

**BIOGRAPHICAL SKETCH
AND
BIBLIOGRAPHY OF STEPHEN D. BUSACK**



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Rochester, New York

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The first number of the SMITHSONIAN HERPETOLOGICAL INFORMATION SERVICE series appeared in 1968. SHIS number 1 was a list of herpetological publications arising from within or through the Smithsonian Institution and its collections entity, the United States National Museum (USNM). The latter exists now as little more than the occasional title for the registration activities of the National Museum of Natural History. No. 1 was prepared and printed by J. A. Peters, then Curator-in-Charge of the Division of Amphibians & Reptiles. The availability of a NASA translation service and assorted indices encouraged him to continue the series and distribute these items on an irregular schedule.

The series continues under that tradition. Specifically, the SHIS series distributes translations, bibliographies, indices, and similar items judged useful to individuals interested in the biology of amphibians and reptiles, and unlikely to be published in the normal technical journals. We wish to encourage individuals to share their bibliographies, translations, etc. with other herpetologists through the SHIS series. If you have such an item, please contact George Zug [zugg @ si.edu] for its consideration for distribution through the SHIS series.

Our increasingly digital world is changing the manner of our access to research literature and that is now true for SHIS publications. They are distributed now as pdf documents through two Smithsonian outlets:

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All numbers from 1 to 131 [1968-2001] available in BHL.

DIVISION'S WEBSITE. vertebrates.si.edu/herps/herps_nmnh_herppubs/herps_herps.html

Numbers 84 to 154 available as pdfs in the herpetological publications section of the website.

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Acanthodactylus busacki Salvador 1982

From the vicinity of TanTan and Smara, SW Morocco.

Photographed by Michel Geniez.

Biographical Sketch of an Accidental Herpetologist

Rochester, New York, in its Nearctic position, is an unlikely generator for an interest in herpetology. No immediate explanation for my interest comes to mind, but it came early and evolved quickly.

My mother was born (1920), in Poland, and her family fled Europe in the early 1930s. My father's genetic heritage remains somewhat a mystery (I first met his mother during my 14th year; she lived in Rochester, and was of European origin), but my brother's DNA suggests eastern Europe as the family's genetic origin. I only recently discovered that our surname is a common one in the Ukraine. My mother graduated high school in Rochester, and my father earned a General Education Diploma while serving as a machinist's mate in the U.S. Navy. Following military service he pursued a career with the U. S. Postal Service, to which he added, concurrently, driving a school bus; he retired with full benefits from both. My mother retired from a clerical position with the Town of Henrietta (NY) after holding various other positions during my childhood.

By the time I was born (1944) Sherman C. Bishop's (University of Rochester, 1928 to 1951) influential volume on salamanders of the United States and companion volume on New York salamanders had been published (1943). Dr. Bishop was then 74 years of age and in poor health. When I was a pre-teen, my maternal grandfather (native of Pomerania [contemporary Poland]), talked with me of his experiences involving the Kreuzotter (*Vipera berus*) on the family's farm. The fact that I recall these conversations to this day suggests, likely, a marked interest in herpetology at an early age.

While pre-high school memories of herpetological discovery in Henrietta, NY, are few, at roughly 8 years of age I was restricted to a small area of government housing on the Naval Base in Long Beach, CA, where my father was briefly stationed, and through which snakes would trespass and be quickly dispatched. When my father was released from active duty, and I learned we would be returning to New York, rumor has it I protested loudly—snow and cold were never high on my list of desirable experiences. As I aged, my primary goal to escape New York and its winters was renewed annually (there are Post Offices in California after all), and quieted with the promise that when I grew up I could live anywhere I chose. Until I “was older,” I surrendered to making the best of what was available. My “home range” was restricted by the fact that there is no public transportation in the town of Henrietta. Exploration by one speed bicycle was mediated by terminal moraine, climatic influence, and parental directive and my leg muscles have never been as strong as when I pedaled around Monroe County as weather permitted.

Shortly after its publication (1958), I happened upon Roger Conant's Field Guide in a book store. It led me eventually to the Philadelphia Herpetological Society (PHS), and the Herpetologists' League. When I joined the League (~1960), I purchased a complete back set of *Herpetologica*, and initiated letter exchanges with Norma and Barry Rothman, Chapman Grant, Laurence M. Klauber, and several others. Eventually I began routine correspondence with C. J. (“Jack”) McCoy, Jr. and R. Bruce Bury, each of whom had placed advertisements for exchange of local amphibians and reptiles in the *PHS Bulletin*, and each of whom later became my work supervisors. My expanding list of correspondents eventually included herpetologists in Puerto Rico, Great Britain, Germany, Israel, Japan, Rhodesia, and throughout the United States. This period, ages 14 through high school, essentially opened and enriched the interest that continues to this day.

While in high school, I joined the Seneca Zoological Society sponsored by the local zoo. I attended monthly meetings organized by two local herpetoculturists. Robert H. Wilson (Assistant Professor, Department of Radiation Biology and Atomic Energy Project, University of Rochester [see Stannard 1989]) and his wife Connie. They became friends, and introduced me to the art and science of maintaining reptiles in the home (see Wilson 1959). Knowing Mr. Wilson came with major side benefits; he had timely access to rodent colonies where experimental animals were bred, and when breeder rats aged out or were over-produced, I would be notified and “culls” would be made available for freezing as snake food. Having a supply of fresh-frozen rodents at no cost made it economical for my snake collection to expand and thrive. During those years I gave informational presentations to various groups around the area, published a brief note in *Herpetologica* (1959) and, along with a few snakes and lizards, once appeared on a children’s television show. This latter event led to a newspaper article (*Rochester Times Union*, June 1960, during what must have been a very slow news week) and may have precipitated an unusual investigation into animal cruelty. A report was made that I was feeding kittens and puppies to my Boa Constrictor. Local ASPCA investigators correctly determined the report was false; the complaint was ultimately dismissed as unfounded. Local touring, however, was thereafter discontinued.

By the summer of 1959, I had read Neill (1950), Klauber (1935), and Slevin (1927) regarding proper data recording and preservation of amphibians and reptiles, and had already amassed a significant collection of preserved local amphibians and reptiles for reference (many currently serving as historical data points for Monroe County, NY, and are housed at Carnegie Museum and elsewhere). I also began exchanges for exotic specimens (e.g., *Naja haje* from D. G. Broadley; *Atheris nitschei* from Mission G. F. De Witte; *Euprepiophis conspicillatus* from H. Fukada to note but a few). That same year the family took a camping trip across the United States. My brother and I were each granted two “stops” along the route—I chose to visit Laurence M. Klauber in San Diego and Ross Allen’s Reptile Institute in Silver Springs. After my choices were approved, I wrote to Klauber and arranged the visit—the sheer magnitude of his library and specimen collection made a solid impression. As my visit ended, he gave me samples of his specimen registration cards and stressed the importance of keeping good records—he encouraged my parents to support my interest, and expressed a national need for more professional herpetologists. My copy of *Rattlesnakes* (currently in the A. M. Bauer library) bears the inscription “...Laurence M. Klauber, San Diego, California, July 27, 1959, with best wishes from a fellow amateur herpetologist.”

Living non-venomous snakes could legally be sent through the U. S. Mail back then. A Rubber Boa (*Charina bottae*) from Utah, a Whipsnake (*Masticophis flagellum*) from Arizona, and several other reptile additions for my growing personal collection were mailed to the Wilsons for care and feeding. A Timber Rattlesnake from North Carolina accompanied us to Rochester’s Seneca Park Zoo —“no venomous snakes in the home” was a long-standing rule. At the conclusion of the trip, Roger Conant encouraged me to publish a range extension I had discovered (*Herpetologica*, 1960).

Salamanders from New York were popular in Germany at the time. I developed a packaging technique that guaranteed safe transit for living amphibians through international mail (many years later I used the same technique to mail frogs from Spain to Jack Fouquette at Arizona State University for sperm morphology research). As my exchange collection grew, I moved from the ground floor living area of our 1940s style Cape Cod house to attic spaces that my father had earlier converted into a heated hallway and a 300+ square foot bedroom—one wall of bookcases accommodated my growing library; larger custom-made

glass-fronted cages (grandfather was a carpenter) lined one side of the hallway, and crickets and mealworms were raised in a “secret” space behind the hallway wall. My brother later moved back to our original downstairs bedroom after my Boa Constrictor sought warmth in a dresser drawer after finding her cage accidentally left unlocked.

During my high school sophomore year, I participated in a student exchange program to Panamá. Armed with two years of conversational Spanish, a few cloth collecting bags (expertly double-stitched by grandmother), waterproof ink and paper, and a lot of enthusiasm, I was off to experience the jungles of Latin America! The first few days included orientation to life in Panamá, a cruise on the Canal, and a visit to Panamá Viejo (*Ctenosaura similis* were memorable), and soon I was off to meet my adoptive family in Los Santos for a three-month stay in “the interior.” Rather than attend local high school classes, I chose to pass the summer exploring, and soon met several Panamanians who “adopted” and befriended “*el gringo*” almost instantly. Los Santos, situated in premontane dry forest, was first somewhat of a disappointment (where’s the jungle?), but I eventually discovered that walking dirt trails after sunset could be productive — add a little rain and the “world” really livened up. I learned early on that temporary water and frogs each disappear quickly as depressions in and along pathways dry out and clouds evaporate. After the initial “shock” of being where little English was spoken and meals were quite different (baked fish, served whole, took a bit of getting used to), I proceeded to assemble a herpetological collection and connect with a local pilot. Mail drops do not provide much ground time, but do provide an overview of the country and an occasional specimen. As with “souvenirs” from subsequent travel, most of this collection (*Copeia*, 1966; *Herpetological Review*, 2018) is housed at Carnegie Museum.

I became a regular entrant in local Science Fairs (never being awarded more than an Honorable Mention), and graduation from high school (1962) earned me the parental gift of a life membership to the American Society of Ichthyologists and Herpetologists. Nevertheless, perhaps related to non-traditional interests, results from various aptitude tests, and achievement assessments (administered locally and through the state education department), neither I, my parents, teachers, nor school administrators could decide what I might best choose as a career goal (when guidance was provided, it most always led to veterinary medicine or zoological parks). College had never been discussed in our home, but many others offered ideas of what might be best for me.

Late in my senior year at high school, I attended a “college fair” event. A Syracuse University recruiter interviewed me at length, and actually (I was shocked) offered me early acceptance. It was then I took my first solid step into a world with which my family was unfamiliar, and put this guaranteed acceptance on hold. By then my library held the Comstock Press’s series detailing New World amphibians and reptiles. I began to look seriously at Cornell University and accepted a tour of the Cornell campus. Cornell’s athletic teams have never been a match for those of Syracuse University, but I wasn’t interested in studying basketball; furthermore, the New York State College of Agriculture at Cornell was both affordable (very important) and offered many of the courses I would later find interesting and useful.

After a great deal of indecision regarding “intelligent” choices of coursework for any future endeavor, I eventually settled on a vertebrate zoology major including a heavy dose of miscellanea. Although mammalogy (J. N. Layne), ichthyology (E. Rainey), and ornithology (D. Lancaster, substituting for C. Sibley) were available, herpetology was never offered while I was there, in spite of the fact that every annual catalogue listed it (I have never had a formal course in herpetology—the closest I came at Cornell was vertebrate natural history

[Conservation 7] that included a section [during the winter] on amphibians and reptiles [mostly of New York] taught by James N. Layne.

Study at the College of Agriculture had as a requirement that each New York State resident have experience doing agriculturally-related work prior to graduation. Pheasants raised (for enhancement of the fall hunting season) at the New York State Game Farm in Ithaca offered me a somewhat unusual opportunity to gain this experience. The night shift position included use of a rent-free bunk house, companionship of an enthusiastic and well-trained Airedale Terrier (Scooter), and local use of a '53 Chevy pickup truck and a vintage but well-maintained shotgun; Scooter and I were charged with defending otherwise helpless fledglings from late-night marauders. Local residents were advised of the danger to pets found in, on, or near the State-managed hardening pens during weeks when pheasants occupied them; between Scooter's alertness, speed, and tenaciousness, and the shotgun, few predators escaped. During the day I was free to exchange engines between my '54 Ford and a '57 Ford purchased at a police vehicle auction for \$50. When the '54 was appropriately re-wired, re-assembled, and tested, I sold the cannibalized '57 vehicle for parts, and used sale proceeds to purchase re-upholstering material. Summers in Ithaca taught me much about dog behavior, shotgun use and maintenance, late night road driving, and automobile mechanics – all skills I have continued to use throughout life.

