Academic Tapestries

Fashioning Teachers and Researchers
out of Events and Experiences

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Missouri Botanical Garden

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Finispiece photo: Shirley and Alan Graham, Pecos River, Texas, 9 August 2008. Photograph courtesy of William Carr.

Dedication

To Shirley, Andrew, Alison, and Bruce

Contents

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Introduction

People often say to me. . . . How much time do you spend writing and how much of your time do you spend doing research? Great question. No one ever says how much of your time do you spend on thinking, and that's the most important part. . . . You know much more by the time you get to the end of a book than you do at the beginning. (Q&A with David McCullough, part II, C-Span, 11 May 2011b).

Fashioning the person and the professional has been likened to a journey in which each trestle on the track or lamppost along the walkway represents an influencing event. I like the analogy of a fabric, in which the many and varied strands represent experiences that over a lifetime accumulate to define the tapestry—its strength, color, complexity, the impression it makes, the legacy it leaves, and, ultimately, its value. These journeys of necessity must be somewhat autobiographical, and I treat this material in the first part of the book, entitled "Weaving the Fabric." Here I recount early personalizing experiences that would ultimately shape my attitude toward learning, followed by later professionalizing events that included 12 years of academic fashioning at Texas, Michigan, and Harvard; 38 years in biological sciences and geology at the once-infamous Kent State University; and a further decade of research in the Center for Conservation

and Sustainable Development at the renowned Missouri Botanical Garden in St. Louis. The approach in this section is, in part, light and personal, but the intent is deeper. One theme is that our attitudes toward students, the extent to which we choose to engage ourselves in teaching, particularly undergraduate teaching, and our approach to the other components of higher education—service, administration, and research—are conditioned to a considerable degree by early personalizing experiences and later by professionalizing events. I further suggest that these events in our formative years condition our reaction to current trends in society and how we choose to deal with them in teaching.

That we will be dealing with them increasingly in the future seems evident. A wide range of student and public concerns earlier considered outside the provenance of specialized disciplines in science are now entering these classrooms to an even greater extent. Questions are being raised about the ethics and social ramifications of a broad array of issues, and they are being raised in a more demanding and even confrontational way. For example, a professor of biology may now be asked about stem-cell research, the wisdom of growing genetically modified organisms (GMOs), and the ethics of developing crop plants with sterile seeds that require farmers to purchase new sources every year (see Nature, 2010b). The issue becomes particularly sensitive when it involves poor farmers in developing countries placed in a dependent "or else" situation. Special arrangements can be made in these instances for subsidies, but increasingly sophisticated student and public observers are aware that these arrangements can be withdrawn anytime as a result of the shifting winds of political alliances (those "in our national interest") and corporate well-being (those "in the interest of our stockholders"). Geneticists are being asked to justify cloning and to address the racial implications of advocating a slowdown in population growth; zoologists, about animal rights; and geologists, about the environmental implications of fracking, deepwater drilling, the safety of nuclear power plants, and the storage of nuclear waste. Scientists are expected to have opinions on the propriety of passing highly touted environmental laws that are in turn enforced by agencies deliberately underfunded and headed by inexperienced or disinterested administrators selected from those formerly or later employed by and sympathetic to the group to which the laws pertain. Questions are being raised about regulatory procedures developed and monitored in conjunction with those being regulated. The performance of the Federal Emergency Management Agency in dealing with the Gulf of Mexico disasters (Hurricane Katrina in 2005, the Deepwater Horizon oil spill in 2010), the Mine Safety and Health Administration in issuing 515 unenforced citations to Massey Coal in 2009 before the 2010 mine explosion, and the Securities and Exchange Commission

in failing to deal with years of disclosures about the Bernard L. Madoff financial scheme, revealed in 2008, are examples. Biologists and geologists alike are being asked about discrepancies between radiometric dates and biblical chronologies, evolution, intelligent design, and the role of theology in science curricula. The last is an increasingly complex issue because it involves identifying which theology it should be, as the nation diversifies internally through shifting growth rates among ethnic and religious groups and externally through immigration. Brynjolfsson and McAfee (2014) discuss another trend simultaneously affecting society, an "engaging and at times terrifying vision of where modern technology is taking the human race" (reviewed in the Economist, 2014).

Topics of even broader concern are further affecting the environment for learning in all classrooms. These topics include the perceived decline in the quality of American education and the implications of such decline as other nations develop economic, military, and educational parity; explaining the ever-rising costs that now prevent many from going to the top-ranked public and private colleges and burden others with massive debts, and the impact of the ever-deepening estrangement between those that have so much and those that have not nearly enough (Surowiecki, 2011). There is concern about the increasing dependency of universities on financing from industry and about the environmental health of the planet, including a truthful assessment of global warming. There is a sense of erosion in civility, ethics, and standards of excellence; an uneasiness with the extent to which virtually all fields—politics, business, journalism, religion, and entertainment—are being exploited for personal gain and ideological purposes; and concerns about reports of published scientific data that is fraudulent or distorted (Nature, 2010c; Callaway, 2011; Crocker, 2011; Reich, 2011). Oreskes and Conway (2010) address the latter issue in *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, and in his review of the book, Wynne (2010) ponders why science is willing to remain so passive to attacks by ideologues. In local situations, collective bargaining and the unionization of college campuses, vestiges of race and gender inequality, and campus safety (e.g., the Virginia Tech shootings in 2007 and 2011) are important topics. In the current economic environment there is understandably an increased interest among many students in being trained for employment rather than being educated for a quality-of-life existence or for meeting the challenges of a newly emerging global community of nations (Luhby, 2011a).

Teaching, research, and service/administration in the modern university are complicated endeavors. The role of large research universities in society, their history, future, how they function, and theories about how they should be

administered are often explored admirably in reviews from the perspective of former or present academic leaders. For example, see Jonathan R. Cole's scholarly work *The Great American University* (2009), which focuses on issues in higher education and problems facing the great American research universities. Cole lists 100 or so great American research universities that have produced the greatest number of discoveries and many of our nationally and internationally prominent politicians, business leaders, scientists, and other influential professionals.[1] In this book, I emphasize mid-echelon schools, especially those striving for prominent research status, because they constitute the majority of the nation's ca. 6,000 centers of postsecondary education, and they condition the attitudes of the overwhelming majority of new graduates that are added every year to society.[2] The sources of formal education can be arranged according to their direct contact with the greatest number of people (see Table 1).

Table 1. Sources of formal education according to their direct contact with the greatest number of people (from highest to lowest)

High School

↓

Small Colleges/Universities (2-year or 4-year without graduate programs)

Liberal Arts Colleges

Community Colleges

Technological Colleges

Online Colleges

For-profit Colleges

↓

Mid-echelon Universities (4-year with graduate programs)

↓

Great Research Universities

In this hierarchy formal education has its greatest direct impact on the largest number of people in the primary and secondary schools, followed by mid-echelon colleges and universities. It has its greatest impact on fashioning the attitudes of global leaders (science, business, politics) at the great prestigious universities and graduate schools. Thus, providing skills and imparting attitudes is important for all categories but for different reasons. A point being discussed in the current educational literature is the feasibility of so many mid-echelon schools trying to emulate the great American research universities, with intercollegiate

athletic programs in tow, considering the costs and the slim chances of real success (Christensen & Eyring, 2011). Serious downturns in the economy and increasing competition from less expensive post–high school alternatives stimulate this discussion. In the long term, enrollment-financed mid-echelon schools will be under increasing pressure and will have to make some hard decisions about providing quality undergraduate education, more economical technical training, or leadership in research in order to keep from being caught in a no-man's-land. These decisions include adopting true year-round academic calendars, increasing graduation rates within four years (now only at ca. 35%), hybridizing traditional campus instruction with online instruction, reducing program duplication between geographically close rivals, and even closing campuses. In Ohio Governor James Rhodes (1963–1971) wanted a state-supported university campus within 30 miles of every citizen, and the budgetary burden of that policy still remains. However, economic upturns ease the pressure for change, so educators, administrators, and multiple generations of students at the mid-echelon schools will continue to face challenges similar to the present.

Regardless of future trends, both categories of universities, the 100 great ones and the ca. 6,000 smaller ones, graduate about 56,000 students each year. Among an adult population of 185,000,000 (U.S. Census Bureau), approximately 70% do not enter or have not completed training at any college or university.[3] This means that a very small percentage of people are directly influenced by values professed at America's 100 top universities, although the impact of these schools in other ways is profound. The previously rather latent influence of the nonformally higher-educated vast majority and graduates from mid-echelon universities, community colleges, and technological schools on the nation's political, social, and cultural fabric is changing through greater activism, organization, and collective action facilitated by the Internet. The ability of the Internet to mobilize people toward collective action was seen in a 2011 campaign encouraging people to switch to small banks because of perceived greed and mismanagement at the big banks. The movement was expected to attract about 2,000 supporters but instead drew 77,000 supporters, and the numbers are growing. In late 2011 OCCUPY protestors from Wall Street to Washington, D.C., Oakland, Portland, and elsewhere carried signs reflecting both a national and a globally emerging attitude: "the 99% against the 1%." Columbia University economist Jeff Sachs (2011) believes the movement may usher in a new progressive era in the United States. At the very least it promotes recognition among the general public of those who are "doing" versus those being "done to" and an awareness that the trickle-down theory involves those who are doing the trickling and those being trickled on. There is greater sophistication and less naiveté about messages (e.g.,

"The American people just want to put all that behind us") and denials (e.g., "None of that took place"). Greater public activism by those without formal higher education, combined with those educated at small colleges, is one of the emerging realities within which our society will be increasingly obliged to operate. In aggregate and when provoked by stalemates, perceived unfairness, and the excesses of the 1%, the majority is increasingly influencing public policy, conditioning the environment in which teaching and research take place, and setting more grassroots-generated agendas for the nation.

References cited in this book include many from the Internet and news reports taken from global wire services, magazines, and the general press. These references are deliberately included to emphasize that many of the concerns raised here are being widely discussed in the media; for example, see "Surging College Costs Price Out Middle Class," from *CNN Money* (Censky, 2011); "Welcome to the Anthropocene" and "A Man-made World," from the *Economist* (2011b, 2011c); and "Quantifying America's Decline," from the *Wall Street Journal* (Bennett, 1993). A major challenge for educators today will be how to communicate and exchange ideas with the majority of Earth's coinhabitants, most of whom reside outside the ivory tower, and to anticipate the increasing impact they will have on all schools, great and small.

This book further offers a perspective from one who chose to remain on the front line and enter the classroom and laboratory daily, rather than veer into full-time administration, and has witnessed first-hand the changing realities of teaching and research over the decades. It explores the reasons why we as teachers in higher education are motivated to involve ourselves in concerns like those raised above and with our awareness of the intensifying interest now fermenting around those concerns. The depth of this involvement depends in large measure on the nature of our individual personalizing and professionalizing experiences, capitalizing on the strengths and confronting the weaknesses imparted by those experiences, and on our ability to maintain an intellectual youthfulness that allows adjustments to the ever-changing educational needs and the shifting social and economic realities of the nation; namely, our ability to avoid what Colin Macilwain (2011: 447) calls "sleep-walking through the greatest crisis to affect the West since the Second World War."

To give this book a substance beyond just recounting events that include the humorous and the bizarre, I discuss in the second part, entitled "The Ivory Is Cracked (but Not Broken), the Tower Is Leaning (but Not Fallen)," some of the darker aspects of higher education as I have experienced them. In my case, these experiences included the aftermath of the Kent State shootings, my role as a union negotiator and faculty grievance chairman in the early days of collective

bargaining on a college campus, and my wife's partner during her seven-year gender discrimination case against the university. This particular set of fashioning events forms the basis for my assessment of current trends in society as they affect higher education, and it comes from a perspective shaped by a lifetime in the educational system. With each individual the process will differ, and, perhaps for most, there will be a bit less drama, but for each of us there is a complex set of experiences that shape us, both as individuals and collectively as a society. Understanding these experiences goes a long way toward understanding how and why we function as professionals.

The several asides in this book are included to show how much rejuvenating enjoyment is involved and perhaps necessary to maintain enthusiasm while pursuing over several decades tasks that are serious, important, and have their darker sides. A reviewer of another book said that although he found the asides distracting, his students welcomed them as reprieves from what was often heavy going, and for me that was good enough reason here to keep them in.

PART I

Weaving the Fabric

Motivations

No Kidding—The National Register of Historic Places

Dow Elementary (Fig. 1) in Houston, Texas, was typical of schools in poor neighborhoods in the 1940s, and not all that much has changed during the intervening 70 years. Those schools were where teachers near the end of their careers were often sent to finish out their days. A few would be there for other reasons—incompetency, indifference, disciplinary action, and administrative sanction—because these schools were considered places where they could do little harm. Few of the students ever went to college, so the educational goals were to instill obedience, conformity, respect for authority, and a strong work ethic, along with providing practical skills like reading, writing, arithmetic, shop, and typing. The teachers also served to monitor school attendance, which was mandated through the eighth grade. Teaching skills and an in-depth knowledge

of the subjects being taught were not high priorities, and these deficiencies could leave a long-lasting legacy. In first grade at Dow, for example, those who knew their letters were called "bluebirds," and they sat at the front of the room; those who did not were called "blackbirds" and they were put at the back. The educational process was not a subtle one.

