton's boating incidents (adjusted $r^2 = 0.98$, $F_{(1,4)} = 246.7$, $p < 0.0001$).

Jim is in excellent physical condition, as he maintains a regular exercise program to keep in shape for conducting fieldwork. Indeed, he routinely outperforms younger colleagues on long, arduous hikes. His nephew, John (30 years old as of January 2005), who sees Jim as a role model, still marvels that he has never been able to beat "Uncle Jimmy" in arm-wrestling.

Jim is a superb field biologist. He thoroughly enjoys conducting fieldwork in remote places and under the most demanding conditions. Even the simplest commodity is resented and considered excessive in the field, a sentiment that his field companions do not always share. He likes to go to places that most people do not, and he enjoys the physical challenges that this entails. Since 1963, he has conducted fieldwork in México, the Galápagos Islands, Perú, Venezuela, Argentina, Brazil, Colombia, Taiwan, Vietnam, Iran, and Cameroon. As of March 24, 2004, he had entered 20,810 specimens into his catalogue (including one bird, two snakes, nine salamanders, and 88 frogs). He insists that one must eat what

one traps, and, on numerous occasions, after preparing a study specimen, he has eaten the muscle and tissue that would normally be discarded.

For Jim, one of the most important things in life for a field biologist is to identify specimens correctly. By early 1980, one of us (H.W.G.) felt that things had become somewhat stale in the MVZ, and decided to lighten up the mood by renting a gorilla suit. On April 1 (April Fool's Day), Harry put on the costume and visited various biology classrooms, "saying hi" as a gorilla. In the afternoon, he returned to the Museum. At that time, when you entered the front office of the MVZ, the Administrative Assistant's office was immediately to the right. Harry entered the Museum to find Jim leaning across her desk, banging his fist, his voice elevated and angry (some of us know what that can be like). The lady was looking Jim in the eye, wagging a finger in his face, and practically yelling at him. Harry entered the office and stood quietly to the side. After a few seconds, she looked up and exclaimed, "Oh my God, Dr. Patton, there's a bear in here!" Jim quickly looked over, snapped his head back around and immediately replied, "THAT'S NOT A BEAR, IT'S A GODDAMNED GORILLA!" and went right back to banging his fist on the desk and continuing his argument.

Jim is a devoted fan of the 1990 science fiction movie *Tremors*, about the small, isolated town of Perfection, Nevada (14 inhabitants) that finds itself under siege by four monstrous, subterranean wormlike creatures (dubbed "Graboids") that hunt by sensing vibrations in the ground. The plot revolves around the townspeople trying to outwit and escape the creatures, which are tearing the town out from under them. The movie received excellent reviews when it was released, became a "cult hit," and, according to Jim, is the most entertaining movie Hollywood has ever produced. Rumor has it that he *still* watches it two or three times a month, and that he has worn out several copies. Jim also used to watch the television show *Buffy the Vampire Slayer*, in which a teenager girl learns that she belongs to a lineage of ancient vampire killers. After training under the watchful eye of a mentor, she became a spandex-wearing, kung-fu kicking, stake-stabbing slayer of roaming vampires and all sorts of demonic monsters. Jim claims that he watched the show for "total escapism."

CONCLUDING REMARKS

On June 23, 2001, during the banquet to celebrate Jim's retirement, David Wake, acting on behalf of the Chancellor of the University of California, Berkeley, presented Jim with The Berkeley Citation for Distinguished Achievement. This award, equivalent to an honorary degree, is the highest distinction bestowed by the Berkeley campus on a faculty member. Deeply moved by this unusual, but most deserved recognition, Jim nervously stood up, and remained speechless, while the audience, composed of his wife Carol, his brother John, and former and present colleagues, students, and coworkers, gave him a sincere, effusive, and

lengthy ovation. John later asserted, "It was truly incredible to see the significant impact Jim has had on the lives of so many, and the affection and admiration that many have for him. I am extremely proud of my little brother!"

Jim's "retirement" became effective on July 1, 2001, but there has been no diminution in his teaching and research, and he remains Curator of Mammals at the MVZ; only his work in academic committees has substantially decreased. He states that "I have no plans for retirement. I'm a little bit scared of retirement. I know what I'm going to do for the next year or so, but I don't know what I'll be doing ten years from now." We know that Jim will always find interesting projects that will keep him occupied.⁴

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⁴In May 2003, Jim and several colleagues from the MVZ began working on a three-year project to reprise a survey of Yosemite National Park wildlife initially conducted by Joseph Grinnell and Tracey I. Storer between 1914 and 1920. The goal of the project is to gather new baseline data to compare to the Grinnell and Storer surveys to determine whether there have been any changes in the abundance or distribution of mammals, birds, amphibians, and reptiles in the park.

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- 1984 Dynamics of morphological differentiation: temporal impact of gene flow in pocket gopher populations. *Evolution* 38:1079–1087.
- 1988 Subspecies of pocket gophers: causal bases for geographic differentiation in *Thomomys bottae*. *Syst. Zool.* 37:163–178.
- 1991a PCR on dried skin and liver extracts from the same individual gives identical products. *Trends Genet.* 7:4.
- 1991b Variation in mitochondrial cytochrome b sequence in natural populations of South American akodontine rodents (Muridae: Sigmodontinae). *Mol. Biol. Evol.* 8:85–103.
- 1993 The diversification of South American murid rodents: evidence from mitochondrial DNA sequence data for the akodontine tribe. *Biol. J. Linn. Soc.* 50:149–177.