During high school and between semesters at Cornell, I worked for Star Super Markets (bagging groceries, etc.), American Laundry and Machinery (drill-press operator), Ward's Natural Science Establishment (packing and shipping department), the United States Postal Service (postal carrier), and the New York State Conservation Department. Immediately after graduation from Cornell, Jack McCoy offered me a job at Carnegie Museum, and at the same time apologized for his having only three months of guaranteed salary to offer. But as his family was spending the summer in Oklahoma, his offer also included daily transport to the museum, full-use of his house (including a bathroom with frog-motif), and his expertise as chef. At the museum, I was given free access to the Section's duplicate reprint collection, assigned to remove flesh from skeletons of deteriorating snapping turtles, and provided opportunities to work with him on research projects. A friendship that had begun between us through correspondence during my high school and his college years matured and flourished throughout the rest of Jack's life. When Steve Rogers at Carnegie called to inform me of Jack's death (1993), I left my Oregon office in silence and drove to a nearby lake where I sat in shock and sadness the rest of the afternoon; my voice wavered and tears filled my eyes as a severe sense of loss overcame me once again as I spoke at his memorial service in Pittsburgh.

During my junior year at Cornell, I had taken a language proficiency exam for the U.S. Peace Corps. While I was working at Carnegie Museum, the Corps finally responded with an open-schedule airline ticket from Rochester, N.Y., to Honolulu; Manila; and Bangkok. If I wished to participate in *Thailand XXI* (Malaria Eradication), the letter began, I must be at San Francisco International Airport at the date and time specified. It had been almost two years since I had heard anything from the Peace Corps. I had actually forgotten about that application and exam. Jack and I had a long discussion that evening, and when I asked for his honest opinion Jack replied, "It's an opportunity to see a different world, and it's not every day one gets such an opportunity. We'll miss you, but there will be no hard feelings if you accept this opportunity....", and I went off to Honolulu, and later over to Hilo to spend the summer.

Eight weeks of intense training in the Thai language at the University of Hawaii in Hilo was followed by procedural instruction at World Health Organization facilities in Manila.

Upon arrival in Hilo, we settled into a World War II-era hospital compound and began language training. Greg Ballmer (UC, Riverside), whose interest in myrmecophilous lycaenid butterflies paralleled mine in amphibians and reptiles, and I shared a room. Greg and I spent much of our off-time together, his catching insects, and my chasing whatever herps were available. On weekends we hitchhiked to the Kona Coast, slept openly on the beach, and explored (scorpions in Hawaii, I learned later, are immigrants from southern Europe). We were not allowed to drive but managed to travel over the entire Island during off hours anyway; we enjoyed many, sometimes exhilarating, drives provided by locals and tourists. The Thai language is extremely complex for those whose tongues aren't Thai, and we practiced continually. After a full week most of us managed only to say "Good Morning" and pronounce it correctly. I don't think any of us learned how to read this language with its 44 consonants, 15 vowels that combine to form at least 28 vowel forms, and four tone diacritics, but my final oral exam suggested I had gained the speaking expertise of a two-year old child. A Thai child, of course, goes well beyond that level rather quickly. I did not. For example, the Thai word for snake also means "mother", "rat", and "sergeant" depending upon pronunciation; its first "letters" are phonetic for "ng", pronounced as the "ng" at the end of "singing" once the preceding "s i n g" and "i" are sequentially dropped -- and one must be careful at military checkpoints.

Spaced between language instruction and classes in staying healthy, we were interviewed by psychologists, psychiatrists, and volunteers who had served in Thailand. One does tire of being asked about his relationship with his mother, and his interest in snakes. It was Hawaii, after all, and I admitted to having a certain fascination with lizards (having found two species then new to Hawaii [*Herpetologica*, 1970]), but did not recall seeing any snakes. Results from questionnaires among contemporaries regarding success potential, given weeks apart, associated me in almost equal number with the potential to be both the most successful and the least successful volunteer. So much for keeping a low profile; I was allowed to go to the Philippines for second-tier training, but no one mentioned that I was being closely monitored.

Evenings and weekends in Manila represented free time. Greg and I explored Luzon on foot as much as we could. We walked through neighborhoods stopping at lighted shop windows and lampposts and investigated public parks, eventually hitching rides on trucks going "to the mountains" on weekends. At Makiling Mountain, we were granted use of the guest house (University of the Philippines, Los Baños campus) during our weekend visits. On our first hike, I found the highly-secretive Spiny Waterside Skink (*Tropidophorus grayi*) partially submerged in a stream, and was truly surprised! Who looks for lizards in flowing streams? My choice to accept the Peace Corps' offer was already beginning to look very rewarding on many levels.

When the selection of volunteers for the Thailand project was finalized, I was called in to discuss my flight options for return to the U.S. Although I had done well in training, there remained a lingering uncertainty concerning my suitability and I was "de-selected." I had apparently been tentatively selected to serve as the Peace Corps' sole representative in Songkhla, close to the Malayan border, but as the Thai people have a deep respect for all life and rather than being a positive representative of the United States, it was decided I would likely become that strange American who spends his spare time chasing lizards. (Well, perhaps. I had built a small herpetological collection in Hawaii and the Philippines).

Soon after my return home, I began writing letters in search of employment. James N. Layne was now Director at the American Museum's Archbold Biological Station in Lake Placid, Florida. I immediately accepted his offer to serve as laboratory assistant. One of my

first assignments was preparing a skull and study skin from an otter having been shot by a farmer and left to sink to the bottom of a farm pond; after it floated up to the surface, I was asked to use the outside deck as I prepared it as a study skin and skull (*déjà vu* first day at Carnegie). But I had arrived in Florida in early December, far from the blizzards of New York, and soon began to feel at home. I worked with Dr. Layne on comparative physiology of Deer Mice (*Peromyscus floridanus* and *P. gossypinus*), homing in the Gopher Tortoise (*Gopherus polyphemus*), and biology of the Florida Scrub lizard (*Sceloporus woodi*). At the same time, on Layne's recommendation, I began to consider graduate school, and gathered pertinent information from the University of South Florida.

Meanwhile, the war in Vietnam was heating up. The U.S. Congress had authorized the Department of Defense to increase military draft quotas (1968) and, for the first time ever, the U.S. Marine Corps was authorized to draft. In February of 1968, I received a draft notice and was given until the end of March to become affiliated with an active duty unit of the U. S. military; my tenure with Archbold came to an abrupt end. The U.S. Air Force, Coast Guard, and Navy had no problem filling vacancies, and as my family background was Navy, I hoped to find an opening I might fill. Four years as a Navy enlistee, in place of two years as a Marine or Army draftee, sounded like a decent alternative — but every East Coast Naval district from Florida to New York was then booked solid for months, and when I finally returned to Rochester, I asked a local Navy recruiter to put me on his "waiting list." He was not encouraging, but he recommended I take the military entrance exams (written and physical) while he explored my options. A few days later he called, told me he had reviewed my exam results, and asked if I'd like the billet previously assigned to a volunteer who had been diagnosed with severe appendicitis the previous night! And with that major stroke of luck (only for me of course), my life (and future research interests) became focused on the Old World.

The U.S. Atlantic Submarine fleet had six nuclear submarines and two submarine tenders deployed in Europe in 1968. After basic training in North Chicago, I was assigned to the USS Holland (crew of 1,500) as it was being repaired and upgraded in Charleston, SC. I had heard rumors before actually reporting to the ship that it would be going to Spain (Naval Base Rota) to relieve the tender currently there, and I asked Jack McCoy to see what I might find in Spain. "There's a biological station in Seville, but I can't find much on the area's fauna" was his general reply. I recall being more enthusiastic about being really close to Africa than to being in Spain. Herpetologically speaking, Europe, home to many prominent herpetologists throughout history, would likely not offer much in the area of new discoveries.

On the first day aboard ship, the Personnel Officer gave every previously un-rated assignee what could best be called a sales pitch. College graduates who could type could agree to work for him and be guaranteed freedom from scraping and painting (The ship was not in the water at the time, and it measured a massive 599 feet in length.), washing dishes, or serving on work parties. Neither newly-arrived Bill Maxwell nor I could resist such an offer. Bill and I became friends as we worked side by side, day and night in the Personnel Office processing paperwork for about 800 sailors and their families, slowly adjusting to our greatly changed lives. Among those arriving on board were electrical engineers, metal workers, carpenters, photographers, physicians, medical technicians, and postal clerks — all persons whom I would eventually get to know and call upon from time to time for assistance and advice above and beyond the call of duty. Perhaps most unexpected was the close relationship I was able to establish and maintain with medical personnel. As there was a bacteriology laboratory at the Base hospital, the ship's laboratory lay dormant. The officers in

charge of the medical spaces (operating room, recovery room, etc.) eventually entrusted me to use and properly care for various under-utilized spaces. I was the only non-medical person on board with a key to the ship's bacteriology laboratory (refrigerator, freezer, etc. included) during my entire tour of duty; eventually, this laboratory became my personal preparation and collection storage area. Storage vessels, shipping materials, and formalin-preserved specimens were soon housed in secure, unlighted, air-conditioned cabinets until the volume of material, or the ship's leaving port, precipitated permanent transfer to Carnegie Museum or to the U.S. National Museum.

The first voyage for this newly-assembled crew ended at Guantanamo Bay. During the week's non-duty hours in Cuba, wearing my dress white uniform (required for leaving the ship), I surveyed non-security areas (I truly could "handle the truth" [after Jack Nicholson in *A Few Good Men*]) and honed my skills immobilizing lizards (*Leiocephalus carinatus*) using a rubber band technique demonstrated earlier by Jack McCoy. Several personnel on the ship's bridge, apparently having learned of this activity, announced over the ship's internal communication system our passing Lizard Island (Exuma, Bahamas) as we cruised back to Charleston (a ship is a small village, observations travel fast). Before leaving Charleston, I had become acquainted with several additional crew members who were curious regarding what, exactly, I did with these creatures after I captured them, and many later became specimen donors, eager to know what their child (or they) had seen or found after our arrival in Rota. My on-board library consisted only of Merten's (1960) *Die Amphibian und Reptilien Europas* and Hellmich's (1962) *Reptiles and Amphibians of Europe*, and from those two volumes (supplemented by preliminary identifications provided by McCoy as my collections arrived in Pittsburgh), I gradually developed a modicum of knowledge regarding southern Spain's herpetofauna.

We crossed to Europe during a calm and warm March. I charted our progress on a National Geographic map of the Atlantic Ocean attached to the wall next to my Personnel Office desk; free room and board, laundry service, entertainment, all included – I thoroughly enjoyed the all-expenses-paid ocean cruise and sometimes rolled my desk chair onto the outer deck to take in the view, always impressed by the expansiveness of the ocean surrounding us. We stopped in Amsterdam (the ship was the "Holland" after all [?]) and anchored in Lisbon's harbor before going over to Spain. Wall lizards (*Podarcis*) darting across stonework surrounding the Moorish castle São Jorge, coupled with the view of the Tagus River and Lisbon's historic center, changed my earlier impressions of Europe. Lizards active in city centers during March was certainly a novelty after life in Rochester. After we had docked at the Rota Naval Base, I could see Morocco most mornings as I stood on deck during quarters. For almost three continuous years, I would be assigned to a ship that rarely left port!

Almost immediately upon arrival in Spain, I emptied my U.S. savings account and purchased a VW. Rainy evenings and sunny days soon lured me into the countryside. I had my camping gear shipped to Rota and began exploring Andalucía. When I wandered too far to return to the ship without wasting valuable field time, or needed to be out before sunrise, I simply set up camp and did some road driving in the area after dark. Initially I explored Cádiz Province to become familiar with its ecosystems and herpetofauna — quite unlike New York's or that of any other place I had visited. I "fell in love" with Spain, its people, its culture (especially the pageantry of the *corrida*), and its herpetofauna. As all of my field work was self-financed, and I was reliant solely upon a monthly Navy salary (~\$137), I lived aboard the ship or in my tent. Vehicle finance charges and fuel were my most prominent expenses and occasional weekend trips to Sevilla, Granada, or Lisbon were affordable.

By my first full spring in Spain, I had become familiar with plant species by photographing leaf and flower configurations of the most common ones. Specimens were desiccated (automobile interiors make a perfect furnace) in a "home-made" plant press and resulting museum specimens were identified by Dr. W. E. Dress at Cornell University's Herbarium. My off-duty activities included monitoring amphibian migration activity and generally recording herpetological species occurrence throughout Cádiz Province. As there were few representatives of southern European amphibians and reptiles in U.S. museums, I collected specimens extensively, striving to obtain adequate monthly examples of both sexes of each species, hoping to eventually gather sufficient data from which to prepare an extensive report on the biology of each species. At the time I considered myself a directed, disciplined field biologist, but Bill Maxwell and his wife labeled me a "monomaniacal obsessive" after I answered a dinner invitation with "...sure, unless it's raining." It was early fall, amphibian movement is triggered by rain, and it appeared as though the rains would begin very soon. After I explained this, Bill looked at me and asked "You want me to tell my wife that? Unless it's raining?" From that day forward dinner invitations were offered with "...as long as it's not raining of course."