"Pop" Reddick was a case in point. As we filed in on the first day of fifth-grade arithmetic, he had his head on the desk, eyes closed, and he remained that way as first an uneasiness crept over the class and then, slowly, a stone-cold silence. Suddenly, he lifted his head, banged his fist on the desk, we jumped, and he shouted, "Percent means hundredths! That's the message of this class—remember it, even if you don't remember anything else!" Indoctrinated by that time with a strong sense of conformity, most of us complied by not remembering much else. The rest of the semester was spent grinding away at the truth of the statement without imposing the additional burden of considering what it might mean or where it might lead.

After the last morning session of fifth-grade arithmetic, Pop Reddick would open the bottom drawer of the desk, pick up a deflated football by a large hole where the laces used to be, and become "Coach" Reddick, boys' physical

FIGURE 1. Dow Elementary School (unrenovated side). The slide from the third floor extended from the row of windows on the left. Photograph courtesy of Shirley Graham.

education instructor. His role as molder of men, like that as molder of mathematical minds, was hindered by lack of even the rudiments of equipment, facilities, or support. So, like the symbolic football, the course over time slowly deflated, in spirit, interest, and effort. At the end of arithmetic class he would shuffle two blocks down Silver Street to a vacant lot next to where the City of Houston had built a public tennis facility. The football lay on the ground for the required 45 minutes of physical education while we sat around and talked or watched the players. There were girls and boys our age dressed in neat, white tennis attire taking lessons, laughing, and otherwise having a good time. That in itself was enough to prompt derisive whistles and occasional comments about sexual orientations from those "on the other side of the fence"—insecure blackbirds still reeling from the experience of first grade. After the allotted time, Coach Reddick would pick up the ball, carry it two blocks up Silver Street to school, and put it back in the drawer. "Pop" would teach three arithmetic classes in the morning, and "Coach" would teach two physical education classes in afternoon, and he did this every day of his career at Dow Elementary School.

His counterpart was the formidable, and unmarried, Miss Johnson, who was a plausible prototype for Ms. Balbricker, the women's physical education coach in the 1982 movie *Porky's*. She was, oddly enough, assigned a course in marriage counseling for girls, presumably because she could bring to it objectivity unencumbered by either knowledge or experience. Her opinions carried about the same weight of authority as recent proclamations by Pope Benedict XVI, who informed his flock that "sex can become like a drug" (Huffington Post, 2008).

The only other physical education facility was an empty half block behind the school. The girls would spend recess walking round and round on the sidewalk, while the boys would try to impress them by running barefoot over the lot covered with the mighty sandbur, *Tribulus terrestris* L. On one side of the building there was a steep, metal slide that served as a fire escape from the third floor to the ground. There were no post-school activities, but after the teachers had gone home, the more adventurous students would climb the slide, sit on folded pieces of wax paper, and experience harrowing rides out into the sandburs. Such were the facilities provided for the comparatively inexpensive physical education curriculum, and they suggest what was available for more costly library books, field trips, and the arts and sciences. These shortcomings were particularly apparent in the sciences throughout the poorer school districts. They were taken as normal in the limited experience of a fifth grader, but the deficiencies must have made some lasting impression because later, as a union negotiator in higher education, increasing the budget for teaching, research, and library services—with equitable provisions for the arts and humanities—outranked salary on my agenda.

The neighborhood served by Dow Elementary was the Sixth Ward across Buffalo Bayou immediately adjacent to Downtown Houston. It was a nonblack, but otherwise ethnically diverse, mixture of laboring-class Bohemians, Italians, and Scotch-Irish that by the 1940s included a growing Mexican population. Most of the modest houses were in the "shotgun" architectural style, meaning that there was a central hallway that ran the entire length of the structure and opened onto a backyard. On the right was a living room, dining room, and a kitchen with one corner partitioned off as a bathroom, and on the left a bedroom. "Shotgun modern" would include a screened-in back porch used for sleeping during the hot humid nights. Plantings had a decidedly practical purpose, and those at 1813 Lubbock Street (Fig. 2) included a large fig tree, a pecan tree, and an occasional garden. At some houses the gardens and associated makeshift paraphernalia covered the entire yard. These accumulations increased significantly toward rural areas outside of Houston, and the residents must have found it funny when NASA asked the people of East Texas and southwest Louisiana to examine their yards for debris after the *Challenger* Shuttle disaster of 28 January 1986.

One of our neighbors, the Bohemian Townsend family, had three daughters, and often a roomer, all of whom worked as miniskirted waitresses-on-skates at

FIGURE 2. Home at 1813 Lubbock Street. It was typical of houses in the Old Sixth Ward. Photograph courtesy of Shirley Graham.

FIGURE 3. The Silver Street Grocery, owned in the 1940s and 1950s by the Tony Giammalva family. Photograph courtesy of Shirley Graham.

FIGURE 4. The renovated building formerly housing the tortilla factory (on the lower floor, left), and the storage facilities for Rev. Louis B. Quarrles's Tabernacle Baptist Church (on the lower floor, right) in the 1940s. Photograph courtesy of Shirley Graham.

Prince's Drive-In. St. Joseph Catholic Church on Lubbock Street toward Houston Avenue was where a son, Richard Schuette, faithfully rang the bells and served as altar boy, without incident, for the early five o'clock mass. There was the small Silver Street Grocery (Fig. 3), run by the Italian Giammalva family; an even smaller grocery where a Mexican family sold tortillas and a torrid homemade salsa (Fig. 4); and a darkened shack where the enigmatic Mrs. Barns sold milk, bread, canned goods, and cold drinks. Mrs. Barns had a rough go of it because she was pathologically suspicious about customers stealing her groceries while still having to interact with the public for her livelihood. She had long, stringy gray hair, and it was rumored that she kept a gun behind the counter. Kids spent little time inside Mrs. Barns's grocery store.

My Scotch-Irish father was a laundryman who drove the Model Laundry's 1939 Model-T truck. These vehicles were started by putting them in neutral gear, turning on the key, getting out of the truck and inserting a metal rod into a hole at the front, and cranking until enough compression built up to start the engine. One feature of this design was that after the motor was turned off, it took a few minutes to decompress, and if during this time the key was turned on, the car would start without cranking. A vivid memory as a five-year-old was sitting in the driver's seat playing with the levers when the truck suddenly started with me at the wheel, and my father running frantically down Lubbock Street trying to bring it to a safe stop. A slightly later model of a Peerless Laundry truck, mercifully without the "cranking" function, was the vehicle in which I learned to drive and in which I took my driver's examination, much to the amusement of the officers administering

the test. As I drove off, one called "Have those folded and back by Wednesday."

In part of the building shared with the tortilla store, the Reverend Louis B. Quarrles of Tabernacle Baptist Church kept a hand-operated printing press and a stack of white Bibles he offered for sale on Easter Sunday. Reverend Quarrles would occasionally visit the Young People's Class and offer vivid accounts of life after death, which he vowed could come at any moment, and to remind us that even children were damned by the guilt of Original Sin—all of us blackbirds, destined for the deepest recesses of hell. A favorite hymn of the church was "At the Cross," written by Isaac Watts, that included the lyric, "Would he devote that sacred head / for such a worm as I?" The Cross could indeed be rugged and between school and church it was a miracle we didn't all end up in therapy.

Across Houston Avenue toward downtown, the city later built the Harris County Courthouse and Traffic Court, which was served off and on by bail bondsmen, pawn shops, and loan sharks. The 18% interest now charged by credit card companies (up to 30% with fees) pales in comparison to the usury of the loan sharks of the 1940s. The usual practice was to make a loan of $50 that required payments of $12 per week for six weeks for a total of $72. That worked out to be an annual rate of 380%. Many poor families during the Depression era had no alternative and were burdened by perpetual and ever-increasing debt. Although there were some better-off families living in larger houses around the periphery of the neighborhood, most of the people were just one step away from being really poor, and, in another sense, the schools were not that far away from being academically destitute. Some men in the neighborhood drank too much, many were heavy smokers, and others bet money they didn't have on the horses. A few joined the Ku Klux Klan to support the illusion that someone else was to blame.

Other strands making up the fabric of life in the Sixth Ward included the sad, the beautiful, and the intriguing. Aggie was one of the Townsend daughters who sadly slipped into alcoholism. She would occasionally be seen walking in the neighborhood, dressed in rags, conversing with the imaginary spirits of her mind. Her whereabouts were monitored and assistance provided where possible, but she was beyond the kind of help available at the time. The two beautiful Burns girls lived in the Lubbock Street house while we were living in a garage apartment at the back. They were high schoolers when I was at Dow Elementary. Sometimes they would give tame stripteases from the front bedroom while we sat on the porch and ogled through the window. Several of the houses were owned by the Gregory family, and the intriguing Alma Gregory would come around every week to collect the rent. She wore her hair cut short with sideburns, dressed in men's clothes with hat and necktie, and liked to work on cars in the driveway of our house. I used to watch and hand her the wrenches. I could never understand

why she would always laugh and say "good." It was only later I learned I was pronouncing it "wenches." With Aggie Townsend, the Burns girls, and Alma Gregory, there was a lot to observe and a lot to file away in deep memory. They would form associations with other experiences and be brought to the forefront as opinions when later reacting to the many gender issues of the coming years.

Most families in the Sixth Ward were close-knit and hardworking, and they provided a stable environment for their children. The extended family of aunts and uncles were also important and there were often close interactions with them as well. My aunt Norma was a large, loving woman who liked to enfold people in her arms. She had one child when she was young and another later in life. In the interval, I was her surrogate offspring and received a lot of attention. She often brought clothing and sacks of food over when things were tough, and her husband, Alfred, nicknamed "K. O.," would later lend me money for special needs when I was in high school and college. I couldn't understand why someone named Alfred Ringer would be called "K. O." It was because when he was young he decked someone for making advances to Norma. Earlier, when I was three or four, we lived on Bell Avenue near a large building where ladies sat and sewed clothes on long rows of Singer sewing machines. I used to stand at the window to watch, and one of them, Mrs. Reeves, started bringing me in to see closer up and to talk with the other ladies. She had no children, and occasionally would take me to a Shirley Temple movie, and once to a birthday party for her niece. She provided access to entertainment, and for the only child of Lyndon Hugh Graham and Hattie Louise Stampley Graham, associations with other children that would otherwise not have been available.

Another aunt, Josephine, provided an equally valuable resource but of a more practical kind. By the time I was in high school my father had accumulated a debt of $685 to the loan sharks that he could never hope to repay—$12 per week in perpetuity. I asked my aunt if she would give me $685 to pay off the debt, then have my father pay her back at $8 per week, for a weekly savings to him of $4. It doesn't seem like much now, but at the time the rent on the Lubbock Street house was $6 per week. She said yes, the money was repaid, and family finances improved slightly. I strode into the loan office on Caroline Avenue as an arrogant adolescent, pulled $685 in cash from my pocket, and told the surprised ferret-like creature behind the counter not to contact my father again. He smirked and then called out as I left, "Hey, kid. We didn't contact him. He contacted us." The point was taken, and another strand—this one about the advantages of financial solvency—was added for future elaboration.

Another aunt, a feisty little woman just under 5 feet tall named Lois, was also into the practical side of life. As an 11- or 12-year-old I used to cycle to her house

on Bingham Street for visits. Her husband was a colorful and bodacious Cajun named Pierre Deo LeBlanc. Although named for a saint, God, and purity, he was none of these and was often absent on long trips as a seaman in the merchant marines. He used to tell mesmerizing stories about their ship sitting for days in the North Atlantic with all the engines turned off, and no one moving or talking, to avoid the sonar of German submarines. My task on the visits to Bingham Street was to walk the assorted dogs he left behind for Lois's protection. The animals had been taunted to viciousness, and a Chinese chow with a disgusting purple tongue was particularly aggressive. I used to hold the leash out and straight up so he couldn't bite. Instead he growled incessantly and over a week or two would chew the leash into tattered shreds. Later, Lois got two boxers that spent their leisure assailing one another and often had to be separated with buckets of water. When Deo was home they had a series of small, bug-eyed, snippy, physically altered, genetically modified, neurotic aberrancies that spent their time shaking in the corner of her chair. It colored my attitude toward pets, and the bucolic Norman Rockwell images of a boy and his dog seemed like lunacy.