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- 1983 *Thomomys bottae* pocket gophers of the central Rio Grande Valley, New Mexico: local differentiation, gene flow, and historical biogeography. *Occ. Pap. Mus. Southwest. Biol., Univ. New Mexico* 2:1–16.

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- 1996 A new species of *Isothrix* (Rodentia: Echimyidae) from French Guiana. *Mammalia* 60:393–406.

Wake, M. H., J. C. Hafner, M. S. Hafner, L. L. Klosterman, and J. L. Patton

- 1980 The karyotype of *Typhlonectes compressicauda* (Amphibia: Gymnophiona) with comments on chromosome evolution in caecilians. *Experientia* 36:171–172.

Wallace, A. R.

- 1852 On the monkeys of the Amazon. *Proc. Zool. Soc. Lond.* 20:107–110.

Yang, S. Y., and J. L. Patton

- 1981 Genic variability and differentiation in the Galapagos finches. *Auk* 98:230–242.

Zink, R. M., M. F. Smith, and J. L. Patton

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Appendix 1. Publications by James L. Patton during his years as a Curator in the Museum of Vertebrate Zoology. This list, which was compiled by the editors of the volume, includes all publications authored or co-authored by Jim between 1969 and 2005. Entries are presented according to the year of publication in order to capture the conceptual, technological, and taxonomic trends that have characterized Jim's career.

1969

Patton, J. L. Chromosome evolution in the pocket mouse, *Perognathus goldmani* Osgood. *Evolution* 23:645-662.

Patton, J. L. Karyotypic variation in the pocket mouse, *Perognathus penicillatus* Woodhouse (Rodentia-Heteromyidae). *Caryologia* 22:351-358.

1970

Patton, J. L., Karyotypic variation following an elevational gradient in the pocket gopher, *Thomomys bottae grahamensis* Goldman. *Chromosoma* (Berlin) 31:41-50.

Patton, J. L. Chromosome studies of pocket gophers, genus *Thomomys*. II. Variation in *T. bottae* in the American southwest. *Cytogenetics* 9:139-151.

1971

Patton, J. L. Possible genetic consequences of meiosis in pocket gopher (*Thomomys bottae*) populations. *Experientia* 27:593-595.

Patton, J. L., and A. L. Gardner. Parallel evolution of multiple-sex chromosome systems in the phyllostomatid bats, *Carollia* and *Choeroniscus*. *Experientia* 27:105-106.

1972

- Patton, J. L., R. K. Selander, and M. H. Smith. Genic variation in hybridizing populations of gophers (genus *Thomomys*). *Syst. Zool.* 21:263-270.
- Patton, J. L. A complex system of chromosomal variation in the pocket mouse, *Perognathus baileyi* Merriam. *Chromosoma* 36:241-255.
- Patton, J. L., and A. L. Gardner. Notes on the systematics of *Proechimys* (Rodentia: Echimyidae), with emphasis on Peruvian forms. *Occas. Papers Mus. Zool. (Louisiana)* 44:1-30.
- Gardner, A. L., and J. L. Patton. New species of *Philander* (Marsupialia: Didelphidae) and *Mimon* (Chiroptera: Phyllostomidae) from Peru. *Occas. Papers Mus. Zool. (Louisiana)* 43:1-12.
- Patton, J. L., and J. K. Jones, Jr. First records of *Perognathus baileyi* from Sinaloa, Mexico. *J. Mammal.* 53:371-372.
- Baker, R. J., A. L. Gardner, and J. L. Patton. Chromosomal polymorphism in the phyllostomatid bat, *Mimon crenalatum* Geoffroy. *Experientia* 28:969-970.

1973

- Patton, J. L. Patterns of geographic variation in karyotype in the pocket gopher, *Thomomys bottae* (Eydoux and Gervais). *Evolution* 26:574-586.
- Patton, J. L. An analysis of natural hybridization between the pocket gophers, *Thomomys bottae* and *Thomomys umbrinus*, in Arizona. *J. Mammal.* 54:561-584.
- Patton, J. L. Committee for standardization of chromosomes of *Peromyscus*, Standardized karyotype of deer mice, *Peromyscus* (Rodentia). *Cytogenetics* 19:38-43.

1974

Warner, J. W., J. L. Patton, A. L. Gardner, and R. J. Baker. Karyotypic analyses of twenty-one species of molossid bats (Molossidae: Chiroptera). *Can. J. Gen. Cytol.* 16:165-176.

Patton, J.L., and P. Meyers. Chromosomal identity of black rats (*Rattus rattus*) from the Galapagos Islands, Ecuador. *Experientia* 30:1140-1141.

1975

Patton, J. L., S. Y. Yang, and P. Myers. Genetic and morphologic divergence among introduced rat populations (*Rattus rattus*) of the Galapagos Archipelago, Ecuador. *Syst. Zool.* 24(3):296-310.

1976

Patton, J. L., H. MacArthur, and S. Y. Yang. Systematic relationships of the four-toed populations of *Dipodomys heermanni*. *J. Mammal.* 57:159-163.

Gardner, A. L., and J. L. Patton. Karyotypic variations in oryzomyine rodents (Cricetinae) with comments on chromosomal evolution in the Neotropical cricetine complex. *Occas. Papers Mus. Zool. (Louisiana)* 49: 48 pp.

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