Although Franco's Guardia Civil patrolled the province extensively by vehicle and on foot, we met only twice during my three years in southern Spain. Our first meeting resulted from my being along coastal Cádiz "in the middle of the night." I had carried my tape recorder into coastal wetlands close to the Trafalgar lighthouse to record chorusing *Hyla meridionalis*. Wearing dungarees, with tennis shoes my only footwear, I occasionally misjudged water depth and left the wetlands muddy and soaked up to the waist. As I returned to the roadway and walked toward my car, I noticed a dazzling array of flashing lights in the area where I had parked. Not thinking about smuggling activity between Morocco and Spain, I was curious but unconcerned as I came close enough to identify Guardia Civil vehicles as those surrounding the car. Nonchalantly placing the tape recorder on the passenger seat, I prepared to start the car when the lead officer interrupted and asked "Is this your car?" VWs were rare in this part of Spain, mine carried a Madrid registration, it was really late, and I was dirty and wet. When satisfied I was not a smuggler he apologized for the intrusion, explained the problem, and asked what I had been doing in the marshes. I retrieved the tape recorder, rewound a bit of the tape, and turned it on. First incredulous (possibly a bit angry), he began laughing and invited his colleagues to come and listen. I explained what they were listening to, apologized for the inconvenience, and was asked to announce my visits in advance the next time I intended to be on the beaches at night. Released without further incident, I was mindful, and a bit more thoughtful, when planning to be out along the coast at night.

During their next visit, I was camping without permission on city of Sanlúcar de Barrameda property where I had begun a lizard study (Who knew? There were no fences or property signs in the area.). After breakfast, not being bothered by mosquitoes, I was breaking camp as the pair approached. I explained what I was doing there. They advised me I would need written permission from the magistrate to continue these activities. Having no idea of who, what, or where the magistrate might be, I simply wrote down the name of the person from whom I must obtain this permission. One of the two individuals, literally covered in mosquitoes while I was shirtless and unbothered, pointed to my mosquito-free upper body, and asked why I was not as covered as they were. I reached into the car for my aerosol can of Off™, demonstrated its application, and gave each officer a fresh can indicating that if they needed more they could simply ask the next time we met. Later that morning, I located and met the Magistrate for Sanlúcar de Barrameda (also the patriarch of

the Hidalgo family, producers of the world-renowned sherry “La Gitana”). He drafted a permission statement and wrote it on the back of his business card as we discussed the beauty of those little green treefrogs. I was invited to his home for dinner the following Sunday. Luis Hidalgo and I remained friends until his passing in the late 1980s.

Two years was standard for a sea duty assignment (and being assigned to a ship that rarely leaves port was considered sea duty). Halfway through my tour of duty, I initiated what was to become a comparative study between ecologies of two lizard species that co-occurred in two distinct habitat types. One late night in the office, I was reminded by Bill Maxwell that my requirement of a year's worth of data could not be met because I had less than a year remaining in Spain. Bill remained bemused as I presented my seemingly bizarre solution to this problem: shortly before transfer orders were actually issued, I would request an extension of my current assignment citing three truths. I would explain to the Chief of Naval Personnel that a transfer would be needlessly costly as 1) although I was very well-adjusted to, and my work respected by authorities at, my current duty station, I would not be re-enlisting; 2) I had enlisted local residents and fellow co-workers as volunteer field assistants, worked with Public Health personnel, and been featured by the local Base newspaper and the European edition of the U. S. Armed Forces' "Stars and Stripes" newspaper for my off-base activities, and 3) unfinished research projects involving both U.S. and Spanish biologists required a greater time investment. I closed by emphasizing cooperation with academic institutions in the U.S. (ASU and Cornell in particular, Carnegie Museum, and the U.S. National Museum), all of which could serve to validate my efforts. Before leaving for Washington, the request was approved and strongly recommended by my executive officer (an avid birder), and approved by the ship's commanding officer. A few weeks later, Bill and I were equally surprised when the Chief of Naval Personnel granted my request. I remained on the ship and was transferred from the main Personnel Office to the ship's office of the career counselor. Maxwell declared at the time I was the luckiest person he had ever met. I could not disagree.

During 1971, I continued general survey work, began collaborating with F. Harvey Pough (then at Cornell) on a laboratory analysis of metabolism and activity in *Acanthodactylus* (spiny-footed lizard), and seriously began planning an extended excursion into Morocco. Co-workers and I had previously visited only Tanger and Rabat on weekend trips, but now I wanted to explore Morocco and needed to find a companion for whom camping throughout Morocco and searching for reptiles might hold some interest, and for whom a 30-day absence from home would not pose too much of a problem. I asked my father if he would be at all interested, but when he suggested only July would work for him, I was quite disappointed at first. But July was better than not at all, and I began working toward arranging a 30-day leave from Navy responsibilities. My immediate supervisor's first response was "No, too long. There is no trained substitute on board who can actually do your job". Rather than argue against my importance, I suggested a compromise — I would instruct a temporary replacement in the more complex of my responsibilities, and I would personally complete all paperwork necessary for the month's required crew training and re-enlistments. Aside from required signatures, he would have the completed paperwork for the month's known obligations on his desk before I left. Incredulous, he said I could not possibly do this, but he agreed to let me try and we shook hands on the deal. Without missing a single scheduled field day, I completed my end of the bargain, and my VW squareback was equipped for a month in the field as we left Algeciras bound for Tanger. From my standpoint the trip was a complete success (see Busack, 1973 for a narrative, and Busack et al., 2015 for a noteworthy discovery later found buried within my field notes), but when my father

returned home he reportedly echoed the Maxwells in using the word "obsessive" in his recounting of our adventure.

As 1972 and my release from active duty became imminent, I dismantled the laboratory and field operation and, with Robert Tuck at USNM, began planning a trip through Mediterranean Europe. Soon after January, however, a newly-issued Spanish regulation prohibited vehicles owned by U.S. military personnel to be registered as tourist vehicles through a simple conversion. This single action rendered our easy access to ground transportation moot and forced me to cancel these plans. I had already delivered my car to the contractor that would ship it to Charleston when McCoy asked if I would consider participating in the Tunisian Presaharan Project of the U.S. International Biological Program. A herpetologist was needed, and as I was "seasoned" and "just around the corner," Jack offered to pay my airfare from Spain to Tunis and, upon project completion, to anywhere in Europe. I was to be provided accommodation in Gabès, have access to a vehicle, and receive per diem in local currency at the rate authorized by the U.S. government (excess currency funds). Aside from possibly returning to Archbold (as a draftee I was, by law, guaranteed a position at the place of previous employment when released from military service), I had no real plans. Layne offered a position as station librarian should I decide to return, but I decided instead to visit Tunisia.

Jon Ghiselin, a mammalogist at Lycoming College (Williamsport, PA), was already in Gabès. Scientific Director Georges Novikoff delivered me to the station and provided tickets for first-class passage on what turned out to be the local train from Tunis to points south. At every stop, we discharged and boarded passengers and assorted farm animals (mobility-impaired chickens were popular). We came to an abrupt stop about an hour south of Tunis, the interior of the train became uncomfortably warm, and I speak no Arabic. In fear of losing my seat should I leave it unoccupied, I remained on board and continued reading Michener's "Caravans" as a quasi-introduction to what might lie ahead. I never learned what caused the lengthy stop.

By the time the train arrived in Gabès, it was late, almost dark, and the station was empty except for the attendant who indicated it was closed. I sat on the platform watching the entrance road for any sign of activity, and when none appeared after an hour I began walking toward city lights (How difficult can it be to find one American in a Tunisian coastal town?). A short walk later I met Ghiselin, on foot, on the street ahead. He explained he had been having trouble starting the Land Rover (what, no taxis?). The next morning we had a conversation regarding what he expected would be my responsibilities. Nothing approaching his perceived volume or variety of responsibility had been mentioned in any correspondence I had received. Nor did anybody mention that driving the U.S. Government (Smithsonian Sorting Center) vehicle assigned to the project would require a government driver's license. Had I known this in advance, I could easily have obtained one. I produced the notification-free original copy of my written agreement to end the argument. By the end of week one, I had ventured far enough out on foot to locate the local butcher and fresh fruit and vegetable market, days and hours of operation, and when fresh chicken or beef would be featured. My first encounter with beef involved approaching a freshly hanging carcass and outlining how I wanted it butchered; in anticipation of the rapidly arriving summer, as we had a freezer, I purchased a supply sufficient to supplement our weekly rice for about a month. Chickens were easier to deal with.

By the second month, Jon and I had worked out a vehicle use schedule — traps set in the evening were checked the following morning and, after returning to the villa so mammal

specimens could be promptly attended to by Jon and his Tunisian assistant, I began exploring the area. Among the most memorable encounters are an adult male Desert Monitor lizard (*Varanus griseus*) whose hissing from just below the soil's surface gave him away, and three Egyptian Cobras (*Naja haje*) encountered north of Ghannouch among stabilized dunes bordering the Gulf of Gabès. By late May, I had completed validation site and surrounding area surveys as originally agreed, and I left Gabès for a visit to Phoenician Carthage and later on to London.

Alice Grandison, Nick Arnold, and Tony Russell at the British Museum of Natural History welcomed me and were congenial and helpful as I recorded data from Iberian False Smooth Snakes (*Macroprotodon*) in the Museum's extensive collection. Financially limited in expensive London, I boarded in Ruislip with a former colleague, then assigned to the office of the naval attaché, and commuted between the two locations using the "tube." After completing data taking, I moved on to Frankfurt where a "space available, no cost" flight to the U.S. and on to Rochester would be available from Rhein-Main Air Force Base. Frankfurt, I soon discovered, is also expensive, and by then I was almost out of money. Rather than work at the Senckenberg Museum and stay in town, I asked that the necessary specimens be loaned after I had a suitable museum address back home (Carnegie Museum being what I had in mind).

I landed in Charleston on July 3rd, just in time to clear military customs and catch a late commercial "space available" flight up to Washington, D.C., but would be stranded there until the 6th unless a seat opened up on a flight to Buffalo or Rochester before then. Bill Maxwell and I had remained close friends (although it was during the rainy season, I loaned him my car for the week prior to his leaving Spain), and he was at this time serving out his enlistment at Fort Meade, MD. Remembering this, I issued a plea for help: "I wouldn't pick up my mother at National airport" was his initial answer, followed by "Traffic's heavy, but I should be there in about an hour." We reminisced, I slept on the couch, and the next regular work day drove his car into D.C. and visited the National Museum.

Upon entering the Division of Amphibians and Reptiles, I was first met by Bob Tuck who greeted me with "I thought you were still in Europe" and guided me to the office of divisional curator James A. Peters, with whom I had been corresponding, and later to George Zug. That morning Bruce Bury, recently selected herpetologist for the Bird and Mammal Laboratory of the Bureau of Sport Fisheries and Wildlife, U. S. Department of the Interior (see Lovich et al., 2012), and I also met face to face. Bruce and I had corresponded and traded herps several years earlier, but lived thousands of miles apart and had never actually met. I became most interested in the newly-created, but as yet unfilled, position that probably would become available in the fall (government funding is always an issue). Later that same day, I spoke with Richard C. Banks, then laboratory director, and Dr. Banks stressed that the position would not be a research position, per se, but rather a full-time technical support position. After a cordial and very informative conversation, I continued to express interest, and was introduced to the application procedure.

I returned to Rochester, accepted McCoy's offer to visit Carnegie and, as positions in herpetology are notoriously uncommon, he suggested I seriously consider the technician position. I remember being concerned that I might not be considered qualified and asked if he would support my listing the work in Spain and Tunisia as representing one full year of technical experience — he chuckled, and said "Yes, I think you could reasonably say that." Although new to the workings of science in government, I was not at all surprised that positions in research were reserved for those holding PhDs. Having already served as a

technical assistant at Carnegie and Archbold, I actually found this opportunity to be "perfect" for me. The 300 pages of fieldnotes (coupled with a substantial museum collection) I had gathered overseas lay dormant. Being at the National Museum would allow easy access to the nation's best herpetological library, three professional herpetologists from whom I could continue to learn, and access to a massive worldwide collection of amphibians and reptiles. This was far more than I ever imagined growing up; as a bonus my Navy time, along with that from the U.S. Postal Service, would be credited toward eventual retirement benefits. I was mentally in D.C. well before I was actually offered the position.