An incident in Deo's past contributed another strand to my ever-increasing complex of attitudes toward religion. He walked with a slight bend because as a child he was kicked, literally, out of church by a parish priest. The blow landed on his lower spine, and it was a lifelong reminder of the benevolence of the church. By this time I was becoming suspicious of earthbound, money-seeking, self-appointed interpreters of God's word and of the conflicting messages that were inevitably resolved by the panacea, "The ways of God are not meant for the minds of man."

Lois's quest to achieve a respect not readily accorded to women in the workplace, especially one of her diminutive stature, was through savings and unrelenting hard work. She was employed for 45 years by the Gulf Oil Company and often said that her goal was to reach an annual salary of $10,000. She never achieved it, but throughout her career she purchased Gulf Oil stock and with it bought 13 acres of land on Airline Road where the county later built the regional airport. She died content knowing her assets had accumulated to over a million dollars. These goals, framed in dollar amounts, were important to her as a sign of success and a certification of self-worth. It gave her a feeling that she could retire with nothing left to gain and nothing left to prove. She worked for an adequate salary at a satisfying job and achieved wealth because she learned the basics of long-term conservative investment. Her success ultimately strengthened the strand that was imparted earlier by the Caroline Avenue loan sharks.

Among my more flamboyant relatives were Bonnie and Harry Kirkpatrick. They wre evangelical Pentecostal preachers of the most vocal sort called "Holy

Rollers." At family reunions they offered marathon graces that could go on for half an hour or more. First, Bonnie would circle the table proclaiming what sin-laden, undeserving human debris we were, lost to an eternity in hell but for the grace of God. This was the same God that Reverend Quarrles said had ordained his people to "Go ye after him through the city, and smite: let not your eye spare, neither have ye pity: slay utterly old and young, both maids, and little children, and women . . . fill the courts with the slain" (Ezekiel 9:5–7), which seemed to directly contravene the Sixth Commandment given in Exodus 20:13. It was becoming ever more confusing, but we were continually reminded that God's ways, as interpreted by His confidants on Earth, need not be understood but only obeyed ("God came to me in a vision last night and revealed . . ." was a favorite Quarrles expression and a near weekly occurrence). During our own tribulations with ever-lasting grace, Bonnie would eventually sit down and Harry would take over to joyously revel in the draconian events about to befall us all. It was reminiscent of the message Elizabeth preached to her son, Samuel F. B. Morse: "The main business of life is to prepare for death" (McCullough, 2011a: 77). They alternated until some adults mused that an eternity in hell might not be so bad. Deo came to one reunion, occasionally muttering "Jesus," which the Kirkpatricks mistook as a promising step toward his salvation. Religion, like financial success, was emerging as important, but not the extreme versions practiced by zealots—defined as those blindly committed to a cause (e.g., "respect the sanctity of life") but having forgotten the point ("even if it means wiping out every vestige of opposition").

Altogether, life in and around the Sixth Ward offered ample role models for success and for mediocrity, along with a wide range of temptations, all concentrated in a very small area. One could walk a few blocks in one direction and be among minor criminals, prostitutes, and derelicts that occasionally slept under the Capitol Street Bridge, or one could walk a few blocks in another direction and see white-clad tennis players sitting in an air-conditioned clubhouse. Mr. Straus lived in the exclusive Warrick Hotel and parked his Cadillac in back of the courts. Gladys and Julius Heldman moved to Houston from New York, and Gladys had a set of horns from the famed Texas Longhorns mounted on the hood of her convertible. Incredible as it seems now, Robert Straus and Gladys Heldman used to let me drive their Cadillacs around Houston while they played tennis—an improbable upgrade from the laundry trucks. Karl Kamrath, Sr., a prominent Houston architect, lived in the exclusive River Oaks section of town, and he and his son Karl Jr. occasionally played at the Houston Tennis Courts as well as at the River Oaks Country Club. Many young players who later toured the state and the country playing in tournaments, even attending college on athletic scholarships, were sponsored by the Straus, Heldman, and Kamrath families and other patrons

of the Houston Tennis Association. It was an eclectic neighborhood.

Dow Elementary School also offered contrasts of an academic sort, although they were experienced more by chance than by choice. The fifth grade was a watershed period in a student's life because it was when letters began segueing into sentences and writing and numbers into arithmetic and math. A decisive factor in stimulating interest in any subject was whether by luck of the draw the teacher happened to be capable and still energized enough to provide motivation and a convincing rationale for doing well. At Dow Elementary School in the 1940s there were several who were skilled and dedicated enough to impart a lifetime of motivation. Most were in the humanities and one in science. Mrs. Jackson taught English, and her quest, through the method of "diagramming sentences," was to teach the parts of speech and show how words fit together into grammatically correct and effective sentences—the art of syntax. Stanley Fish, in *How to Write a Sentence*, describes the lifelong benefits to readers and writers alike of mastering or at least recognizing the ability to express thoughts and technically complex ideas with verbal skill: "Some appreciate fine art; others appreciate fine wines. I appreciate fine sentences. I am always on the lookout for sentences that take your breath away . . . that make you say 'Isn't that something?'" (Fish, 2011: 3). In a clever ruse, unrecognized at the time, teams were chosen and contests held to identify every part of speech in sentences that just happened to be taken from the world's great literature.

Miss Weaver taught music, and her forte was to stimulate an appreciation of classical music (Mithen, 2007) while avoiding counterproductive judgmental assessments about what was "good" or "bad." Rather, she casually introduced the notion that some music had been around for many decades, even centuries, and had been filtered through the passage of time. It was often composed, conducted, and performed by exceptionally gifted people called prodigies who, even if gifted, had to dedicate a lifetime of study and practice to produce this music. When she occasionally played the hand-clapping, toe-tapping popular music of the day she noted that it was a lot of fun. As an accompaniment it usually could be played using just three chords (C, G, and D), and if we liked it we should listen well because much of it would disappear after a few months. Occasionally she would play a particularly poignant aria by a tenor like Jan Peerce and note, "Just think, he can do that without a microphone, in a small recital hall or in a stadium, over an 80-piece orchestra . . .with just that voice." And she left it at that. Sixty years later I still recall that thought and get a similar feeling when I hear or read an idea expressed honestly and effectively "with just those words." Indeed, "isn't that something?"

Mrs. Gibson was appropriately long and tall and taught Texas history. With

her we fought the Battle of the Alamo, celebrated Sam Houston accepting the surrender of Santa Anna at San Jacinto, and lived under the Six Flags of Texas. However, she subtly wove in the broader message that knowledge of the past is helpful for understanding the present and planning for the future, local history can best be viewed in the context of regional and global events, and that the "good" guys and the "bad" guys of history depend in part on who is telling the story. For many in her class, the dates, names, and places were forgotten, but later experiences continued to reinforce the wisdom of these broader messages.

Mrs. Mueller probably had it the easiest because she taught general science. Whenever attention drifted, she could refocus it by noting, for example, that it was 93 million miles from the Earth to the Sun and then have us try to calculate how many fifth graders it would take laid end to end to cover the distance; or, that the rocks and fossils at the bottom of the Grand Canyon were millions of years old (2 billion years for the basal Vishnu Schist), and, assuming each page of our book represented 11 years (our "entire life!"), let us figure out how big the book would have to be to equal the age of the rocks and the fossils; or, to a chorus of snickers, giggles, and racy comments, tell us that later in biology we were going to talk about some of the differences between boys and girls. The latter discussions never lived up to expectations, but they were looked forward to with great anticipation, and they were probably more enticing than what was being discussed in Miss Johnson's marriage counseling class. Of enduring value was how Mrs. Mueller avoided presenting science exclusively as a litany of facts and figures, instead demonstrating it as a way of understanding things by observation and experimentation unfettered, to the extent possible, by prejudices, wishes, blind obedience, and preconceived notions.

The construction of the Houston Tennis Courts was a significant event for the neighborhood and in the lives of several of its younger residents. It provided opportunity for after-school activities unavailable elsewhere in the Sixth Ward, and several of us who lived within a few blocks of the facility—Sammy Giammalva, Richard Schuette, and I—began hanging around the courts (Fig. 5). Important for us was the guidance, encouragement, and other intangibles offered by the club's professional, Robert Nesmith, and, essential for some, the free lessons. Later he was instrumental in getting Wilson and Spalding to provide free equipment to Sammy and me in return for our using their brands in tournaments. He was one of my "chance encounters" that would have such a beneficial influence.

Other young players came in from elsewhere, including Karl Kamrath, Jr., Charles Russo, Ann Farmer, Betty Gray, Edith More, and Jane Zimmer. Perry Matluck worked for Encyclopedia Britannica and moved to Houston from the East Coast. We found it funny he called his son "Harv" but found nothing unusual

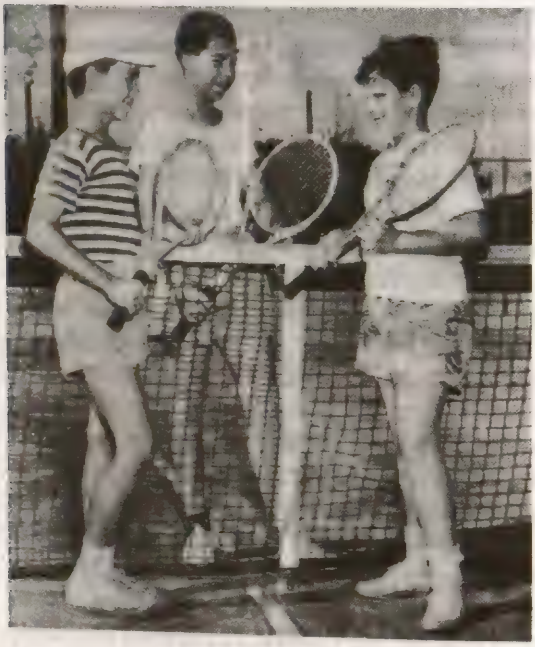

FIGURE 5. From left, Sammy Giammalva, myself, and Richard Schuette at the Houston Municipal Tennis Courts in the Sixth Ward, 1946.

about names like Billy Bob. Harvey Matluck was a good player and was readily accepted into the group. When the Houston Tennis Association sponsored me on a tour to California, I went with Bill Berryman in a car a relative lent him for the trip. It was a coupe, and by removing the back seat we could put a mattress in from the trunk, and that's where we slept most nights on the trip. One night we pulled off the road in the dark, unaware we were parked virtually on the tracks of the Southern Pacific Railroad. We were awoken around midnight by the train hurling past virtually inches from our car. The car broke down in Bakersfield, where we got a lesson in the ethics of the automobile repair business. It was a Friday and the mechanic, who owned the adjoining café and motel, immediately disassembled the engine and then informed us that the needed parts would not be in until Monday. We eventually made it to the Ventura tournament and the Los Angeles Tennis Club, and all in all it was an exciting and broadening educational experience.

Another trip seems almost foolhardy from the modern perspective. At age 17 I went to the Greyhound bus station—a way station for vagrants and second in reputation only to the men's room at the YMCA—and took an overnight bus trip to St. Louis. I played in the National Indoor Tennis Tournament at the old National Guard Amory, reached the quarterfinals, and received a national

ranking in the Juniors Division. Sammy Giammalva and I also had a ranking in doubles from the national tournament in Kalamazoo, where we were defeated in the quarterfinals by Richard Sagebiel and his partner Barry MacKay, who later became the television sports announcer for national and international tennis events. These results played a large part in our later receiving athletic scholarships to the University of Texas.

An event that consistently struck terror in the hearts of boys at the time was the dreaded senior prom, where we would have to—dance! Betty Gray mercifully gave some of us a "just get me through this" dance lesson at the tennis courts the day before the prom. The choreography consisted of imagining a square on the floor and starting at one corner, moving successively to another corner, take two steps, and repeating the square. Although unimaginably restrained by modern standards, it had the advantages of a reassuring predictability, could be done (or at least was done) the same way to all music, and required a remarkably limited amount of space. This was important because it would have been disastrous to bump into another couple and throw off the boy's almost audible metronomic counts of "step-one-two." The dance lesson served for two proms, was never used again, and earned Betty Gray the undying gratitude of the young and the desperate.

All in all, the group was a diverse one of 11- to 18-year-olds, including the very wealthy and the very poor residents from River Oaks and the Sixth Ward, from prestigious schools and financially strapped ones like Dow Elementary. Those from other neighborhoods gathered there because it was the most active center for tennis in Houston, and for everyone there was some source of pride, either in athletic ability, wealth, academic excellence, or reputation of their schools. Since no one had it all, that put a brake on arrogance, and we interacted through a shared interest, in this case tennis. Social status, ethnicity, or gender never seemed to enter into it.

Johnny Rutherford maintained the courts, and he was a favorite of the young players because he let us help, he was jovial, and he had an Indian motorcycle. I used to ride with him down to Galveston and to other Texas cities and once even to San Antonio to play in a tournament. Some players at the Houston courts would take us on as doubles partners and play among themselves for hundreds of dollars a set. Another inevitable part of the tennis scene was the offer of rackets, clothing, and other gifts from older men who came to the courts to play and watch. I got dinner invitations to the prestigious Cork Club at the Shamrock Hotel, lunch in the Gentlemen's Dining Room at Foley's, and even an offer to go on a private yacht cruise to Cuba—all very impressive to a 17-year-old. In retrospect, it is clear that other adults at the courts were keeping an eye on things, and from questions asked by my family, and especially by some

rough and tumble uncles, they were, too. Deo was a battle-seasoned seaman in the merchant marines in World War II, and Bill Terry, Josephine's husband, was a barge captain on tugboats in the Houston Ship Channel. At the first hint of anything unseemly there would have been a terrible retribution. However, the really memorable thing about these encounters was that there was never an incident. The men had their own circle of friends and were friendly, generous, supportive, educated, intelligent, and successful. They enjoyed being part of the scene, and like social status, ethnicity, and gender, their preferences never seemed like a big deal.

I worked after school as a delivery boy for Kenneth Gant's Huston's Drug Store (Fig. 6) at 25 cents per hour. He was impressed at how fast I was able to make deliveries—unaware that on the longer runs I was traveling a dizzy 20–25 miles per hour down Washington Avenue on a Schwinn bicycle holding on to the back of trucks. The worst task in the store was to reset the counter stools at the soda fountain when the bolts came loose. It involved removing the old bolts at the base of the stool, putting another in the hole with the head down, heating sulfur until it melted, and pouring it into the hole. Working with molten sulfur is a dangerous job, notwithstanding Mark Twain's observation that the odor is not unpleasant to a sinner. The stool was set over the bolts, the nuts added, and when the brew cooled it hardened like cement. When I asked why we just didn't use cement, Mr. Gant said it was tradition. I recall almost the exact words at Kent State University in the 1960s when observing that only men held the full professorships in biology and every administrative post at the university except those in education, home economics, and nursing. It was tradition. Strands contributed later at Kent State and by Lois LeBlanc, Myrna Kimmons, Emma Long (see later discussion), and other capable women were further shaping my viewpoint on gender. As the number of women was rising over 50% of our population, placing obstacles to their full contribution seemed absurd.

One of our customers at the drug store was a family that owned the Glenwood Cemetery. They lived in a house about half a mile down a dark road into the graveyard. We closed at 9:30, and every Thursday night like clockwork at 9:25 they would order one pint of hand-packed ice cream. Hand packing rock-hard ice cream was a chore in itself, and, for a 12-year-old, riding down a cemetery road at night with nocturnal creatures darting out from behind the tombstones was hardly compensated for by the five-cent tip. Even so, there were perks to working at the drugstore. One was that the employees could keep the out-of-date paperbacks, and almost every night my father and I would read them. Reading has always had a pleasant association, and the year at the drug store proved useful later in getting summer jobs at the University of Texas.

FIGURE 6. Huston's Drug Store on Washington Avenue. Photograph courtesy of Shirley Graham.

After Dow Elementary School, most students went to Sam Houston High School. Almost everyone walked the eight to 10 blocks across the Capitol Street Bridge over Buffalo Bayou to the school, located virtually in the center of Downtown Houston. Like its elementary school counterpart, it was the poorest of the city high schools, lacking the most basic facilities, except for a well-equipped woodworking shop and lots of typewriters for the secretarial training class. The "gym" was a vacant asphalt courtyard in the center of the U-shaped building. At Sam Houston High School, Mr. Hudgings's Spanish class was especially popular with the native-speaking Mexican students. For the rest of us it was a practical introduction to the meaning of "curve breakers."

There were some early lessons in adolescent psychology. One of the students in my first grade class was a tall (for our age), beautiful (by any standard), and very bright girl named Myrna Kimmons. We were in the same class or homeroom from first grade through the 12th grade and graduated in Sam Houston's last class in 1952. We were somewhat competitive, but she had the edge, making an A on virtually every examination in almost every class. At Dow Elementary, when pictures and articles started to appear about my tennis activities, there were taunts from some of the pseudoroughs about what was going to happen

on the way home after school. A short, blocky little would-be kingpin named Rudy was particularly annoying. It was the usual adolescent bluster, and since I lived less than half a block from school, there was never a problem. Even so, it was satisfying when three events sealed the fate of Rudy the Ruffian. One was that among our group, John Allen Wood was impressively big, strong, and always ready (perhaps even eager) for action if the need arose. There was the ever-present possibility he would step in if the tough's talk got too bothersome, or in the unlikely case they actually ever did anything. With that threat looming over them, they never did. Another student was Karl, who was an epileptic. He once had a seizure at school and forever after was teased and berated mercilessly by the ruffians and associates. Karl was incredibly patient, but one day on the far side of the grounds beyond sight of the teachers they apparently crossed some line. It was an unexpected and very dramatic moment. Karl slowly turned around and faced his taunters in a boxer's stance. That in itself was startling because most fights at school consisted of threatening verbiage and randomly flinging at the air while hoping the bell would ring and break things up. The toughs predictably started backing away but Karl had his eyes fixed on the leader and with one blow sent him into the ditch dazed and much improved.

The other event involved my much-admired and ever-present academic nemesis, the quietly confident and serene Myrna Kimmons. One day when the teasing was at a peak, Myrna unexpectedly asked me to walk with her around the grounds during recess. Being "with" her upped my stock considerably, the teasing leveled off, and Myrna went back to her pursuit of excellence. The benefits of associating with capable people of good quality were becoming clear, as well as something quite pleasant, in ascending the social and academic ladder.

Another experience involved a mainstay of the local high school scene, Herman Singletary. Like Myrna, he was an A student and a member, officer, or president of almost every student organization at Sam Houston. He and I were selected as candidates for the city's Outstanding Young Man of the Year Award given by a local civic organization. We were invited to a banquet and had to give a brief talk about our achievements. I went first and talked mostly about my tennis and scholastic record, then Herman got up and talked mostly about my tennis and scholastic record, and they gave the award to him. A generosity in acknowledging the success of others was also emerging as something important. It eventually was woven in with other strands to form a viewpoint—that achievements and the recognition of those achievements by others are important because if we are successful or perceive ourselves to be successful, it allows us to revel in the success of others. The corollary is that if we are unsuccessful or perceive ourselves to be unsuccessful, it makes us resent the success of others,

and that can constitute psychobaggage of considerable weight. Recognizing this is especially important in teaching, and it was realized by teachers like Vera Gray at Sam Houston High School (see later discussion).

One similarity between the Dow and Sam Houston schools was that the same broad range existed in teaching quality, commitment, and skills. A noticeable difference was that many of the "difficult" students had filtered out by high school—there was no requirement to attend school beyond the eighth grade—so the academic spirit of the place was almost upbeat. Especially evident, in hindsight, was the realization by teachers that many students came from academically poor schools and financially poor neighborhoods. Thus, these teachers viewed encouragement and recognition of student achievements as an important part of the educational process. For those benefiting from academic and athletic success, such recognition was already coming. Hardly a month went by that we were not mentioned in the Houston newspapers or at Sam Houston High School in announcements over the school's public address system. Among the general student body most were not overly impressed by the notoriety because they were achieving recognition in their own right or were working as interns in some of Houston's most prestigious corporations as part of the Distributive Education (D-E) Program. Surprisingly, the basketball team under Coach Roy Dealy was the best in the city—Eddie Ashwood, a 17-year-old, was an awesome near 7 feet tall. Even so, when a tennis player, of all things, was given full-page coverage in the school's yearbook, the *Cosmos*, there were blusterings about the unfairness of life from the "real" athletes. Nevertheless, the overall reaction to all student achievements by peers and teachers was supportive. Imagine the lasting impact of comments like those of English teacher Mrs. Vera Gray:

> It is with inestimable pride that I am permitted to place my signature in your book that symbolizes years of diligent application in order to achieve and excel. May your college career be happy and fruitful, and do not forget one who will always be interested in your success.

It was a potent launch into the real world, a deep reservoir to draw on in difficult times, and an especially instructive model for teaching.

Legacies

So what came to pass for the school, the neighborhood, and the students from this environment? Dow Elementary School was built 100 years ago in 1912. Its future depended on whether the people of the neighborhood would keep the school and its surroundings from deteriorating to a point of no return and whether they

would be supportive of efforts to find an alternative use for the building when, inevitably, it could no longer serve as a school. Recall that during the school's history the country had gone through a severe economic depression, two world wars, racial integration, civil strife, widespread decay of the inner cities, and white flight. For example, the 1967 population of Detroit dropped by 50% (Sullivan, 2009), and in St. Louis, once the nation's fourth largest city (now the 52nd), the population went from ca. 900,000 in 1950 to around 319,000 in 2010 (Campbell, 2013). The answer to urban decay was to demolish buildings and neighborhoods and build vertically sprawling housing projects, like the nearby San Felipe Courts, that often became the slums of the future. Furthermore, through all this, Dow Elementary School was sitting on real estate located four blocks from Downtown Houston—one of the fastest growing metropolitan areas in the world.

In contrast to many urban areas in large metropolitan cities, the enduring physical soundness of the school and the social activism of the people prevailed. Pleasantly surprising, even astonishing to many of us who went through the system, Dow Elementary School is now listed in the National Register of Historical Places.[4] It is being renovated as the home of MECA (Multi-Cultural Education and Counseling through the Arts; Fig. 7), an organization serving at-risk youths and their families (Houston Chronicle, 2006; MECA, 2011). Considering that presently 7,000 students a day in the United States drop out before finishing high school, it is a facility of inestimable value. Furthermore, the Old Sixth Ward is now the first Houston neighborhood listed in the National Register, and it was designated a Historic District by the City Council in 1998 (Figs. 8, 9). As a result, many homes and buildings are now being restored (Fig. 10). It is Houston's only Protected Neighborhood—a fitting tribute to the solid core of families who built on the past to improve the future.

As for the young residents who lived locally, or who came in from other neighborhoods, some worked at the tennis courts, learned from the adult players, traveled to tournaments across the country, and eventually earned scholarships to the University of Texas and other schools. For Richard Schuette, Charles Russo, and me, tennis was a means to other ends—Richard and Charles became medical doctors, and, after Texas, I went on for a Ph.D. at the University of Michigan, spent a postdoctoral year at Harvard, and became a university professor. Sammy Giammalva was the best player among us, later playing on the United States Davis Cup Team. Altogether, it was a rather surprising concentration of professionals coming from so small and modest an environment. Perhaps the overriding significance of all the experiences, however, was that a potentially limiting and provincial existence, confined early on to a few square blocks of the inner city, was transformed into unimagined opportunities and a wider worldview

FIGURE 7. Dow Elementary Park and School, the new home of MECA (Multi-Cultural Education and Counseling through the Arts). Photograph courtesy of Shirley Graham.

FIGURE 8. The sign at Washington Avenue and Silver Street now designates the neighborhood the "Old Sixth Ward Historic District." Photograph courtesy of Shirley Graham.

FIGURE 9. The plaque designating the Silver Street Grocery as a property on the National Register of Historic Places. Photograph courtesy of Shirley Graham.

FIGURE 10. A renovated house in the Old Sixth Ward. Photograph courtesy of Shirley Graham.

by chance encounters with solidly grounded, exceptional people. The Sixth Ward experience showed that important strands are contributed to the human fabric not only by the words and deeds of family and friends, but also by political, religious, and business leaders and educators. Acts and utterances—whether from the political ultra-Left or the ultra-Right; religious fanatics or rational believers; those interested in accruing wealth, importance, and attention without concern for the public good; or those providing responsible leadership—they all make an impression on the young. The impact may be positive or negative, but there is always an impact, and it is remembered because it comes from those respected at the time, perceived early on as authority figures, and functioning, even if unintentionally and involuntarily, as role models. The actions of prominent individuals, or vocal segments of the general population, show to the young the way things are done in "real" life; how to get ahead; what constitutes acceptable behavior; and what is "cool." The accumulation of these impacts over time shapes the individual, and, collectively, they define the public attitude toward government, church, industry, businesses, and the professions. Current conditions in all these fields document the obvious need for restraint in what is being said and reforms in what is being done, and it is increasingly clear that this should come sooner rather than later.

University of Texas Tower, Austin. Photograph courtesy of Tom Wendt.

Education Big Time—Texas

It is generally acknowledged that environment (people and experiences) acts on genetics, with an overlay of luck and chance, to shape personality and human qualities. In large measure, these fundamentals are in place by high school, if not long before. Professional traits are mostly added later and are influenced by the quality, standards, and reputation of the school and its faculty. The importance accorded to teaching at the undergraduate level (e.g., whether senior faculty are in the classroom), the methods used by the faculty for instruction at the graduate level (e.g., a seminar format with mostly student presentations; primary responsibility for teaching assigned to graduate and postdoctoral students), and the breadth, timeliness, and sophistication of the school's research programs are also critical. More subtle but perhaps overriding all of these are the student's

chance encounters with individuals who stimulate interest in a subject and who inevitably serve as models for molding professional goals and attitudes. All who enter the professorial ranks will be among these, and the way we play our roles reflects the complex interactions between our early defined personalities and our later defined professional selves.