My first assignment after arrival in D.C. was to organize and prepare a report (using documents [Forms 3-177] stored in "the attic"), detailing amphibians and reptiles imported into the U.S. for the years 1970 and 1971. These forms had remained as received from Ports of Entry; duplicates were not rare, and identifying synonymous or fabricated species names ("Snakeo snakeous" remains my favorite) appearing on approved documents required expertise I had not yet acquired. Ronald I. Crombie, then with the National Zoological Park, graciously identified erroneous entries on my initial listing. The final version, without the list of importers, became Wildlife Leaflet 506 (1974: 36 pages). From time to time, I was asked by USFWS Law Enforcement to identify reptile (rarely amphibian) species from which some items (clothing and jewelry mostly) were made; major issues were turtle shell and snake and crocodilian leather. When partitioned, snake and crocodilian skins are difficult to identify beyond genus. Bruce assigned me the task of investigating possible identification procedures. After researching the literature, it became obvious that this would not be an easy task (depending upon the item, perhaps not possible at all), but without the ability to actually visit collections with extensive holdings, gathering sufficient reference specimens would be difficult, and money (always) would be a problem. Internal politics essentially shut down this project before it actually got started.

But while I was preparing the imports report, Bruce's request for funding in support of an investigation of off-road vehicle damage to the Mojave Desert was approved by World Wildlife Fund (Project US 19), and we began preparing for an early Spring visit. In an effort to conserve WWF and Department of the Interior funds, Bruce decided to use his personally-owned, well-travelled, and older four-wheel drive Dodge Power Wagon. Once having attached the chain from a Land Rover's winch to the frame of a rented VW Beetle to successfully dislodge the Land Rover from the mud in which it had become mired, I insisted that my personal VW accompany us. Bruce agreed, and I had a towing bar manufactured specifically for the VW. Ronald W. Marlow, then a graduate student at U.C., Berkeley, had a small camping trailer parked in the desert, not far from California City, that would serve as home base during the field work and, as I intended to visit California after the research trip concluded, I packed my camping gear into the VW.

Just before we left, Bruce required surgical attention and elected to have it performed in his home state of California (after his mandated recovery period, he would join Marlow and me in the desert). I left Washington driving the massive Dodge with VW attached, camping at state or local parks as I headed west, and all went well until I crossed into Alabama. The power wagon began performing poorly, and I stopped at a shop advertising truck repair just outside of Selma. I watched as the mechanic removed and disassembled the transfer case, sorting components into two piles, and asked what the piles represented. He placed two seemingly identical parts side by side on the bench in front of me, indicated "This is serviceable, this is not," and I could clearly see the difference. Impressive, but not particularly good news as the bad substantially outweighed the good, and the transfer case

had to be rebuilt or replaced. I un-hitched my VW and camped at a local park to wait as the shop searched for a similar model that could be cannibalized; two days later I was told no replacement could be found but that it might be possible for Chrysler to manufacture a transfer case using blueprints for this now-discontinued model. This, of course, could take months. Bruce accepted this solution, and we agreed that I should continue to California using the towed VW. I admit I was not displeased with this solution, broke camp, transferred the field gear (and tow bar) from the disabled power wagon to my VW squareback, and continued west. (The power wagon was finally re-assembled later that fall).

The desert comes truly alive following rain and provides an artist's palette of color. As I drove among butterflies between mountains and desert along U.S. 40 toward Barstow, the landscape was spectacular, varied and beautiful. I soon crossed the dry creek bed separating paved roadway from Marlow's trailer site, and later met Ron and Kristin H. Berry. Dr. Robert Stebbins (U.C., Berkeley) accompanied his herpetology class to Ron's trailer site on one occasion, and he and I discussed indiscriminate use of the desert for off-road vehicle recreation during his visit. I deferred to Stebbins' seniority and slept in my tent during his visit but returned to the trailer later that week after Ron, early one morning, disturbed a Mojave Rattlesnake close to where I had set up the tent. On my way into town for grocery shopping early one afternoon, I stopped to take photographs of a Mojave Rattlesnake in the same general area, and when I returned a couple hours later I captured a photographic series of a Kingsnake feeding upon that rattlesnake. It was disappointing not to have observed the opening sequence of this event, of course, but at least I had been able to watch and photograph this unstaged encounter between the two species. Nature can truly be fascinating!

We returned twice to the desert to study off-road vehicle damage during my tenure with the Laboratory, and I accompanied Bruce during Pacific Pond Turtle research in northern California. I was charged with logistical support, organization, execution, data analysis and manuscript preparation following the first trip (1973), and was quite surprised when I received a Superior Achievement Award in 1974 for my performance during that trip. Bruce later asked me to "put something together" about the Black Toad (*Anaxyrus exsul*) for the readership of National Parks and Conservation Magazine (1975). I also participated in field work and report preparation required for later desert studies but, in general, assumed a lesser role as research assistant and a greater role in routine museum activities following Bruce's transfer to a new field station established in Fort Collins, Colorado. Shortly following Bruce's departure, I was transferred to the Mammal section of the (then) National Fish and Wildlife Laboratory and continued working as needed in the Division of Amphibians and Reptiles until my resignation in 1978. One of my assignments was to try to recover out of date loans. Most researchers require only a single reminder, but one loan in particular was almost two decades overdue. After determining that researcher death was not involved, and with curatorial authorization, I marked my calendar and prepared a letter demanding specimen return within 30 days. Upon expiration of the 30 day limit, I followed up with a simple declarative letter stating that the material in question was the property of the U.S. government, and theft of government property was punishable by law and could involve the F.B.I. The specimens were returned soon after.

During my first year in Washington, USNM curator James A. Peters succumbed to liver cancer. I worked with George Zug during the sale of Peters's library. I answered correspondence, curated bids, maintained accounts, managed prompt distribution of auctioned books, and periodically forwarded payment to the Peters family. Local field work in Maryland, Washington, D. C., and New York (April 1977 with Margaret M. Stewart,

during a preliminary interview regarding graduate school), West Virginia, and Virginia was only occasional. Jane S. Peters, because she had never been there, and I, because it was the only section of Spain I had not yet seen, visited northwestern Spain in 1975. The Gold-striped Salamander (*Chioglossa lusitanica*), a species externally resembling our Red-backed Salamander that I had never seen in the wild, was my "target" species and, upon returning home I collated personal observations with those available in the literature, and published a summary report (1976) on the biology of this species.

During late 1976, Jeanne A. Visnaw, a library technician with the Natural History Museum, and I became friends, and by summer 1977, we had begun dating. In July of 1977, we took a camping/collecting vacation together through North and South Dakota, Wyoming, Montana, and Idaho, visiting parts of the U.S. mostly unseen by either of us. Jeanne and I later married and remained and worked together until her death from ovarian cancer in 2005.

Jack McCoy first applied, then withdrew, his application for the vacant curator position following Peters' death. I was disappointed but understood his decision to remain well-positioned at Carnegie as "a big fish in a small pond rather than a small fish in a large pond." Our relationship flourished, and during Carnegie's program of supporting international visitors, I welcomed herpetologists from Mexico, Spain, and India to my apartment during their visits to the USNM. Alfredo Salvador and I first met in person as a result of Carnegie's program, and Darrel Frost, then at the University of Kansas, first turned down, then later accepted my offer of free room and board after shopping local hotels. A female Indian graduate student was the only visitor I recall who was not particularly happy with this arrangement. Apparently she either did not understand, or was not told, that I lived alone. To accommodate her as best I could, I provided, as I did most of my guests, the master bedroom (with a locking door) and explained how to lock the bathroom door and operate the fixtures. I slept on the convertible sofa in the living room during the week of her visit, but she never really seemed comfortable with the arrangement.

Ron Crombie and I visited the Swan Islands (Honduras; see Losos 2012), but I generally worked weekends in the division library when not in California's Mojave, first preparing a comprehensive file on research regarding amphibians and reptiles in Spain and Morocco as listed, beginning with 1864, in the Zoological Record. I resurfaced what once served as McCoy's dining room table as an apartment-suitable laboratory table, visited Carnegie Museum to borrow specimens when necessary, and examined the Iberian False Smooth Snakes housed in U.S. museums. During one family Thanksgiving at my brother's home in Monica, PA, I slipped over to Pittsburgh to pick up a "bucket full" of Spanish terrapins (*Mauremys*) for later examination; neither McCoy nor I ever visited each other without transporting specimens. To facilitate statistical analyses, I purchased a Hewlett-Packard 67 programmable calculator and learned to write programs for procedures not generally available elsewhere. At home during the evenings, I organized and prepared for publication the herpetofaunal synthesis I envisioned while working in Spain. F. Harvey Pough and I completed our study on activity and metabolism of the Fringe-footed lizard (*Acanthodactylus* [1978]), and Howard W. Campbell and I published our chapter (6. Laboratory Maintenance) for *Turtles: Perspectives and Research* (1979).

George Zug and I began collaboration on a study of tadpole development in *Pelobates* (Spadefoot frogs), and Carl H. Ernst and I often chatted during Saturday morning visits. I was alone and using the light table in the rear of the library one morning in mid-1975 when Carl saw the pile of maps and graphs I had lying next to the table and asked what I was up to. I explained the project, the extent of my data, and further noted that although I could write at

home the light table was necessary for producing maps. When I told him my ultimate goal was to publish this work in the Carnegie Museum Annals he asked "Why not use it for academic credit? You should really think about getting a Master's Degree." At the time I was concerned only with publishing the data I had available, my undergraduate record was less than stellar, and I really could not afford to stop working to pursue an advanced degree. He left saying, simply "Think about it. We have an evening program at Mason and I'm sure we can find a way to get you enrolled." I thought about it; financial aid was not an option and, because I lived in Maryland, out-of-state tuition was required. I had a moderate rent, utilities-included, top-floor, one bedroom apartment bordering Sligo Creek Park in Silver Spring, MD. The bedroom was large enough for a small laboratory setup, and two other Laboratory employees (one with a designated parking space) drove by each workday on their way into D.C.; I decided to stay put. Upon registration at George Mason, I qualified for the G.I. Bill, which I then viewed as reasonable restitution for having had my former life interrupted.

In September 1975, I registered as a non-degree (probationary, actually) student at George Mason University in Fairfax. Evening classes required a less-than-pleasant commute into Virginia from downtown D.C. during rush hour that, in my non-air conditioned VW, I found tedious and downright uncomfortable during non-winter days, but I thoroughly enjoyed the university experience. In January 1976, I converted to degree status, and in June 1977 passed the comprehensive (oral) exam. During one of our Saturday morning visits, Carl and I discussed *Mauremys* (Pond Turtles), and he and I initiated a study of variation among European and North African populations. I had by this time completed much of the Cádiz manuscript, and we borrowed all the *Mauremys* available from other U.S. museums. Jeanne and I spent many Saturdays measuring USNM and CM specimens before the other loans began accumulating. My M.S. degree was awarded in January 1978, a few months following Carnegie's publication of my thesis (the Cádiz Province zoogeographic analysis).

Dave Wake visited the Museum while I was still assigned to the division and working toward completing the M.S. Our conversation touched on my future plans and he recommended I seriously consider Berkeley should I decide to pursue a Ph.D., cautioning that he would not have an opening in his program until 1978. I was surprised by his encouragement, but began thinking perhaps I might actually qualify for a Ph.D. program. I interviewed at Cornell and Albany State University much later, but for financial and other reasons, decided against submitting an application. Eventually, knowing I would have to resign my position with the U.S. Fish and Wildlife Service in order to attend, I applied to the University of Kansas and the University of California. Jack, Carl, and George were very encouraging, but my brother thought I'd have to be crazy, and my father — a long-term government employee — among other less than supportive directives, said I'd be "just plain stupid" to throw away 10 years of Federal service. I was hardly despondent, but not happy with my current position and continued to consider other options within the Department of the Interior. I continued working on weekends and evenings, although on a reduced schedule, with *Mauremys* and other projects.

As time approached for graduate school admissions announcements, Jeanne and I began to talk seriously about a future together. Having recently maneuvered through the legal system acting as my own attorney during a relatively simple divorce from a post-military, brief and stressful marriage, I was not amenable to another marriage. I had, essentially, nothing positive to offer; if accepted for graduate school I would resign my position and move west. Jeanne had struggled with financial issues during childhood and had only recently found a position with Smithsonian Libraries; leaving that position would again place her in a

tenuous position as neither of us had any reliable family financial assistance available, and failure was always a possibility. To make matters more difficult, earlier that year the owners of the apartment building in which we lived had announced their decision to convert to condominiums; only two months remained for us to decide whether to buy in or move out as we continued to consider options on a much abbreviated schedule.

William E. Duellman was first to respond to my graduate school application. Without any indication of what might follow should I say "yes," he asked "If I accept you, will you come?" I was stunned. My answer would have to be immediate, no time to ask questions, or think about it. Having immediately recalled a graduate teaching assistant at Cornell who worked at a local service station in order to pay his rent, I had only one appropriate answer... "No." I was disappointed, but not devastated, and Jeanne, probably relieved, later expressed concern for what might happen next. It was somewhat noisy in the mammal division when Dave Wake's call came in, and I had difficulty clearly hearing his offer at first. When all my questions were answered, I was truly astounded (me?), and so excited I could hardly believe what I had just heard. The Museum of Vertebrate Zoology had agreed to accept me into its Ph.D. program, hire me to manage the herpetology laboratory on a half-time basis (guaranteed for 5 years - standard for Ph.D. students at that time), and at a salary almost equivalent to my current full time salary! All of that evening, and the balance of the week, Jeanne and I discussed options, possible benefits and problems (her health insurance being a major issue). After a week of discussion Jeanne decided to resign her position and accompany me to the Golden State.

When I moved to D.C., I had borrowed my brother's van; by the time I later moved to Silver Spring, I required two trips with a small U-Haul, but this move would require actual planning. Upon learning that movers charged by distance and weight (not volume), I purchased a 1967 Ford Falcon van. A week prior to "mandatory apartment vacancy day," Blair Hedges and I moved everything that would not fit in either the van or the VW to the moving company's storage facility. My library and fragile items filled the van and, again using the tow bar, the VW was connected to the van. Jeanne and I spent our last evening in D.C. with George and Pat Zug in the home of Joan Dudley, a Smithsonian volunteer who frequently worked with George. I later learned from Joan that George's impression was that, together, these two vehicles would not successfully complete the trip. His impression was only partly correct in that a replacement tire was required in Nevada, and we had almost reached our final destination in Mount Diablo State Park before a radiator hose failed. We set up camp while waiting for CSAA, and followed as it towed the van to the park exit. At the exit gate, I transferred to the wrecker and Jeanne returned to camp with instructions to return to the gate in two hours should I not return sooner. As anticipated, a replacement hose was not immediately available, I was returned to the gate on that moonless spring night, and Jeanne remarked on the unusually large number of snakes she had seen on the road as she drove down the mountain. As we returned to camp there were, indeed, many snakes on the roadway — rattlesnakes mostly. Our new home was already proving to be much improved over Washington, D.C.

Ted Papenfuss provided the telephone number for an acquaintance who owned Berkeley rental property, and a meeting was arranged at the three-unit property close to campus. Soon after the meeting began I accepted an offer to serve as manager of the building, payment being provided as reduced rent. Jeanne and I were still technically on leave from our former positions pending arrival of our resignation dates, thereby extending medical insurance coverage, and my effective start date at the MVZ was July first. We provided the movers with

our new address, scheduled a tentative delivery date, and took our first camping trip into California's Sierra Nevada. I later advertised the van and sold it (for my initial cost) almost immediately, to a gentleman planning to live in it (we were truly in Berkeley!), and Jeanne filled a vacancy in the University's Zoology Department finance office; our new life had truly begun.

Residents of the northeastern United States view California as a laid-back, no worries, rebellious kind of place; my brother considered it the "land of fruits and nuts." The University of California, however, is not particularly laid-back or rebellious, and Berkeley was known by some residents as a "gourmet ghetto"; in a way my brother's assessment could be construed as being somewhat accurate. Competition is stiff, and the students, faculty, and staff with whom I interacted were serious, intelligent, thoughtful, motivated, well-educated, quite friendly and dedicated. Jeanne and I quickly adjusted to all the San Francisco Bay Area had to offer, never once regretting having made the move.

Literally thousands of uncatalogued salamanders, coupled with numerous other uncatalogued specimens, lined shelves and substantial floor area within the herpetology section of the MVZ when I arrived. I did not have to ask what needed to be done or where to begin. During my last year at USNM, the threat of Richard Highton's massive specimen collection loomed, but his material was bottled by locality, and bottles contained differing reptile and amphibian specimens, providing some variety. These gallon bottles contained only Slender Salamanders (*Batrachoseps*) — long, thin, worm-like vertebrates with tiny legs — from all over California and the Pacific Northwest. To the untrained eye (such as mine) species of *Batrachoseps* could not easily be differentiated by casual external examination, and in some areas more than one species can be encountered. Some species had yet to be named, others required biochemical testing before they could be assigned to a named species. Most of this material had supported Kay Yanev's dissertation research. Kay and I soon became associates as she identified localities where only a single species was found; these (*B. attenuatus*) were catalogued first. Prior to our tying the first permanent number tag to any *Batrachoseps* specimen, Dave Wake held a small ceremony in the lab and opened the series of consecutively numbered museum tags long-reserved for this event. Tying individual tags on each specimen, especially those not yet mature, was tedious and time-consuming, and the process of properly recording only the most northerly ranging species kept us busy for months. When all the *Batrachoseps* were catalogued, there would be Marvalee Wake's caecilians; interesting amphibians I knew about, but have never actually seen in the wild.

Work in the herpetology laboratory (see also Rodríguez-Robles et al., 2003) was woven around course attendance, but I was able to continue working with *Mauremys* and further discuss ideas originating from earlier experiences and observations in Spain. In addition to David and Marvalee Wake, Harry W. Greene, James L. Patton, Thomas Duncan, Paul Licht, Donald O. Straney, Stanley K. Sessions, and numerous others, the level of expertise and experience was vast, and I felt like an underachiever. I was soon introduced to Fabian Jaksić, a student from Chile working in Robert Colwell's lab. He and I had each worked with lizards in areas of Mediterranean climate, and now we shared an educational goal. Our bond was almost instantaneous, and we became both friends and colleagues. Fabian and I later worked together in a seamless and cooperative effort recording and cataloging the *Batrachoseps* backlog.

But I was not at Berkeley to analyze my data from Spain, and there were several exciting projects I could pursue in California. Robert H. Kaplan and I planned to measure individual energy requirements from hatching through metamorphosis in Great Basin Spadefoot (*Spea*

intermontana) tadpoles but, following substantial preparation, my career in physiology ended the morning of our trial run. When my hand and experimental unit came into proximity, the oxygen analyzer indicated substantial changes in dissolved oxygen. Neither Wake nor Kaplan elicited similar responses, and nothing (including my being barefoot and scantily dressed) quelled this unusual reaction when I was involved; I decided to consider other options. I later accompanied James F. Lynch (Smithsonian Environmental Research Center) into Mexico (August 1979) on a salamander seeking trip that began at what is today a UN biosphere reserve where tropical and temperate worlds meet in Tamaulipas State (Rancho del Cielo). It was here I was first introduced to the Rustyhead snake (*Amastridium sapperi*), an uncommon harmless snake having an upper body color resembling that of black sheen velvet, and to the not-so-harmless Totonacan Rattlesnake (*Crotalus totonacus*). One afternoon as Jim and I returned to our quarters an approximately 1.5 meter beauty lay outstretched and unnoticed across the grass-covered trail. Jim's foot came down within 1.5 centimeters of the snake's head and the snake retreated into the high grass, immediately assuming a formidable defensive posture — truly a close call; after photographing this display we continued on our way up to dinner. Jim (an avid birder) was not amused as I reminded him that I had once heard that more ornithologists are bitten by snakes than herpetologists are bitten by birds. Our most exciting find, however, was the Bigfooted salamander (*Chioproteritron magnipes*). This unusually proportioned lungless salamander lives in caves, and today is considered critically endangered due to habitat loss due to logging. My task included being lowered by rope into caves and examining the sometimes exceedingly slick walls in search of this rare salamander. Salamanders inhabiting bromeliads require tree climbing, and although those working regularly in Mexico are cognizant of the fact that poison ivy is found in its temperate forests, I was not expecting it here and climbed, shirtless, up one tree using this ivy as a ladder. Fortunately, anti-histamines are readily available on-demand from Mexican pharmacies.

When it finally came time to settle on a dissertation project, I was introduced to two skink species (*Plestiodon skiltonianus* and *P. gilberti*), presenting both biogeographic and identification problems that might be solved using biochemical (electrophoretic) techniques. This assemblage is widely distributed throughout California, Nevada, and Arizona, and is best collected alive by burying an array of number 10 cans around "skink friendly" areas across its distributional range. Trap-lines established within a reasonably short distance from Berkeley posed little problem, but weekly visits to southern California or into Nevada and Arizona can get expensive. The traps, however, were productive and my preliminary analysis of disjunct populations might identify areas where more concentrated analysis was warranted. Richard D. Sage, extremely patient with most everybody using electrophoresis in the laboratory under his supervision, had taught me the "art" of slicing and staining exceedingly thin layers of starch-based gelatin into sheets resembling fragile, thin-sheet pasta. Further assisted and advised by Monica Frelow, I became conversant with interpretation (and possibilities for misinterpretation) of enzymatic residue left behind as high-voltage direct current attracted or repelled these molecules from finely-blended lizard tissue then saturating tiny squares of filter paper.

After considerable effort (approximately 35 protein systems), I found almost no electrophoretic differentiation between the two skink "morphotypes" historically considered separate species. The larger form (*P. gilberti*) was commonly (but not exclusively) found in more arid and sometimes higher elevation areas than the smaller form (*P. skiltonianus*), but

using the only genetic tool then generally available, I had found no indication of genic differentiation. For me, this suggested it was time to execute Plan B.

As I continued along this original biochemical trajectory, and learned more about the limits and possibilities of the technique, I again began thinking about Spain and Morocco. Go beyond five million years into the past, and the data become difficult to interpret. But in sexually reproducing organisms, if a specific enzyme is distributed as more than one "electromorph" among populations, and differing electromorphs are found in seemingly identical vertebrate populations, reproductive discontinuity is suspected. If a significant number of differing electromorphs is identified between populations, a speciation event may be the cause. The Strait of Gibraltar has been functional for between three and five million years, rendering land masses on either side natural laboratories for the study of evolution in resident amphibians and reptiles. During past associations with this region, many species inhabiting each shore were considered veritable subsets of one another. I wondered how this similarity was maintained in those not able to cross the formidable salt water barrier to exchange genetic material. Question number one was "Are they truly 'subsets' of one another?"

Under the circumstances, Dave was most patient and understanding during discussions regarding my wanting to change dissertation topics. Finances, however, would pose a serious problem. One option — a long shot, actually — was to be awarded a dissertation improvement grant from the National Science Foundation. After my previous experience with "long shots," this was certainly worth an effort, and I prepared an application. To my utter amazement (and delight), the request was approved as seven respondents provided evaluations ranging from excellent and very good to one that was exceptionally negative (my request was apparently the only request funded during that granting cycle). Once again, Jeanne and I had decisions to make.

After I obtained required collection permits, we rented our house to a former MVZ graduate student, and prepared to go overseas. I contacted Luis Hidalgo in Sanlúcar for local assistance, and Jeanne once again resigned her position to accompany me. We arrived during the rainy season, and travelled back and forth between Spain and Morocco every two weeks to experience similar weather on each side. In Spain, we camped for two-week periods at Torre de la Peña (hot showers) because it was secure, shielded somewhat from rain or sun, and because I knew the surrounding countryside well. I was not as familiar with Morocco. We camped initially at Martil, but moved frequently as we searched for specimens. Hot water and other amenities were not as available in Morocco, but we managed to adjust. We carried liquid nitrogen for cryogenic storage of specimen tissue, and refills were easily obtained in Spain as hospitals and veterinary facilities use it, but as we spoke no Arabic and knew no one locally, finding refills in Morocco posed somewhat of a problem. During one shopping trip into Casablanca, I noticed a sign — "English spoken" — on an automobile tire dealership. As Jeanne sat across the street watching the car and enjoying a "sweet tea," I crossed over and, not really thinking clearly, asked to see a telephone book —it, of course, was in Arabic. Embarrassed, I asked about liquid nitrogen. The manager began perusing the directory, copied an entry, and called out to an employee. This gentleman would accompany me to where liquid nitrogen would be available, and would further assist me in obtaining a refill. Astonishing! As we drove through Casablanca car, truck, bus, taxi, horse cart and bicycle (always rush hour) traffic, my guide led us to a sizeable hospital. After refilling the nitrogen tank we returned to the office, thanked my guide (who refused payment) and everybody involved, and set up camp in nearby Asilah. The next morning we were rudely awakened by

the sound of a VW camper van refusing to start. As long as I was already awake, I dressed, offered to help the elder American tourist and asked for a matchbook. Using the matchbook cover as a (very) rough gauge, I adjusted the clearance on the distributor points and had him try again. The engine started immediately, he was impressed (I had done this before, once or twice on my own VW), and we were invited to dine with him and his wife, both from Seattle, and owners of a butcher shop. That night we dined on freshly-cut, and perfectly seasoned pork steaks; the next morning we had eggs and toast with butter from Andorra at breakfast — two years later we hosted this couple at our home in California. This was but one of many adventures we shared during our honeymoon, and first camping and research trip outside of the United States.