Some students entering college need considerable guidance and encouragement. Others come with a defined agenda and look to the institution primarily as a place for training to achieve these goals, to hone their skills, and to serve as a platform for launching themselves into the competitive upper echelons of their particular field. Most fall in between, depending on the early influence of teachers, family background, traditions, and their own self-motivation. Goals and circumstances may change during the tenure of instruction, and there is a wide array of institutions suited for each clientele, from local junior colleges, online technical colleges, and small, prestigious undergraduate teaching colleges, to large mega-universities with international reputations in research where the need for independence and self-motivation looms large for the undergraduate. Most universities provide both instruction and research experiences, but with different emphases and with varying degrees of success. In all cases, however, the nature of the institution and encounters with its faculty always play a role in shaping the end product. Therefore, it is worthwhile for faculty members to recall that early events and experiences went into making them as persons, and later ones went into making them as professionals. Recognizing this should impart some flexibility in an educator's mien and engender the realization that periodically adjustments in personality traits and an assessment of values and attitudes will likely be necessary, especially in these rapidly changing times.

This section on motivations explores reasons why some faculty members choose to undertake projects not directly related to research and not required by the job description. For me, these projects included mentoring a nearly defunct undergraduate biology honorary society, establishing an undergraduate assistantship program, and developing courses in biological field studies in Mexico and the American West. Reasons for undertaking such projects derive from both the early "personalizing" phase and the later "professionalizing" phase that occurs at the undergraduate, master's, doctorate, and postdoctoral level. They determine, in a sense, what kind of professor a person is going to be—not of botany or geology, but what "kind" of professor.

My experiences and encounters at the University of Texas relevant to these motivations were even more eclectic than those at Dow Elementary and Sam Houston High School; they were also on a grander scale and at a more rarified intellectual level. The tennis coach at the University of Texas was the ancient

and venerable Daniel A. Penick (1869–1964) after whom the NCAA Tennis Championship Trophy is named.[5] At the time (1952) he was 83 years old and could hardly see the players, but that did not deter him from driving each day to the courts located on the grounds of the university football stadium. It was understood among the ground crew that at one o'clock each day someone would open the gate in the chain-linked fence that enclosed the stadium. One day the gate was not opened, and Penick crashed right on through, heading for his usual parking place by the courts. For a coach he had a singularly improbable background. He was a classical scholar with a Ph.D. in Greek, Latin, and Sanskrit from Johns Hopkins University. His dissertation was "Herodotos in the Greek Renascence," and he taught New Testament Greek. This gave him great empathy and patience with players who pursued academic interests occasionally at the expense of athletics.

Fortunately for all concerned, his assistant was a legendary player named Wilmer Allison (1904–1977).[6] He had won the Southwest Conference and NCAA championships, two doubles titles at Wimbledon (1929, 1930), and reached the finals in singles at Wimbledon, losing to Bill Tilden. He was the top player in the United States in 1934 and 1935, won the U.S. Open Championship at Forest Hills in 1935, and played on the Davis Cup team from 1928 to 1937. Wilmer Allison was also a colonel in the U.S. Army Air Corps, and he liked to drink. Some days both he and Penick had trouble seeing the courts, but together they were a formidable team. Penick's teams almost always won the Southwest Conference, along with two national singles titles, and Allison continued the tradition by winning four Southwest Conference Championships. After seeing me play at the Caswell Tennis Center in Austin, he offered me a scholarship to the University of Texas that included room, board, tuition and fees, books, equipment, and travel. It was a defining moment because prior to that my options were to live at home and go either to Rice Institute, at the time primarily for engineers, on a partial tuition grant, or go to the University of Houston with no support and work as caretaker at the courts.

The University of Texas was the premier school in the southwest with a strong undergraduate teaching program and an emerging reputation as an international center for research. My interest in tennis waned after entering the university—the sport had served its purpose, and other players were more talented. I was interested in academics, and I had to devote most afternoons to laboratories. Early on, I spent a lot of time making up for the long-lasting, marginally adequate background in science provided by Dow Elementary and Sam Houston High School. I had to give up the athletic scholarship for one year but ultimately ended up back on the team and graduated with honors. Daniel A.

Penick and Wilmer Allison were among a growing cadre of exceptional people I encountered, and they were supportive throughout my early undergraduate days at Texas. In particular, they followed the lightly traveled path at large universities of individualizing students to determine what was in their best interest—a singularly invaluable trait in teaching and an essential one for distinguished teaching.

Before freshman classes began, everyone took tests designed to help counselors advise students about majors. In a result that colored my attitude forever about measuring "aptitude," I scored high enough on the math and science section to be offered a four-year academic scholarship to the College of Engineering, but I would have to give up the athletic scholarship. It was a surprising test result because no one in my family was remotely associated with engineering; instruction in mathematics, physics, and chemistry was singularly poor at Sam Houston; and I was not even sure what an engineer did. However, like Miss Johnson and the pope, I approached the subject with an objectivity unmarred by knowledge or experience and majored in engineering but kept the athletic scholarship just in case. After the first semester of engineering drawing it was manifestly clear that this career was not for me regardless of the tests.

I was also recruited to join a fraternity, Delta Kappa Epsilon, which had a lot of the "right kind" of athletes like golfers, swimmers, and tennis players who later would fit in at the club and did not sweat too much. In addition, staying off scholastic probation for a fraternity was based on the grade average of the entire membership, so a few well-placed pledges with decent averages could offset those with other interests. Fraternities were big at Texas, and some of the houses were the size of small mansions. One goal was to promote proper social skills in dress, manner, and conversation by hosting dinner dances for the various sororities. I was wary of the dances and by the fact that an unspoken goal was to bring together tycoons-in-training with suitable females from good Texas families to look one another over for possible future matrimony. In addition to rehearsal dinners with an assortment of silverware and crystal glasses, we were given a set of questions to ask if sparkling conversation started to wane. On my list was, "What would you be doing if you were not at Texas?" The girl I was with was a pleasantly chirpy education major whose eyes would periodically flutter and enlarge to alarming dimensions. She said she had always dreamed of being a Kilgore Rangerette cheerleader. It seemed a suitable goal, and sororities and fraternities have their place, but it was not for me. I also seemed to be developing an aversion to large, noisy gatherings and impatience with repetitive, banal, disconnected conversation fragments about weather, shopping, summer vacations, parents who just don't understand, and the deplorable deficiencies of siblings—possibly facets of the much-debated only-child syndrome (lonely,

overachieving, neurotic, spoiled brats). However, it is reassuring that no less an authority than writers for *Time* say we are just fine (Sandler, 2010). Acknowledging these traits was useful later when I faced the choice of coping with the unappealing politics of a career in administration or to continue in teaching and research. These early experiences showed clearly that administration was not for me. They also revealed that anyone can be an administrator, but far fewer can be competent administrators. This is important in the complex world of higher education, where indecisiveness and wrong decisions can do real damage and have deep, long-term consequences (see Chapter 5).

While at Texas I also ventured into the military via the university's ROTC program. The specter of the draft still hung over young men in 1952, and there were two ways to increase the chances of completing four years of school. One was rather nebulous and involved maintaining at least a B average while majoring in an essential service (essential in the sense of military needs, such as science, engineering, medicine, nursing, or pharmacy). The other was to enter the ROTC program and be assured of four years of college, but with a commitment to 18 months of postgraduate military service. There was a lot at stake, and not knowing how grades were going to turn out, I decided to hedge my bets by majoring in pharmacy and joining the ROTC for a semester. Never missing an opportunity to harass freshman, the upperclassmen in the athletic dorm told us that if we ever dropped ROTC that was equivalent to going AWOL and we could be sent to prison. That was suspect because they also told another freshman, straight from the cornfields of Kansas, that if his fiancée used Tampax it meant she was not a virgin and had been sleeping around. It eventually all got sorted out, but the decision to enter the ROTC program was a disaster surpassing even that of engineering. The difficulties began early when a dress parade was called for the nearly 800 cadets in the late fall of 1952. The dress code—whether we were to wear winter wools of olive green or summer khakis of light cotton—was posted on Tuesday before the Thursday inspection. In Austin, temperatures could vary considerably over two days in the fall, and although the dress was posted as winter wools on Tuesday, it was over 90°F by Thursday noon. It seemed inconceivable that any rational person would be expected to march for an hour on the field of a football stadium in 90° temperature dressed in a heavy wool uniform. Such was the case, however, and there was no way for one cadet in light khaki to avoid being noticed among 799 others dressed in dark green. Another misadventure occurred during an inspection of our M1 rifles. As the officer approached, the cadet was to come to port arms and pull back the lock on the firing chamber so the officer could look in to see if it was clean. When he moved on to the next cadet, we were to release the pin in our rifle and return to

attention. It was a split-second maneuver, and when the pin crushed down on my thumb, I made an inappropriate comment, and another round of demerits was added to an already suspect record. Other demerits were added when I inadvertently referred to the rifle as a gun and grimaced when a regular-army sergeant called me "soldier." The culmination came, however, when I swung my leg over the low chain fence around the drill field and broke the rifle in two on a cement post. The regular army sergeant in charge of ordnance was aghast when I brought in the rifle holding the stock in one hand and the barrel in the other, connected only by the shoulder strap. By this time it seemed likely that grades were going to be manageable, so I dropped ROTC to the relief of all concerned and entered the pharmacy program as a sophomore in the fall of 1953.

The choice proved eventful because the first two courses in the curriculum were pharmaceutical Latin and pharmacognosy—the study of medicinally important plants. I found the subject interesting and did well, partly because one of the questions on the final was to identify the source of a quotation etched in the lintel above the entrance to the University of Texas Library: "And you shall know the truth, and the truth shall make you free." I was one of a few, perhaps the only one, who knew that it was from the Bible, John 8:32. The instructor seemed astonished that anyone knew the answer, and that bit of arcane information served me well in my first course in botany.

An advantage of being the first from a family to go to college is that there is no pressure to select a major based on tradition. A disadvantage is that so many things seem interesting, and there is no advice on the difficult task of how to pare these down and make the one and only proper choice. It is a subtle procedure and, for many students, an agonizing one because it seems so arbitrary. In reality there is no one and only choice, and there is rarely a flash of light, like that experienced by Paul on the road to Damascus, revealing a predestined course of action. Rather, experiences like those with engineering, ROTC, and fraternities serve to eliminate choices unsuitable for a particular individual. That leaves a cadre of suitable fields, any one of which, after deeper involvement, will usually be regarded as an inspired choice. The decision is often the result of becoming familiar in-depth with a subject, encountering a special instructor, or is necessitated by a deadline for signing a form, declaring a major, or applying for fellowships limited to majors in a particular field. My experiences going through this process were valuable when later I had to advise graduates and undergraduates who felt in a similar predicament about their career choices.

One problem with scholarships is that usually they do not continue through the entire year. When the athletic scholarship ended for the summer, money ran out, and with no funds available from home, this required a significant adjustment

in lifestyle. At the financial nadir of late summer, the long weekends were survived by holding off eating as long as possible, then consuming half a Milky Way candy bar and half a can of warm Pepsi for a total cost of 25 cents. The carbonation of the Pepsi and the whipped fluff of the candy would swell up and give the sensation of being full. The other half was eaten as late as possible on Sunday, and another weekend was survived for a quarter. Although most students went through the university under better financial circumstances, there were others who could afford to take only one course a semester, go one semester a year while working full time, or were ex-GIs with families, all requiring many years of determination and sacrifice to complete a degree. In that context, my situation didn't seem particularly difficult or even noteworthy. It was something done to survive the moment and to continue moving through the education process toward what seemed like the logical end point, which was the Ph.D. degree.

Another problem I encountered at Texas was that freshmen athletes had to live in a temporary barracklike annex across from the upperclassman athletic dormitory at Hill Hall. It was flimsy and noisy, and nothing short of communal rioting took place until after midnight. A previous resident had written on the wall "In an athletic dorm seven things can happen to freshman and eight of them are bad." The football players coming in bruised and bloodied from hours of practice in the Texas heat especially loathed the tennis players, swimmers, and golfers who they encountered on their way to the courts, pool, and the club. Freshmen had to run record races, were tossed into the fountain in front of the Tower, and do antics on the steps of the dining hall while the upperclassmen consumed the food. (There is no genteel way to describe record races. The honoree was stripped, a phonograph record—78 or 33 rpm—was placed between his cheeks, and he was made to run naked down a long corridor with the room doors opened on either side. The hosts stood in the rooms with heavy bathroom towels soaked in water and, judging by the pitter-patter of feet, tried to snap the record out. Whelps on either side of the honoree the next day indicated that the theoretical intent of the game was rarely achieved.) A tradition toward the end of the semester was for the linemen to smash their fists through the plywood walls separating the rooms. During my sophomore year, living with this confederacy of misfits in the midst of apocalyptic chaos, I met Professor B. L. Turner one day in the hallway of the Biology Laboratories Building. He asked my name, where I was from, my major, what courses I was taking, how I was doing, and if I wanted an office. It was an experience similar to those of the born-again Christians described by Reverend Quarrles at Tabernacle Baptist Church. Later, when Billie Turner was on a field trip to Africa, he let me live free for the year in his home. That office, and that home, at that time, had a salvation value equal to Betty Gray's dance lesson and the

Pepsi and Milky Ways on summer weekends in the biology building.