Upon returning home, electrophoretic examination of the research specimens began, and Jeanne again found employment with the University. The following year, citing preliminary results from the NSF grant-supported research, I requested and received support from Sigma Xi and was granted a National Geographic Research and Exploration grant. Because few who qualified had actually taken full advantage of the G.I. Bill, and Congress offered additional benefits to those of us who had, I used this small windfall to hire a tutor in conversational Spanish at Richmond High School just before we again travelled in Spain and Morocco. Rather than rent our home out this time around, however, we entrusted its care to the neighbors, and authorized Richard Highton from the University of Maryland to use it during an extended visit to the MVZ. We again camped in Spain during the rainy season, but in Morocco, we chose to stay in hotels.

My total graduate student experience was extremely rewarding at many levels. MVZ students were required to participate in "Museum Lunch," a weekly lecture series designed, in part, to familiarize those of us new to public presentation of our research with this experience. Attendance, as far as I know, was open (space available) to all interested parties, but attendance by graduate students was mandatory. Having one's research evaluated and criticized in person by one's immediate peers, as well as by additional zoology department (and other) faculty, and visiting professionals, can be a daunting experience, but also serves to both focus and expand one's thinking. My reaction to delivering my first "lecture" was mostly nervousness, but my first try was, as I recall, well received, actually painless, and instructional. Combining that with less formal presentations during "Herp Group" at the Wake home and the (required) experience of teaching the laboratory portion of a course in biology for non-majors did much for boosting self-confidence. With regard to the latter, during a meeting of graduate teaching assistants, I suggested we add an essay style question to the mid-term. Obviously more experienced than I, all agreed as long as I would grade all essays. I volunteered to pose the question and grade all responses; less than half-way through the grading session, I fully understood why essays were not used as a standard means by which to evaluate students. Does one evaluate grammar, spelling, syntax? How close is "close enough"? Experience is, in fact, the best teacher.

With lab work and analyses complete, a dissertation completed and accepted, and final departmental seminar delivered, I began — reluctantly — to begin perusing opportunities for permanent employment. Museum openings are always difficult — too many interested parties, too few opportunities. When the offer of a Fellowship in Herpetology at the California Academy of Sciences became available, I chose to accept it, leave Berkeley and commute across the Bay to San Francisco. The fellowship was for only one year, but it came without expressed conditions. I viewed it as an opportunity to continue work with the amphibians and reptiles of southern Spain. Although my dissertation project addressed and

answered general questions regarding biogeography of several species pairs, the results had also suggested previously unrecognized genetic differentiation between two species pairs that required immediate attention. Working first with the Iberian painted frog (*Discoglossus* sp.), I was surprised to receive a letter from an Italian herpetologist (Benedetto Lanza) whom I had never met, but who had become aware of this project. He advised me that he was working on a previously unknown species from the same genus, and from within the same general area as the one I was considering. After researching the locality from which his specimens were taken, I wrote and asked to see his "raw" data so I might make a comparison with mine. Truly the consummate professional, Dr. Lanza shared all his data with me by return mail, and after determining that his specimens and mine represented different species, I shared my findings with him. We later met one afternoon years later while Jeanne and I were visiting Florence. I had a brief opportunity to express my gratitude to him in person. Nobody else had recently ventured into species differentiation in the worm lizards from both continents, however, and my amphisbaenian description was pretty straight-forward. As I had learned to do earlier in my career, I took advantage of being in museum settings to borrow and examine specimens I might later study. Data analysis can be accomplished almost anywhere, but taking data from, and caring for, specimens preserved in alcohol (especially large forms) requires different facilities.

During my residency at the California Academy, I accepted a research assistantship with Linda Maxson in the department of Genetics and Development at the University of Illinois, Champaign-Urbana. Accepting this opportunity was difficult on several levels, not the least of which was that it was in Illinois, thousands of miles from our California home, and had been described as being "almost guaranteed" to extend for two years. Nevertheless, Jeanne and I decided to move to Illinois where Jeanne could pursue a Masters degree in Horticulture while I learned the intricacies of micro-complement fixation and related data analysis. We rented our home to a British couple who was teaching at a local private school, and once again drove across the country towing the, now-historic, VW. We rented a graduate student apartment (neither air-conditioned nor well-insulated, no charge for the roaches), eventually adjusted to extremes of heat and cold and, as I began work with Linda, Jeanne registered for required classes. Tom Uzzell was just down the hall, and Mark Hutchinson, researcher from Australia, was also there; he, his wife Rhonda and daughter Amy, rapidly became personal friends. The Hutchinsons returned to Australia, Jeanne's first graduate year was successful, and two collaborative projects with Linda and others had been completed before the first year of my assistantship came to a close. My "almost guaranteed" second year of grant funding, however, was not approved, and our tenants returned to Great Britain a year earlier than scheduled, all of which made our decision to return to California the obvious choice. Our return route allowed us to visit national and state parks not previously visited as we again moved west. During the drive, I promised Jeanne that if I could not find employment in herpetology (or similar) within the next two years I would concentrate on finding a different career path — hopefully on the west coast.

After being welcomed back into our Richmond, California, neighborhood, Jeanne returned to the University to accept yet another position, and I continued my search for permanent work. When we initially purchased our home we had each liquidated every asset we owned (including my investment in the Federal Retirement System) in order to scrape together a down payment sufficient to serve as a fifty percent down payment on the house. The unemployment insurance I collected from the State of Illinois, available for only seven months, more than covered our mortgage and insurance expenses, so we had a while before

any real panic set in. It was 1986, and as I continued to apply for jobs I re-opened the *Macroprotodon* research project I had begun in 1972 at the British Museum. My data were on IBM punch cards, and I had run a preliminary discriminant analysis during a research course in the botany department at Berkeley, but had not found an opportunity to complete a preliminary manuscript — now I had some free time. I accepted an editing opportunity from the University of Illinois and interviews with the New York State Museum and Arizona State University. Most job applications went unacknowledged however, and a few were not accepted for bizarre reasons. One refusal admitted receipt of 80 responses to their very tightly-worded position description, but the college later decided to withdraw that position and use the money elsewhere. One Pennsylvania institution offered an interview but refused to pay air fare or cover hotel expenses; to make it even less desirable that department would not reveal a salary range or the number of interviewees selected (statistics matter when self-paid trans-continental transit is involved).

Albany and Arizona museum positions sounded truly promising. Albany had advertised for a mammal or bird specialist, but "other specialties would be considered." When I was offered an interview at each, I was truly enthusiastic about possibilities offered. Upon arrival in Albany, I was met at the airport and driven to the home of my "sponsor." The next day was mine to explore the museum and meet with staff. The following morning I was to be interviewed in a group setting following my presentation. I carried presentation material on my person, and when my checked bag had not arrived by the morning of the formal interview, my sponsor loaned me a clean shirt just before I went on stage. I "de-compressed" with a brief introduction into who I was and what I did and thanked my benefactor for the loan of a newly-pressed shirt. After answering a few preliminary questions, I asked for the first slide. The projectionist flipped the switch, the lights went down, and the projector first went bright, then dark. After a few seconds, we heard "No spare bulb. Be back in a few." I walked over to the corner of the stage, moved a stool to the center, sat down and asked "Any questions?". When the laughter subsided, we began a discussion into my history, why I wanted to come to Albany, etc. The bulb was soon delivered and installed, I breathed a sigh of relief and delivered the essence of my Ph.D. research. I left Albany feeling I had done very well and later received a telephone call supporting this impression. When the decision was finalized a few months later, it was explained that the museum had chosen the bird specialist, but I should not be discouraged because they anticipated a herpetology position to be approved soon. I wasn't disappointed, really... they asked for a bird or mammal person but gave me a solid chance anyway (the herp position was never funded). Arizona was a bit different. I gave what was probably the best performance of my life on that stage, many in the audience obviously appreciated my presentation, and from that very well-informed audience, I received some interesting questions. I actually had fun up there — no nerve problems at all.

Prior to each interview, Jeanne visualized a garden designed to fit within the location's climate and environment, and she was most excited about Arizona (challenges differing from those of either coasts). When Jack Fouquette called he was truly apologetic; apparently there had been an internal debate focused on me and one other applicant. And after three internal debates ending with tied votes, they decided to offer the position based on the sizes of their vertebrate collections. Their fish collection was larger than their amphibian and reptile collection (I was surprised to hear this), and the ichthyologist would receive first right of refusal. The herpetology collection was next in size, so I would be offered the job if the ichthyologist turned it down. How could I possibly have prepared for that? I am a herpetologist. But the ichthyologist was already employed at a different university...perhaps

there was a chance. Nobody's luck is infinite, however, and following the day of the final decision my life began to undergo a massive change. The rejection from Arizona State signaled to me that although opportunities for employment "relevant" to my direct interests might lie in the future, for the time being my job search required considerable adjustment. We were comfortable living in California, and Jeanne's encouragement and support took on new importance as she was now our only means of support; I had to re-think, with little time to delay, what to do next.

If you are going to be unemployed, the San Francisco Bay Area is a better place than many for the experience. I continued perusing *Science* and the *Chronicle of Higher Education* for employment opportunities, and tailoring my applications to listed opportunities became routine. When it came to non-science positions locally, however, having a Ph.D. would be more detrimental than positive. I truly understand why an employer would consider me "overqualified," but I never received a response to my question "Would not any of your current employees leave if offered a better opportunity?" Apparently not...nor does it matter. I was a military veteran with experience in personnel management, who had once held a permanent position with the U.S. Post Office as a mail carrier on a delivery route requiring a truck. But even United Parcel Service would not consider me a suitable hire in 1987. I began thinking that having been in prison would open more doors — rehabilitation support was available.

The California State Employment Department at that time sponsored a fee-free program to "overqualified, under employed" citizens. Enrollment required volunteer hours working with personnel offices in several fields of endeavor throughout the Bay area, and mandatory participation in training and discussion groups. I signed up, and many in my discussion group were "astounded" to hear that job interviews in academia required delivering lectures in front of academic audiences! I was surprised they were "astounded," and was soon working with persons who were, indeed, overqualified in many areas. One of my favorites was a gentleman who had worked in an advisory capacity for the World Bank overseas and had just returned to the U.S. There were many like him — middle age, well-educated, experienced, ambitious — but opportunities were few without significant "re-branding." A few months later, an advertisement for a statistician at a marketing research company in San Francisco caught my eye. I sent an application and almost immediately received yet another "overqualified" response. After considerable thought and re-reading of both ad and rejection, I called the personnel office and requested an in-person interview. Three days later, dressed as a San Francisco commuter, I presented my case to the personnel officer — "Over qualification is difficult to remediate ... and can lead to homelessness and hunger...would it be possible for me to speak to the company president?" The president agreed to see me as he ate lunch at his desk (I love California!). He explained that the position was mid-level and would require writing, editing, and evaluating reports, but a knowledge of statistics would be helpful rather than essential. I told him the only difference between his reports and mine was subject matter, and to prove it, I was willing to work for him for a full month at no charge. If after that month, he was not satisfied, I would leave without argument. He was obviously amused and said he'd think about it. The following Monday morning, I was in the shower when he called. He had decided to give me a chance, on my suggested 30-day trial, and asked if I could start the following Monday. My first assignment was preparing, from pretty meager notes, a draft of the presentation he would be giving in a week at a conference being held in Los Angeles. The topic was, essentially, an introduction to the company's new product — my immediate supervisor and I discussed details regarding the new product, and I began work. Two days

later, I handed Fred a draft, and he called me at home a few evenings later and said, simply, "Amazing. Welcome to the fold." I now had a job with a decent salary and benefits.

The position itself was interesting and introduced me to a lot of "driven" people. For a time, even commuting across the bay on B.A.R.T. was all right. The trip varied in time, depending upon how many times, and for how long, the train stopped under the Bay before it reached the other side, but beginning as I did at one end, having a seat in the morning was almost guaranteed. Eventually, however, Jeanne and I tired of not knowing at what hour in the evening I would be "dismissed." One long week in particular had each day in the office stretch into 12 hours. Jeanne suggested that I think about finding something on the Berkeley side of the Bay.