The botany majors at Texas in the 1950s were a small, interactive, and competitive group, and because of the limited curriculum, I took many of the same courses as the graduate students. The experience with curve breakers in Spanish class at Sam Houston prepared me for what was in store. By my senior year I had taken most of the courses the department offered and had to expand into other areas, like geology. I also took a memorable course in expository writing. The instructor of an earlier English course had stressed that when facing a blank sheet of paper, or now the computer screen, the writing process was easier if the point of the essay was clearly in mind—he used as an example, The Effects of Working One's Way through College. It also helped if the topic sentence essentially established an outline for the rest of the paper—if the Greeks were right in concluding that man is composed of Body, Mind, and Spirit, we would do well to examine the effects of working one's way through college on one's physical, mental, and spiritual development. The expository writing course came during one of those off-scholarship summers when I worked at Hirsh's Drug Store on Guadalupe Street, eventually rising to the rank of assistant night manager (the only administrative person in the store at night). The pharmacist frequently offered little white pills he said would keep me fresh and alert all night. That didn't seem quite right, and another misadventure was adverted.

My office by then (junior year, 1954) was a corner in the herbarium on the top floor of the Biology Laboratories Building. The office had two interesting features. One was that the wall facing my desk backed up to the room where cadaver parts were kept. These were stored in a large cement vat of formaldehyde with a heavy cement cover that was raised and lowered by a chain that made an eerie creaking sound during the midnight hours when the pre-meds were getting parts out for dissection. It brought back memories of Valkyrian night rides through the Glenwood Cemetery in Houston. The other feature of the building was its copper roof. There was no air-conditioning, so by midday in the late spring, summer, and fall (most of the year) the top floor was almost uninhabitable. I followed the routine of the director of the herbarium, the Texas naturalist Benjamin Carroll Tharp (Graham, 2010a), by arriving at 4:30 in the morning, working until noon, then going to my room in the home of a colorful and eccentric woman named Emma Long. The room was advertised at $24/month and air-conditioned, which technically it was, at night, when she was there; otherwise the thermostat was kept at 85° to save money. We had a prerental interview in the kitchen, and before starting she asked if I would like a Pepsi. It wasn't one of my favorites but I accepted out of politeness. When we finished she told me to put a dime in a cup on the counter for the drink. It was the first of several surprises from the woman

who drove a very large Cadillac—the state car of Texas at the time—and she was successful, confident, and independent. Emma Long was the first woman elected to the Austin City Council. There is a park in Austin named in her honor, and she said she was a relative of Huey Long (1893–1935), flamboyant governor of Louisiana (1928–1932) and U.S. senator (1932–1935). He was assassinated on 8 September 1935 in the foyer of the Louisiana State Capitol in Baton Rouge. He was a populist governor revered by the people, a vociferous opponent of Standard Oil, and referred to by Franklin D. Roosevelt as one of the two most dangerous men in America (the other according to FDR was General Douglas MacArthur).[7] Huey Long's life was chronicled by Robert Penn Warren in the Pulitzer Prize–winning novel, *All the King's Men*; it was the basis for a Ken Burns's television documentary, and there have been two docudramas about him starring Ed Asner and John Goodman. With that familial heritage, it is not surprising that Emma had a few quirks of her own. The room was advertised as including access to a color TV (rare in those days). It turned out to be a black and white TV with strips of blue, yellow, and green cellophane pasted across the screen. The color was unconvincing unless the picture was supposed to be of a strikingly yellow Asian standing in an intensely green meadow under a vibrant blue sky. One day I said to her, "That's not really a color television set." She said, "Very clever. How about another Pepsi?"

Later I moved to an even less expensive room above Hirsh's Drug Store on Guadalupe Street where I worked. About 5:00 P.M. I would go down to the store until 11:30 P.M., then go up to the room that Mr. Hirsh let for $18 a month—as long as there was a minimum of three people to pay for the cost of utilities and upkeep. It was an eclectic group that lived in the essentially abandoned upper floor of the building—a botany major, a marginally unstable veteran named Byron who fantasized about being a baseball umpire, and a waitress named Bobbie, who we suspected was supplementing her income in diverse ways. We kept quiet because if Hirsh had found out about Bobbie there would have been one less roomer and a proportional increase in rent.

The point is that after getting off work I would have to write something for the next day's expository writing class, which began at 7:00 A.M. because of the heat. One night there just wasn't enough time, and I recalled the topic from the previous English course about "Working One's Way through College." It was a subject I could write about with inspiration, so following the ancient advice of Cato the Elder ("grasp the subject, the words will follow"), and with a slight sense of guilt, I developed it into a full-length essay and turned it in the next morning. Not to my surprise, I got an A—after all, it was based on a professional English writer's original idea—but much to my dismay, the professor announced

he had entered the essay in the University's expository writing contest, where it won first place and a prize of $50. I had images of a plagiarizing squad hauling me off to the Writers' Block, but it turned out fine, and a strong thread about respecting originality was woven into the fabric.

Two other events at Texas influenced my approach to learning and later to advising undergraduate and graduate students at Kent. My freshman roommate was on a baseball scholarship. He was impressively bright and the first semester coasted to As and Bs virtually without studying. It seemed to come so effortlessly. He was reminiscent of what Disraeli said of Gladstone—"He has not a single redeeming defect." Walter Gay, an American in Paris in the 1870s, said of the artist John Singer Sargent, "John worked harder than anyone, which seemed surprising in someone so gifted. Those for whom things come easily usually make less of an effort than others, not more" (McCullough, 2011a: 349). In fact, my roommate's scholastic achievements were without effort, and therein lies the rub. The second semester he studied even less, and his grades dropped to Bs and Cs. In his sophomore year he tried to develop better study habits and concentrate harder, but he couldn't, and it was too late. He went on scholastic probation, then lost the scholarship, and finally flunked out. Witnessing the decline of such a bright and charismatic student was sad, and it made a lasting impression. It vividly demonstrated that intellect and opportunity are not enough to ensure success; there also has to be discipline to give these gifts consequence. It created a personal viewpoint that students with above-average intelligence, but who have to work hard and, thus, develop tenacity, organizational skills, and concentration, are likely to succeed if given the chance. The success of exceptionally gifted ones can not be taken for granted, and they must also be monitored to ensure that other essential traits are in place. Otherwise, for all practical purposes, smart and dumb come to the same end, and a lifelong defensive attitude often sets in that can be limiting as well as an annoying personality trait expressed as excessive, compensating self-promotion.

In a related encounter, a small cadre of peers in the athletic dormitory unrelentingly verbalized about their abilities in sports, academics, and social relationships—sometimes all three. It was fun to hear the tall tales of these Walter Mittys of the Texas dormitory. In a few instances, however, the fantasies were presented with conviction and almost a demand that they be taken seriously. In these cases, the reasons probably ran deep—a real or a perceived lack of ability; limited praise from parents trying to raise their own self-esteem; or insensitive criticism at critical points in their life. Whatever the causes, one frequent result is the compensating rhetoric of the insecure. Sharp edges of behavior are sometimes rounded off with maturity and by subtle counselling, but by college

it is usually too late. The encounters generated a tolerance for the personality quirks of genuine achievers and skepticism about the claims of those who drape the mantle of greatness over their own shoulders. The experiences contributed a strand of distain for laziness, an aversion to braggarts, and a tendency later to base evaluations of students and colleagues more on what was being accomplished than on what was being claimed.

Throughout the early semesters at Texas, I was listening daily to the graduate students talk about their theses and dissertation research. In my sophomore year, Billie Turner told me of a relatively new field called palynology. It was the study of pollen grains and spores, and in addition to their role in medicine in the study of allergies, palynology had other applications that gave it both an academic and a practical importance (see, e.g., Balick & Beitel, 1989; Jarzen & Nelson, 2008; Beeland, 2009). They are incredibly diverse morphologically, so different genera and some species of plants can be identified by their pollen or spores alone, and this makes them useful in taxonomy (classification) and discerning evolutionary patterns and relationships. The wall is almost indestructible under acid conditions, so if they fall into bogs, swamps, or deltas they preserve as fossils. Also, techniques are available for extracting them from rocks. If the pollen content of samples taken up a section (that is, from old to young) goes, for example, from ferns and palms to grasses, then to cacti and mesquite, it reveals the ancient climate, changes in climate, and a vegetation history that had progressed from tropical forest to grassland to desert. If the patterns repeat, that gives a hint of what might be in store for the future. It is also possible to tell when and at what rate changes in vegetation and the environment took place because the sediments can be dated by ^{14}C and other radiometric techniques. If the pollen content is similar in widely separated geologic formations, it suggests these formations are the same age, and this makes palynology useful in the petroleum industry for stratigraphic correlation and paleoenvironmental reconstruction. It seemed interesting, but so did a lot of other fields.

The moment of decision came when Professor Tharp convinced friends at Humble Oil, now Exxon, to set up a graduate assistantship for the study of fossil pollen and spores in some Texas peat deposits. Tharp gave me his 1940s Dodge (97,000 miles) to use as a field vehicle, and later in 1958 when I upgraded to a 1952 Chevy Bel Air he guaranteed the loan at the bank in Austin, of which he was a director. I recall his telling the bank president, "If he doesn't pay, I will." It was a deeply appreciated vote of confidence, and I would have lived on Pepsi and candy bars forever before forfeiting on that loan. I also earned a few extra dollars through Tharp's acquaintance with the Klebergs, who owned the famed King Ranch at Kingsville, Texas. During times of drought, cattle feed would

be supplemented with pads and fruits from the prickly-pear cactus, *Opuntia*. Workers would sit on the back of jeeps with flame throwers and burn off the spines. One year the cacti did not set many fruits, and to determine the reason the seeds had to be gotten out for study. Tharp brought in several large buckets of fruits and said I would be paid $5 an hour to burn the spines off with a Bunsen burner and chew out the seeds. At first I thought about dragging the process out to make more money, but after the first half-bucket, and after failing to subcontract the job at $2 an hour to some undergraduates, I finished the project quickly. The experience has had limited value as a résumé item, but it was a unique way to work one's way through college.

The first field trip to find deposits suitable for a master's degree project (e.g., highly organic sediments accumulated in deep peat bogs) was an exploratory visit with Dr. Tharp through the pine woods of East Texas. On the way we stopped in a small country store and asked directions to Anahuak (pronounced Ana-wak). The old woman minding the store told him, "it's An-u-wak." How can it be An-u-wak, Tharp asked, there's no u in the middle of the word. Drawing herself up to her full 4 foot 9 inch height, she said, "Young man [Tharp was in his seventies], I've lived here for 97 years. And it's An-u-wak."

Lest the impression be given that picturesque people and expressions are confined to rural Texas, I will cite some examples from other regions. One of the most fascinating environments of eastern North America is the quiet, serene, almost mysterious cypress swamp of Louisiana, with its festooning Spanish moss, silently gliding alligators, and cottonmouth water moccasins. This unique environment has made it a frequent locale for films such as *Southern Comfort* (1981), which recounts the fictitious, abusive, and ill-advised confrontation of nine National Guardsmen with the local inhabitants. My Cajun relatives are both amused and appalled at how those living in isolated parts of the swamp are often depicted—particularly with regards to their distinctive music (zydeco), culture (admittedly somewhat taciturn with strangers but joyously effusive among friends), humor (a bit earthy), language (a colorful blend of French and Spanish), transportation (in flat-bottomed boats called "pirogues"), and religion (Catholic but with broad options, including the still-practiced voodoo magic). Nonetheless, the beauty of the cypress swamp of the southeastern United States is frequently captured in these films with dramatic effectiveness.

In this part of the country there are large, multiacre, slightly raised domes of land locally called islands in the sense that they are circular stands of oak surrounded by more moist vegetation, lakes, or swamp. One of these is Jefferson Island, site of the Live Oak Botanic Gardens at Lake Peigneur near New Iberia, Louisiana. New Iberia is home to a great concentration of Cajun relatives named

Viator and to the McIlhenny Tabasco Company on Avery Island. The region's botanical claim to fame is the Evangeline oak immortalized in Longfellow's epic poem, "Evangeline." It is the fictitious account of a mythical Cajun couple separated on their wedding day. Over the years, truth has become stranger than fiction, especially around the epicenter of the Evangeline impact at St. Martinville. The oak where they supposedly spent time together is actually the last of several planted this century, and there is even a statue at the St. Martin de Tours Church marking her alleged burial place. Later twists in the story include a donation from actress Dolores Del Rio, who played Evangeline in a 1929 film, to build the statue provided it was in her (Del Rio's) image and a petition from some French Canadians demanding return of the nonexistent remains to fictitious Evangeline's home in Arcadia, where she never lived.