As luck would have it, just about then, the California Department of Justice began a pilot program introducing Crime Analysis to municipal police departments. I applied to offerings within four local jurisdictions (two within bicycle distance); the City of El Cerrito was the second to offer an interview. It was 1987. I would have my own computer (a big deal then); my primary responsibility was to initiate contact and communication with other East Bay municipalities (difficult to believe it did not exist already, but it mostly did not), and I became treasurer for the Bay Area Crime Analysts Association. What's a zoologist do in a Police Department? Pretty much anything he thinks might be useful. In addition to preparing annual crime statistics reported to the FBI, I worked with our patrol officers and adjacent municipalities when serial (or other) crimes became apparent. Interstate 80 runs through most East Bay communities and serves as an escape runway; flea markets become opportunities for disposing of stolen property. Eventually I became closely-associated with the Chino Police Department's special services manager (a frequent instructor at the FBI Academy), and with a statistician at the Nevada gaming commission who specialized in mathematical techniques useful in police operations. Together we published two volumes on Crime Analysis (see Gottlieb et al., 1992 and 1994).

As Jeanne and I became less concerned about financial security, we planned our first "real" vacation since graduate school. City Planning offices housed drafting materials and copy machines for use after business hours, and I completed the necessary maps for the *Macroprotodon* manuscript (now its 15th year *in prep*) as my agreement with Jeanne to spend only two additional years searching for academic employment was nearing an end. I had seriously begun looking at permanence in the Bay Area. I developed and hosted a course in statistics for police departments wishing to initiate crime analysis units (or subunits) and became acquainted with city officials to the extent that I was recommended as a candidate for the post of assistant city manager. Concurrent with my police department experience, the U.S. Fish and Wildlife Service Division of Law Enforcement had begun building a wildlife forensics laboratory in Ashland, Oregon. Jeanne and I had visited the site during a mountains-to-sea camping vacation. Applications for employment would be coming soon, and I added my name and address to the mailing list. Government statements of "soon" often become "years," but when positions finally became available I applied.

NOTE: Applications for upper-level government positions can be tricky. In 1984, I applied for an advertised position as a herpetologist with the endangered species office in D.C. and was found not qualified to compete. Perplexed (after gaining additional education and experience as a herpetologist I was no longer qualified to work for the department in which I had previously worked?), I called to ask why. "Well", I was told after about a week of waiting to hear, "apparently personnel was confused by the wording in your application." In short — using the word "herpetology" was confusing because the position asked for

experience with "amphibians and reptiles." It was suggested that I use "straight-forward terminology" in future applications because persons rating applications are clerical employees, not scientists (Huh?). He was sorry, but the position was already filled.

"Once burned, twice shy" as they say. When the position for a reptile specialist was offered for the forensic lab position, I asked Jeanne to "proof read" my application looking especially for "unfamiliar or unusual" vocabulary. This time personnel scored my application at 105 out of 100 (the extra 5 points because I am a veteran). The job offer, delivered by telephone from the lab director was somewhat confusing and quite unsettling; he began "I **have** to offer you the job, this has never happened before." I responded "I don't want to work where I'm not wanted." He further explained "I've never seen an application scored over 100 points, and because you're a veteran, I am required to offer the job to you before I can offer it to anybody else." Thinking that he found my military service somehow a detriment to his laboratory, I asked "What (or who) is the next highest on the list? If you subtract my extra 5 points, how does it look?" "The next highest is 90, but that doesn't matter. The position is yours if you want it." Having never heard of this lab director, I asked for a few days to think about the offer, made a few telephone calls, and Jeanne and I once again discussed our options. We would have to move, again not knowing what truly lay ahead. Because of my prior government service, I did not have to worry too much about being found unsuitable for the position, but I was really happy working for the City of El Cerrito. Acceptance of this position, however, would allow reinstatement of my previous 10 years in the Federal retirement system, get me back into herpetology once again, substantially increase our income, and place me in what was often rated as one of the ten best places in the United States to retire. We decided to take a chance and moved to Ashland in October, 1989 and, in an area where bumper stickers read "Do not Californicate Oregon." immediately re-registered our 1987 Toyota station wagon, and soon purchased a house in the hills overlooking the Siskiyou valley. Adjusting to this new neighborhood was easy as most of our neighbors had moved up from California relatively recently, and we soon became "settled."

The need for such a facility was well-understood nationally, and long in coming. The section of morphology, however, was the last lab section to be populated, and Beth Ann Sabo, a bird (feather, actually) specialist and George Mason graduate who had earned her Master's degree under Carl Ernst, and worked with Roxie Laybourne (noted for work with the FAA concerning bird-instigated airline crashes) at the Smithsonian, and I were the entire section for several years. There was no reference collection, no library, and very little expertise among laboratory personnel involving CITES, endangered, or animal trade species. We had no mammal specialist, nor were there any paid technicians. Beth Ann and I worked together to build a reasonably functional laboratory. I still smile when I think of the laboratory photograph often provided to the press: a full-sized, adult, mountain lion lying under a monocular dissecting microscope. That says it all. . . .

Being first has advantages, but challenges were frequent and serious. I flew to Los Angeles one afternoon to receive a hair collection assembled by a retired microscopist; we used that extensive collection (zoo animals) frequently to eliminate, rather than positively identify, species. In order to determine species sources for confiscated items sent by wildlife inspectors, we had to confirm suspected identifications by comparison with positively identified material in museum collections. Because of the breadth of their collections, we used the Smithsonian in Washington, D. C., the Field Museum in Chicago, and the Carnegie in Pittsburgh most frequently; as our need for examination materials became burdensome, we negotiated contracts for services with professionals at all three museums. When USFWS

confiscated an extensive collection of trophy mammal hides and heads in Raleigh, we selected those of importance to our mission, but still had no appropriate storage facilities. A military surplus trailer fitted with large capacity freezers became our preparation lab. Our ability to recruit and train volunteers in the art of skeletonization and preparation of study skins kept us moving forward. Together Beth Ann and I designed a "bug" chamber, housed in the utilities room, in which to raise dermestid beetles for skeletonization in order to develop a "museum style" process for building collections of vertebrate parts.

As an adjunct to word-of-mouth, I sent a blanket letter to all AAZPA members asking that we be considered when animals in their care died or were euthanized (we paid shipping). I later attended an AAZPA conference in Indianapolis and (reluctantly - I do understand sentimental attachment to animals) delivered a "call me if they die" talk to attendees. When a circus elephant died in the Tampa, FL, area I asked our agents to try to recover it —or parts from it — from the dump where it lay. Who knew there is an official elephant parts waiting list (?), and I had the lab's name added to it. But when two albino tigers were euthanized, USFWS Special Agents and an interested secretary were dispatched to clean the skeletons. United Airlines delivered the carcasses to Medford airport, and we completed the preparation work. When finally authorized to hire a mammalogist, I chose Bonnie C. Yates (a well-respected zoo-archaeologist from North Texas). Later I negotiated the rental of an off-site warehouse, had it insulated and air-conditioned, and added museum cabinets and a chain-link fence (for hanging trophy heads) for storage of comparative materials. In short, we three created a vertebrate museum collection (dubbed Forensic Park) from "scratch".

Prior to our hiring a mammalogist, I served both as mammalogist and herpetologist, and I was frequently called upon to represent the laboratory to the public. When a Key Deer (an endangered species) was brutally beaten to death by three teenagers in Key West, I served as expert witness for the prosecution. One of the surface cracks in the unfinished table leg used to bludgeon the deer contained hairs perpendicular to its surface (indicating forceful insertion), and the defense attorney presented a size-reference-free photograph asking for an identification. I knew the hair samples were deer hair (microscopic comparison with known samples) and without a size reference in the deer-in-the-headlights photograph, I could answer only "white-tailed deer." When asked why I could say no more, I explained the size reference problem to him. The teens were found guilty, fined, and sentenced to jail time.

Because reptile skins are often dyed, and shortened or chopped up, I contacted a tanning business in Florida and periodically sent snake skins (from reptiles that had died in zoological parks) for tanning. The method used, I reasoned, would likely replicate that of commercial preparation of "naked" skins. Over time, many snake species used as commercial leather became represented in our reference collections. Infra-red photography "cuts through" some dyes. Python (and other) species can be determined from examination of underlying dorsal color patterns. But building a complete reference collection was difficult; I contacted an importer and asked him to provide freshly-killed snakes from his Chinese supplier (who claimed to have a captive-raised operation) so we might identify the species.

By the time the laboratory was fully-staffed, we already had off-site freezers filled with confiscated crocodylian materials and were eventually able to borrow reference specimens from museums willing to ship (if we paid shipping), or visit collections in the U.S. that, because of numbers and volume could not ship. Also by this point in my career, I was well-versed in both discriminant function analysis and taxonomic problems with *Caiman*. Sima Pandya (a former USFWS wildlife inspector) and I completed a U.S.-wide search for specimens from known localities, borrowed those specimens, and categorized external

characteristics. Upon completion of data analysis, I presented our results to the Office of Endangered species, to a Smithsonian Institution audience, and to interested parties at an international herpetological meeting in New Orleans. Together we jointly-presented our results to an industry-supported group in Santa Fe, Argentina, Sima earned a Master's Degree based on the project, and we later published our findings regarding *Caiman* identification in *Herpetologica* in 2001.

During my tenure at the laboratory I was loaned to the Shedd Aquarium to assist in developing a child-proof, "hands on," exhibit detailing laboratory procedures for the program "Silent Witness." Working with the exhibits staff, we developed six successful "child-operational" demonstrations for their traveling exhibit highlighting laboratory identification procedures. The week the exhibit opened, I participated in an interview on NPR in Chicago, and presented two lectures to differing audiences. The first followed a semi-formal dinner for donors, but my favorite was the second when I more-talked-than-lectured to "interested citizens" (the second evening was video-taped). I later participated in the well-developed and managed annual program "Science for Conservation" sponsored by the *Indianapolis Star* and, along with five additional participants, lectured to a "sold out" theatre full of local school students. When the Zoological Institute of India (Dehradun) initiated a forensic facility (1997), I and four other USFWS personnel were sent to India to assist in planning. "Silent Witness" earned me a Special Achievement award, and my Dehradun visit received recognition for being a significant contribution to natural resources conservation and management from the USFWS Office of International Affairs. On my final day in the Laboratory, I was filmed for the segment "Wildlife for sale, dead or alive" from "The Nature of Things," a production hosted by David Suzuki of the Canadian Broadcasting Company.

When asked what my "dream job" would be, I always answered "working in a natural history museum," specifically one with a herpetological collection. In 1996, that opportunity came as an adjunct to my having been selected for the more inclusive position of Director of Research and Collections for the North Carolina State Museum of Natural Sciences. I had been chosen to assist with a massive re-development project for the 1879 museum as it moved from its location in the N.C. Department of Agriculture to a newly-constructed and vastly-improved stand-alone museum located within downtown Raleigh (see <http://naturalsciences.org/about/museum-history>). When Jeanne and I arrived in Raleigh, I was immediately impressed by how quickly and completely the city had "cleaned up" following Hurricane Fran, and by the sheer size of the excavation site bordering Bicentennial Plaza. This cavity would eventually house the new Beaux Arts style museum building, with its massive Blue Whale and dinosaur skeletons, tropical butterfly garden with a living sloth, and life-size replicas (modeled from actual localities) of all habitat zones, each of which included taxidermied, plasticized, and living representatives of insect, fish, amphibian and reptile species found in habitats across North Carolina. Offering admission at no charge, the Museum remains the largest institution of its kind in the Southeast and immediately became popular with school systems across the state, and with visitors from across the world.

Upon arrival, I immediately became acquainted with the collections by assisting in the transfer of alcoholic fish (currently ~1.3 million specimens, many donated by Duke University and the NC Institute of Marine Science) from tractor trailers to greenhouses no longer in use, and being amazed at the sheer size (and difficulty of access) of the amphibian and reptile collections (~250,000 specimens). Because these museum collections contained specimens in ethyl alcohol, the city required explosion-proof rooms if we were to keep them in downtown Raleigh. Rather than add millions of dollars to original building cost estimates,

the Museum instead decided to build a brick Research Annex outside of city limits. Originally I wanted my office to be located in the Annex. My request was denied, and I moved into the first below-ground level floor of the downtown building (the paleontology, bird, mammal, and geology collections are housed in the second below-ground level floor).