A saga of equal drama but based on a real event occurred in the vicinity on 21 November 1980. Texaco was drilling a well at Jefferson Island, unaware that below were caverns of the Diamond Crystal Salt Mine. At about 1,228 feet depth, the rig began to tilt, and a whirlpool formed in the lake, eventually creating a crater 180 feet in diameter. Pulled into the crater were two Texaco oil rigs, several barges from the adjacent Delcambre Canal, a loading dock, the Live Oak Botanic Gardens, assorted greenhouses, a house trailer, trucks, and several tractors. Miraculously, no one was killed, and the water drained so fast that the boat of Leonce Viator, Jr., who was fishing on the lake, quickly settled in place, and he was able to run to shore.

Other settings that provide a slight overlay of mystery are the whitewater streams flowing rapidly through the densely vegetated but sparsely populated mountain valleys of Appalachia. There are wild turkey, black bears, and timber rattlers, and the people living for generations in the isolated valleys, or hollows, such as Loretta Lynn's Butcher Holler in Kentucky, like the Cajuns of the Louisiana swamps, often view strangers with unsettlingly quiet observation. The Chattooga River in South Carolina and Georgia is one such place as experienced by the fictitious characters Lewis Medlock, Drew Ballinger, Ed Gentry, and Bobby Trippe. One can still hear the haunting call-and-response music of "Dueling Banjos" as they sought *Deliverance* from the Chattooga Valley, where the 1972 film was made.

Reed C. Rollins, former director of the Gray Herbarium at Harvard University, recalled going into a corner store in the deciduous forest of rural Maine to ask directions. As he entered the store, conversation stopped and all eyes followed him to the counter. "Can you tell me how to get to Presque Isle?" he said. Not a word. After what seemed like an interminable passage of time, the man behind the counter motioned him to lean forward, stared at him intensely, and whispered, "Don't you move a god-damn inch." Rollins, thinking his days on

Earth were near an end, was relieved to learn this was the man's way of telling him, "You're in Presque Isle."

Choosing botany and geology as fields of study carries with it the need to comprehend the formidable nomenclature used for naming organisms. It is futile to seek consistency in how scientific names are selected, other than that they are in Latin, italicized in print, and followed by the name or abbreviation of the person first describing the species (e.g., *Pinus strobus* L., for Linnaeus; white pine). Generic names range from *Aa* (an orchid) and *Io* (a composite; from Zeus's love in Greek mythology; James Solomon and John Pruski, personal communication, 2009), to *Archaeosphaerodiniopsis* (a dinoflagellate) and *Pseudochaetosphaeronema* (a fungus). The binomial system (genus + species) used for naming plants and animals was developed by Linnaeus (1707–1778), who was a Swedish botanist and physician to the royal family (Blunt, 2001). He was also the first to apply the old alchemy symbols for mercury (☿) and iron (♂), used by astrologers for Venus and Mars (the sword and shield of the god of war), to designate femaleness and maleness, and he developed a thermometer based on units of 10. In the Linnaean thermometer, 0 indicated the boiling point of water and 100 the freezing point. It was left to Anders Celsius (Swedish astronomer, 1701–1744) to rearrange the scale into the intuitively logical sequence used today.

In the 18th century, Linnaeus was one of the most famous scientists in the Western world, and his activities were centered around the enlightened court at Uppsala. He attracted numerous students, whose 176 theses constitute a series known as the *Amoenitates Academicae*. The students were sent on perilous journeys to exotic places to collect plants, animals, minerals, and curiosities for natural history cabinets, which were the forerunners of the great European museums (e.g., see Seba, [1734–1765] 2001; and Weschler, 1995). A contemporary of Linnaeus was the eloquent Frenchman, Comte Georges Louis Leclerc de Buffon (1707–1788). Madame Necker, wife of the French minister of finance, said of him, "M. de Buffon has never spoken to me of the marvels of the earth without inspiring in me the thought that he himself was one of them" (Boorstin, 1983: 448). It is not surprising that when Buffon began naming organisms on his own, Linnaeus was irked and sought a way to ennoble him in the literature of science. He waited until a particularly repulsive animal came to his attention, then attached Buffon's name to it forevermore; hence, the species name of the common European toad, *Bufo bufo* L. Linnaeus's system for naming plants was based on the number and morphology of stamens (the male or pollen-bearing reproductive parts, where two sperm nuclei are contained in the pollen grains of angiosperm or flowering plants) and on the pistils (the female or ovule-bearing reproductive parts; an egg is borne in the ovules of the pistil, which

become seeds after fertilization). Linnaeus's classification was deemed by some as unnatural, repugnant, and immoral. For example, his work was not allowed in the Vatican until 1775. One particularly vocal critic was Johann Georg Siegesbeck (1686–1755) who, apparently speaking for God, ventured that God would never allow such unchastity to be associated with his creations (Kuhn & Kessler, 2007; Wulf, 2009). Linnaeus responded by naming a less-than-resplendent foul-smelling weed *Sigesbeckia* L. Another innovative use of plant names was made by Jack Sharp, botanist at the University of Tennessee, while collecting plants in a remote area of Guatemala. In the 1940s many of these regions were inaccessible by conventional transportation, so an alternative means was to go in with the Wycliffe Bible Translators. They would make their way into isolated villages and clear a runway where about once a month planes would land bringing in supplies. Field scientists could fly in on these fights and be picked up on the next plane out. When Sharp arrived, and the plane had departed, the women of the village came out with small children wanting him to do something. Not speaking the language he could not comply, and they became incensed, refusing him the necessities of food, water, guides, and directions. Eventually it occurred to him that because he came in on the plane and was wearing khaki field clothes they had mistaken him for a priest and were bringing children out to be blessed, which he was refusing to do. It was a tense situation, and although he did not know much Latin, he felt he knew more than they knew. He gathered them together in the square, climbed upon his plant press, stretched his hand out over the crowd, and recited the scientific names of several plants—*Pinus alba*, *Pinus oocarpa*, *Geranium maculatum*. They went away happy, probably no better or worse off for the experience, except as adults possibly bending toward the light.

In my junior year (1955) I set up a primitive palynology laboratory in the herbarium, and with funds from Exxon, the athletic scholarship, and working at Hirsh's Drug Store, I ended my first four years at Texas (1952–1956). I completed a master's degree in 1958 and published it in the journal *Ecology* with my thesis advisor as "Pollen Studies of Some Texas Peat Deposits" (Graham & Heimsch, 1960). By the end of the master's program at Texas the personal and professional die had been mostly cast. Nonetheless, some early threads remained to be reinforced, and new ones added, to what was becoming an increasingly intricate tapestry.

University of Michigan, Burton Tower

Michigan

When mentors at the University of Texas were recommending places for doctoral studies, the consensus was that the University of Michigan with Chester Arnold would be a good choice—and so it was. Michigan had one of the most highly regarded botany departments in the world, and Arnold was a renowned paleobotanist. He was a large and ponderous man with a lugubrious air—Richard Scott (1995) called him "substantial" in both stature and reputation. When I arrived in Ann Arbor, two recent experiences were clearly on his mind. He was working on a revision of his textbook, *An Introduction to Paleobotany* (Arnold, 1947) and was anxious to avoid a repeat of a problem with the earlier edition. It had been copyedited just after World War II when competent copyeditors were scarce. They decided he was being inconsistent in his use of "m" and "mm," so

they changed them all to "m," giving rise to minute structures 50 m in diameter. In the next editing they were all changed to "mm," so there were giant *Sequoia* trees 50 mm tall. It was not until the published copies were received that the measurements were mercifully found to be correct.

The other incident was an encounter with a collector of fossil plants who had brought in two sliced sections of the rather common Cretaceous fern *Tempskya*. In exchange for the sections, he wanted the museum to buy him a field vehicle. Arnold said he was not interested, but the man persisted, threatening to sell them to someone else if his demands were not met. The exchange had been going on for nearly an hour when Arnold finally said, "I think once they were quite valuable, but now that you have sliced them, they are just a little too thin for bookends and a little too thick for toilet paper."

After these two experiences, Arnold was in a singularly bad mood and was looking forward to a three-week field trip to my dissertation locality at Succor Creek, Oregon. I was a bit apprehensive, but along the way I learned that in addition to a quiet sense of humor, he was supportive, generous with his time, and conservative beyond belief with museum funds. The first two nights we slept on park benches, and on the third night we checked into the $6-a-night Ferguson Family Motel. It was there I learned that Professor Arnold suffered from excruciating back pain that required him to sit for an hour or more in a harnesslike contraption slung over the bathroom door to relieve pressure on the vertebrae. Afterward, we would go to the nearby Dairy Queen and have a 15-cent cone. One night I decided to have a 25-cent sundae, and for the rest of the evening and the next day Arnold clearly had something on his mind. Just before our next nightly visit to the DQ he said that because the museum was paying, it might be best to limit ourselves to the midsize cone. I was not sure if he was serious, but counting on his quiet sense of humor, I asked if I ordered a 10-cent cone for two nights, if it would be alright to order a 25-cent sundae every third night. He thought it over and said that would be awkward because it still would make a 25-cent expenditure for an item listed on the pretrip budget as 15 cents. So for the rest of the trip, 15 cents it was. Years later at a dinner at their home to commemorate completion of my dissertation (Graham, 1965), Mrs. Arnold served desserts, and they were hot fudge sundaes. Upon leaving I handed Professor Arnold a dime and he didn't blink an eye. After all these years, I still remember the park benches, the 15-cent cones, and Dr. Chester A. Arnold hanging from the bathroom door of the Ferguson Family Motel.

Another colorful character at Michigan was Elzada Urseba Clover (1897–1980). She was one of the first two women, along with graduate student Lois Jotter, to go down the Colorado River in a raft (1938). As might be suspected, she

was a singularly independent and formidable woman who made her way through the academic profession when it was immeasurably more difficult than now. She had a John Wayne–like stride and, when necessary, a take-no-prisoners attitude. I taught a section of her course in horticulture at the Michigan Matthaei Botanical Gardens and became a great admirer. Her nemesis was the director of the garden, the always distinguished Geoffrey Norman. He used to chide her about hanging the students' heavy baskets of plants and soil from the metal girders in the greenhouse. In return, when he purchased a soil sterilizer for the garden that did not get hot enough to work, she named it "Norman's Worm Warmer."

Others at Michigan were mostly gray-flannelled and conservative. In an exhilarating, mostly relaxed, and pleasant atmosphere, they represented in style and manner the professionalism of the day, giving a "you're here for a purpose" air to the intellectual climate. Professor Warren H. Wagner, Jr.'s contribution to this atmosphere was to periodically ask the graduate students, "Tell me something you know today that you didn't know yesterday." Most felt they really needed to have an answer. It definitely was not a laissez-faire process. Some new students did not pass the department's preliminary examinations during the first semester, and if unsuccessful on the second try, they disappeared from the scene. Their absence was a reminder that however enjoyable and stimulating the endeavor, it was essential to remain focused on courses, grades, and dissertation research.

The several German classes at Texas were particularly helpful at Michigan. The classes in Austin were held in Batts Hall, and each day the instructor would ask a question that had to be answered in German. Once he asked, "Wo sind Sie?" (Where are you)? I knew almost no German, but I did know a few opera titles, so contrived a response, "Ich bin in die Fledermausen Hausen." (I am in Bat[t]s Hall.) It was a linguistic aberrancy, but it served the purpose. At Michigan, a reading proficiency in two languages, usually French and German, was required for the doctorate degree. Today, one or both are often satisfied by fluency with computer languages. Most students were strong in their chosen field but less so in languages, and many put off taking the proficiency test as long as possible. Being fresh from the trenches, I completed the requirement in German during the first year and soon afterward the one in French. Through an accident of course selection at Texas, I managed to create a good first impression at Michigan.

Another person I encountered early on at Michigan was Kenneth Jones, chairman of the Botany Department. He reinforced a thread first contributed by Daniel Penick, namely that it was all right to be "educated" and ultimately important to develop interests in the arts and humanities outside the narrow fields of science (Krauss, 2009). Everyone works as a specialist, but everyone also lives in a much wider and complex global arena. Although Jones was head of the

Botany Department, he taught the Great Books course in the English Department. Both he and Penick were latter-day versions of Renaissance men, and those role models seemed like something worth emulating.