Assuming an administrative role in a museum reduces research time considerably. Among the first assignments included ensuring factual, and grammatically correct, representation on information presented to the public. When the exhibits development company withheld access to electronic text files during a "dispute" very near to our scheduled opening (thereby delaying project completion on the part of ancillary contractors), I hired a "private" typist to re-create electronic files from available typescript. We managed to meet important deadlines in spite of the continuing disagreements between contracting parties. When the whale skeletons prepared in the early 1900s required cleaning and renovation, the word "asbestos" became heard far too commonly, and finding suitable removal teams also became personnel and financial challenges. We obtained "excess" museum cases suitable for re-conditioning and use for paleontological and geologic specimens from the National Museum of Natural History in Washington and hired two moving vans to pick up and deliver them to a no-longer used portion of the former public market (the "Banana Warehouse") that we had inherited earlier. This area, including trailers from military surplus, became storage units for these cases, whale bones, and miscellaneous unused equipment, in addition to providing space for negative pressure work stations during asbestos de-contamination. When the new building became available for occupancy, the second below ground level floor required specialized painting, and I was introduced to a portion of the state's female prisoner population as the painting crew required supervision — a portion of the male population had already been selected to serve as the moving crew for museum cabinets. By the time the new museum opened to the public in April, 2000, I had gained much experience that I had never anticipated as being part of a Research Director's job. I can truly say life was never boring, and each experience was, in its own way, educational. Working with the Museum staff throughout this historic period was truly rewarding. The ultimate seal of approval was perhaps delivered by hurricane winds passing through Raleigh during our official museum opening — no significant damage to the museum building, and no injuries among the hundreds (perhaps thousands) who lined city streets in anticipation of their first visit to this new monument to sheer perseverance on the part of all involved in its making.

In my spare time, more or less, I had made contact with former USFWS Law Enforcement Division colleagues to obtain endangered species and marine mammal importation permits (our Blue Whale had been salvaged from the St. Lawrence River, and processed in Quebec City). Upon completion of cleaning and "re-assembly" of the whale, we arranged a suitable pathway for two flat bed trailers to follow during delivery to North Carolina. Rather than our use of Niagara Falls, USFWS insisted we leave Canada and enter the U.S. via a less-used entry port in northeastern New York; the Boston office of USFWS was assigned responsibility for meeting an early-morning arrival of our most precious cargo. The NC Division of Highways permitted entrance to Raleigh via a wide and heavily-used access road, and suggested entry well before rush hour. When the whale had been delivered and installed, Betsy Bennett (then Museum Director) presented me with a gift of M&M chocolate candies (a truly personal touch).

Before I retired in 2006, I had supervised the design of an exhibit featuring the museum's history (Nature's Explorers), edited museum and resource department publications (including the scientific periodical *Brimleyana*), and been marginally involved with producing a volume

detailing museum history. Although not fully understanding why I, who had only recently even visited North Carolina, should be given this particular assignment, during my tenure I worked closely with Margaret Martin, a talented writer long-associated with the museum, who had been contracted to produce a single volume (*A Long Look at Nature* [2001]) in which the museum's history is very well interpreted. Her handwritten inscription on the cover page of my copy "...Couldn't have done it without you..." suggests the extent of our successful cooperative effort.

In addition to assisting with the building of a new museum, I also provided manuscript reviews to outside scientific journals, served as an associate editor for the *Journal of Herpetology* (2000-2002), and completed some "previous interest" herpetological research (2000-2006). Robin Lawson at California Academy and I executed a cooperative effort during which he would prepare and analyze mitochondrial DNA from specimens I had used in my electrophoretic study, and together we compared data realized from my dissertation research, and from previous morphological studies, as an example of differing results that can arise when studies examine differing biological components from within the same individuals. DNA provides one answer, but that answer is not necessarily "the" answer. Because neither of us had funding for this research, DNA was processed on a "space and time available" basis, but together we published four comparative studies.

In 2003 (p. 23), Mateo et al. wrote (translation mine): "Social and political changes [following Francisco Franco's death in 1975], coupled with the publication of Alfredo Salvador's guide to Spanish amphibians and reptiles (1974) is credited with stimulating increased study of herpetology and it was "...during these years, Stephen Busack, a North American military man from the Naval Air Base at Rota began to become interested in the herpetofauna of each side of the Strait of Gibraltar. His point of view, the quality of his work, and his consideration of the Strait as a magnificent natural laboratory, credit him with a place of honor in the history of the herpetology of the region. Among his many published works ... we highlight "Biogeographic analysis of the herpetofauna separated by the formation of the Strait of Gibraltar (Busack, 1986)"... as establishing evolutionary hypotheses operational yet today." This positive assessment of my work in Spain arrived at a time when Jeanne was suffering stage four ovarian cancer, it was good to know my work was considered valuable, of course, but this seemed somewhat irrelevant at the time.

Jeanne had recently passed away when Hal Heatwole first asked me to consider editing Volume 11, Part 2 of *Amphibian Biology*, and I turned him down. Eventually, however, I "came around" and agreed to take on the *Status of conservation and Decline of Amphibians: Eastern Hemisphere. Part 2. Northern Africa*. Working with 13 additional researchers from the region, and finally overcoming internal publishing house problems by enlisting the Spanish Herpetological Society's assistance, Hal and I published chapters 23–29 in 2013.

In 2007, I moved to Rochester and re-married (Gin, my new wife [Virginia L. Stark in 1960], and I had dated in high school); in 2010 we accepted an amazing offer from a tour company (three weeks in Torremolinos, Spain, including air fare, sea-view apartment with daily breakfast, and a few dinners at local restaurants for about \$1,000 a person). My desire to return to Spain after all those years was unrelenting; I rented a car in Spain for ten days, and contacted several colleagues before departure. Rather than spend our entire visit in a tourist haven, I wanted to show Gin the Spain I had once known, as well as meeting researchers with whom I had been corresponding, and habitats I had often visited. Upon arrival in Málaga I was shocked — the coast was now filled with high-rise apartment

buildings, and traffic was terrible along the route to Torremolinos. Many of my earlier routes for exploration in the province of Cádiz — some simply dirt tracks then — were now four-lane divided highways. Nevertheless, we thoroughly enjoyed this visit, and I became re-energized to "go back to work." And so I have... I continue to visit southern Spain to gather additional comparative data (photographs of habitats, amphibian densities today, etc). Many years ago when Bill Maxwell had asked what I expected to gain from all my fieldwork, I answered "knowledge regarding the amphibians and reptiles from this part of the world."

I may accidentally have been more successful than I ever imagined. According to Spartaco Gippoliti and Colin Groves (2018): ". . . *Phylogenetic thinking in Europe was first applied to the Iberian herpetofauna by an American herpetologist (Busack 1986) and, together with the adoption of molecular techniques, had a pivotal role in revealing the true species richness and establishing the Iberian Peninsula as the paradigmatic 'refugium within refugia' (Gómez & Lunt 2006)*" . . ., and it's not over yet.

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Birthplace: Rochester, New York.

Marital Status: Married, no children

Education:

B.S., 1967, Cornell University

M.S., 1977, George Mason University

Ph.D., 1985, University of California, Berkeley

Positions Held:

United States Peace Corps, Hilo, HI, and Manila, Philippines

July - October 1967, Trainee

Archbold Biological Station, Lake Placid, FL

November 1967 - March 1968, Research Assistant (mammalogy)

United States Navy, Great Lakes, IL

March-October 1968, Recruit (E-3)

United States Navy, Charleston, SC, and Rota, Spain

October 1968–March 1972, U.S.S. Holland (AS-32), Personnelman (E-4 & E-5)

International Biological Program, Desert Biome Section, Gabès, Tunisia,

March-June 1972, Field Assistant (herpetology, mammalogy)

U. S. Fish and Wildlife Service, Washington, D.C., National Fish and Wildlife Laboratory,

September 1972-May 1978, Museum Technician

University of California, Berkeley, Museum of Vertebrate Zoology and Biology

Departments, July 1978 to August 1980, Staff Research Associate

September 1980 to February 1981, Teaching Assistant

March 1981 to July 1984, Staff Research Associate

Peabody Marketing Decisions, San Francisco

January 1987 to April 1987, Senior Research Analyst

City of El Cerrito, CA, Department of Police

August 1987 to October 1989, Crime (Statistical) Analyst

U. S. Fish and Wildlife Service, Ashland, OR, National Fish and Wildlife Forensic Laboratory

November 1989-October 1996, Chief, Section of Morphology

North Carolina State Museum of Natural Sciences, Raleigh, NC

November 1996 to October 2006, Director, Research and Collections.

October 2006 to present, Director *Emeritus*, and Research Associate

Awards and Special Recognition:

1967 Certificate of course completion. Malaria Eradication Training Center (Republic of the Philippines Department of Health, U.S. Agency for International Development, U.S. Public Health Service, and World Health Organization), Manila, Philippines

1972–1985 Field Associate, Carnegie Museum of Natural History

- 1974 Special Achievement Award, U.S. Bureau of Sport Fisheries and Wildlife
 1975 Travel support award, Allegheny Foundation for Animal Behavior Studies
 1982-1984 Dissertation Improvement Award, National Science Foundation
 1983 Sigma Xi award
 1983 Research and Exploration Grant, National Geographic Society
 1983 Travel Award, Jessup-McHenry Fund, Philadelphia Academy of Sciences
 1984-1985 Fellowship, Herpetology, California Academy of Sciences, San Francisco
 1985–Present Research Associate, Carnegie Museum of Natural History
 1985-1986 Fellowship, Genetics and Development, University of Illinois, Champaign-Urbana
 1993 Special Achievement Award, U.S Fish & Wildlife Service, Division of Law Enforcement
 1997 Certificate of Appreciation, U.S Fish & Wildlife Service, Office of International Affairs
 2004-2007 Biological Research Collections Grant, U. S. National Science Foundation (co-written with Wayne Starnes)

Field Work: United States, Panamá, México, Hawaii, Guam, Philippines, Spain, Morocco, Tunisia

Professional Organizations:

American Society of Ichthyologists and Herpetologists, 1962-present

Life member 1962

Deutsche Gesellschaft für Herpetologie und Terrarienkunde, 1972-present

Herpetologist's League, 1960-present

Life member ~ 2006

International Society for the Study and Conservation of Amphibians, 1982-present

Editorial Board, 1986-1994

Societas Europea *Herpetologica*, 1980-present

Editorial Board, 1992-1997

Society for the Study of Amphibians and Reptiles, 1968-present

Life member ~2006

Section Editor, *Herpetological Review* 1994-1996

Associate Editor, *Journal of Herpetology*, 2000-2002

**Endnote – Contributions to the history of the Division of Amphibians & Reptiles –
USNM**

As one grows older, there comes a desire to record one's past experiences and also the history of one's workplace. None of us in the USNM Division of Amphibians and Reptiles has expressed a desire to write a divisional history for the past half-century. As an alternative, I am encouraging colleagues who have been associated with the division to create autobiographical sketches. Although such sketches will not provide a detailed history of divisional activities, each offers a unique perspective of past divisional activities and insights into each author's contribution to the division and, of course, a window into the author's personality.

The SHIS series is an obvious outlet. SHIS has been a facet of the division's contribution of research information to the herpetological community since its establishment in 1968 by James A. Peters.

October 2018 GRZ

Previously published contributions to divisional history

- SHIS 1. A list of the herpetological publications of the United States National Museum, 1853-1965. James A. Peters 1965 [revised 1968].
- SHIS 42. A revised list of the herpetological publications of the National Museum of Natural History (USNM) 1853-1978. Ronald I. Crombie 1979.
- SHIS 51. Biography and bibliography of James A. Peters. Frances J. Irish & George R. Zug 1982.
- SHIS 101. Herpetological publications of the National Museum of Natural History (USNM), 1853-1994. Ronald I. Crombie 1994.
- SHIS 147. Biographical sketch and bibliography of W. Ronald Heyer. W. Ronald Heyer & Miriam H. Heyer 2016.
- SHIS 148. Biographical sketch and bibliography of James B. Murphy. James B. Murphy 2016.
- SHIS 149. Biographical sketch and bibliography of C. Kenneth Dodd, Jr. C. Kenneth Dodd, Jr. 2016.
- SHIS 150. Biographical sketch and bibliography of Carl H. Ernst. Carl H. Ernst 2016.
- SHIS 151. Biographical sketch and bibliography of Richard Highton. Richard Highton 2017.
- SHIS 152. Biographical sketch and bibliography of Robert P. Reynolds. Robert P. Reynolds 2017.
- SHIS 153. Biographical sketch and bibliography of Jeffrey E. Lovich. Jeffrey E. Lovich 2018.