Kenneth Jones was also receptive to, and even encouraged, suggestions from administratively naive graduate students about departmental policies and university governance. Every fall semester, books, fees, the difference between in-state and out-of-state tuition, cost of room and board if living in the graduate dormitory, and other expenses were due in September, while the first check from teaching fellowships came in October. Being versed in the management of nonexistent funds, I suggested that the appropriate costs be deducted from the fellowship, the remainder divided among the nine-month academic year, and the first check be given at registration in September when costs were the greatest. This later became the procedure at Michigan. During a year when undergraduate enrollment was especially high, I also asked to teach double the student load for twice the fellowship. Never once was the phrase uttered, "It's not tradition," and it worked out well. With a little more financial flexibility, I continued collecting books in botany and even bought tickets to the Choral Union and Extra Concert Music Series. Today, bringing huge orchestras and renowned soloists from around the world for 15 concerts every school year to a small university auditorium is the mark of a bygone era. Then, in weekly succession, there were performances by the likes of Renata Tebaldi, Yehudi Menuhin, Glenn Gould, and the Berlin Philharmonic. After one concert, the musicians of the Boston Symphony Orchestra came to the graduate dormitory for dinner, and one member sat at each table. At ours was the renowned flautist William Kincaid. It was becoming clear, as Miss Weaver had suggested at Dow Elementary, that things of excellence, enduring quality, and challenging complexity are special, worth pursuing, and worth preserving.

The high mark of five years at Michigan was meeting Shirley Tousch, who was working on a master's degree in botany. She was a Fulbright Scholar to Denmark, and the only reason she was not a member of Phi Beta Kappa was because the chapter was established at Michigan State the year after she left. We were married in 1960 in the Dutch Christian Reformed Church in Ann Arbor, and we went to that church for the rest of our time at Michigan. Reverend Leonard Verduin had been a Fulbright Scholar to the Netherlands, and he talked about the importance of the Bible as historical literature, the discoveries of ancient, multiple texts in the Middle East, and the value of religion as a code of ethics when unfettered from the shackles of literal interpretation. Thinking about disciplines based on myths, faith, spiritualism, and unquestioning obedience versus those relying on reproducible data generated through observation and experimentation was valuable later when dealing in the classroom with issues like

evolution and intelligent design. One is science, the other is mythology, and both can be damaged when the two are advocated as coequal in a science curriculum. They differ in that myths are not correctable through repeated reproducible observation, experimentation, and unbiased reason.

Over the years, the house we rented at 524 Elm Street accommodated an interesting group of people. A genteel English couple moved in upstairs, and once they invited us up for tea. He was a geophysicist and clearly erudite but never said much about why he was in Ann Arbor. He certainly was known around the world, however, because he had previously worked out the formulas describing the formation and destruction of ozone in the upper atmosphere through the action of sunlight on oxygen (Beerling, 2007: 66). In 1961, Sidney Chapman was chairman of the International Geophysical Year.

In the summer of 1961 we sublet the apartment to two students while we were on a field trip to Mexico. One condition for our receiving a slightly reduced rent from the owners was that we were to take care of the property. When we returned from Mexico we found remains of juniper twigs in the oven, scar marks on the kitchen floor, and dents on the refrigerator door. The occupants said the twigs were burned to create an aroma conducive to meditation, but it was probably to cover the odor of the monkey. During the day he was locked in the kitchen and wiled away the hours by running the kitchen chair across the floor and ramming it into the refrigerator door.

The first step in my dissertation research was to sort about 10,000 plant fossils into types for identification. This was done in a huge barn at the Matthaei Botanical Gardens, and in the early fall it was a delightful place to work. By the late fall it was becoming less so, and I asked if some heat was available. Dr. Arnold found a small oil-burning stove that warmed the air a foot or so around the contraption. Each day when I returned from spending a Michigan winter day in an essentially unheated barn, Arnold would ask, "How's the research going?"

Each year the Museum of Paleontology gave an award for the best dissertation in paleontology. I received the award in 1961—an honor muted only by fact that as I recall it may have been the only dissertation in paleontology in 1961. We used the $250 stipend to buy a schnauzer we named Otto. This created a problem when we moved to Harvard because one of the botany professors there was Otto Solbrig and care had to be taken when talking about fleas, trimming, and having him fixed.

In 1963 Elso Barghoorn called Professor Arnold to ask if any students there were interested in a postdoctoral fellowship at Harvard. Barghoorn had a project on some Quaternary deposits in Panama that contained fossil spores and pollen. The core had penetrated some underlying Miocene sediments, and he was

looking for someone to work on that material. I had just completed a dissertation on the Miocene Succor Creek and Trout Creek floras of southeastern Oregon. The Arnold Arboretum also offered Shirley a postdoctoral fellowship as part of the Flora of the Southeastern United States Project. So, in the fall of 1963 we drove to Cambridge, Massachusetts, where we found many varied and unexpected threads for the fabric of our lives before entering the supposedly tranquil and uneventful ivory tower of academia at Kent State University.

Harvard

Sir,

I beg to inform you that at a meeting of the President and Fellows of Harvard College held June 3, 1963 you were appointed Research Fellow in Biology.

Your obedient servant,
Denice W. Beneey, Secretary

Harvard University, established in 1636, is the oldest university in North America, and as the above announcement conveys, it still bears the noble stamp of tradition. It seemed inconceivable there would be questions about the quality of any faculty, staff, or projects at this venerable institution, but in the 1960s there was one notable exception. Each day as we walked down Divinity Avenue toward the herbarium, we passed a building on the left where the research was considered suspect and the motives of the researchers dubious. In 1938, Albert Hofmann had prepared the first lysergic acid diethylamide (LSD) at the Sandoz pharmaceutical laboratories in Basel, Switzerland.[8] The experiments were part of an effort to develop an analeptic—a restorative or stimulating medication for the central nervous system. The compound is related to ergometrine, an alkaloid found

in the fungus *Claviceps purpurea*, which causes ergot of rye. This plant disease was around as early as 857 A.D., and when infected seeds are incorporated into rye flour, in its strongest manifestations it induces hallucinations, madness, and death (St. Anthony's fire), all of which were symptoms common in rural villages in Europe beginning in about 1853. The most recent episodes of ergot poisoning were in 1951 at Pont-Saint-Esprit, France, and in a plot from *The X-Files* in which a tattoo artist made dyes from grass infected with ergot. During the laboratory synthesis of LSD, Hofmann accidentally ingested some of the compound and recorded the following effects:

> Last Friday, April 16, 1943, I was forced to stop my work in the laboratory in the middle of the afternoon and to go home, as I was seized by a peculiar restlessness associated with a sensation of mild dizziness. On arriving home, I lay down and sank into a kind of drunkenness . . . characterized by extreme activity of imagination . . . an uninterrupted stream of fantastic images of extraordinary plasticity and vividness and accompanied by an intense, kaleidoscope-like play of colors. This condition gradually passed off after about two hours. (Hofmann, 1970: 93)

Three days later (19 April 1943) he ingested 5 cc of an aqueous solution of 0.25 mg LSD at 4:20 P.M. and at 5:00 P.M. recorded that

> at this point the laboratory notes are discontinued: The last words are written only with great difficulty. By the time the doctor arrived the peak of the crisis had already passed. . . . The following were the most outstanding symptoms: vertigo, visual disturbances; the faces of those around me appeared as grotesque, colored masks; marked motoric unrest, alternating with paralysis; an intermittent heavy feeling in the head, limbs and the entire body, as if they were filled with lead; dry, constricted sensation in the throat; feeling of choking; clear recognition of my condition, in which I sometimes observed, in the manner of an independent, neutral observer, that I shouted half insanely or babbled incoherent words. Occasionally I felt as if I were out of my body. Six hours after ingestion . . . only the visual disturbances were still pronounced. Everything seemed to sway and the proportions were distorted like the reflections in the surface of moving water. Moreover, all objects appeared in unpleasant, constantly changing colors . . . an unending series of colorful, very realistic and fantastic images surged in upon me. A remarkable feature was the manner in which all acoustic perceptions (e.g., the noise of a passing car) were transformed into optical effects, every sound evoking a corresponding

> colored hallucination constantly changing in shape and color like pictures in a kaleidoscope." (Hofmann, 1970: 94)

These sensations are reminiscent of those experienced by poet and chemist Humphry Davy (1778–1829) and his friends of the British Romanticism period (Samuel Taylor Coleridge, Henry Wadsworth Longfellow, Poet Laureate Robert Southey) upon prolonged inhalation of concentrated nitrous oxide (Holmes, 2008: chapter 6).

Timothy Leary was a lecturer in psychology at Harvard between 1959 and 1963, and while there he administered LSD and other drugs such as psilocybin to undergraduates and graduate students. He was dismissed from the university under the charge of failing to meet classes, but his high-profile challenge of drug laws and advocacy of psychedelic substances were also factors in his dismissal, as was violating instructions not to give the drugs to undergraduates. He clearly had a difficult and troubled past, with discipline problems at Holy Cross, the University of Alabama, and West Point, before being let go from Harvard. He was married five times, and his first wife, Marianne, committed suicide. His contention that he learned more about psychology in five hours with psilocybin than in 15 years of study is such a blustering exaggeration that it should have appealed, and perhaps it did, only to the very gullible, and advocating that the youth of the world should "turn on, tune in, and drop out" must rank among the most irresponsible statements ever made by a figure with a public following. Considering the aftermath of recreational drug use since the 1960s, including the human consequences of the production, distribution, sale, consumption, treatment, crime, gang wars, corruption, loss of life, wasted talent, parental anguish, and lives destroyed, the statement by David Crosby (of Crosby, Stills, and Nash) from a *Time* interview that "we were right about everything except the drugs. We were right about civil rights; we were right about human rights; we were right about peace being better than war. Most of the causes we espoused then were correct" seems a bit cavalier (quoted in Atkins, 2007). For the leaders of the movement it was a source of money, fame, and the admiration of adolescents. Even a superficial appreciation for the complexity of the human mind would reveal that repeated ingestion of substances causing vertigo, visual disturbances, loss of motor control followed by paralysis, shouting insanely, babbling incoherent words, and seeing grotesque images was surely dangerous. Deep philosophies of life that have confounded thinkers of genius throughout time are not likely to be revealed to those whose mental functions are impaired through chemistry. The fact that babble is incomprehensible doesn't make it profound. I listened to Leary trying to give a lecture on a street corner in Austin,

and it was a sad occasion. The problem with artificially induced attempts at mind expansion is that eventually the mind no longer contracts to a functioning state, there is physical damage, and the thinker is unaware or unconcerned about the deterioration but is still willing to advocate that the young try this path to so-called enlightenment. Such was the case with Leary in Austin in 1980 as he meandered through the flashbacks of time. Once the dangers of psychedelic drugs were recognized within the "culture," their use declined or shifted, and Leary passed from the scene. It was an unfortunate period in our history, and we are still paying the price. In the 40 years since President Nixon declared the War on Drugs, it has cost the United States billions and still costs billions every year that could go to other causes. It would seem evident that if simultaneously sex becomes casual, drugs become recreational, and values become optional, a point must be reached where many persons even with deep intellectual and financial resources, patience, and altruism will be forced to conclude it is impossible to keep up with an ever-growing segment of society bent on self-destruction. Perhaps they will be just overwhelmed by the numbers and contribute, in part, because of the financial benefits and social expectations or resign themselves to watch from the sidelines as the consequences of a drug culture and other self-induced abuses in all their manifestations proceed to a predictable end.

Moving toward but not quite to the center of the professorial ranks at Harvard was Elso Barghoorn, who was an intriguing as well as a challenging person to work with on a daily basis. An engaging flakiness that attracts from afar is often less endearing close up, but to be fair he was interesting to be with and generous with his time and support. He was also unpredictable, and it was difficult to gauge his mood from day to day. He would often come to the laboratory between three and four in the afternoon, with blurry eyes and slurred speech, and visibly shaking from hypertension that he only sporadically treated. There was never a dull moment with Barghoorn, and he seemed mostly to enjoy visiting exotic places and being in the field. Elso and his secretary Dorothy Osgood, my wife Shirley, and I were in Panama during the Christmas season of 1963–1964 at the time of some serious riots orchestrated to coincide with negotiations for a new lease agreement for the Panama Canal. We were in the western town of David, and left separately to return to Panama City when the riots were at their height. Shirley left Panama just before flights were canceled and I got the last flight out the next night. Elso and Dorothy came in the following day, unaware of the riots, and had to take refuge from the gunfire behind the huge mahogany bar in the Tivoli Hotel. The following day they were driven to the Canal and loaded onto a banana boat heading for New York. The only good thing to come out of the venture was that after the long 10-day voyage, when they arrived in New

York, they were engaged. At the same time Elso's brother, Frederick, professor of Soviet studies at Yale, was under house arrest in Moscow for writing some unflattering articles about the Soviet economy. Thus, the situation facing Mother Barghoorn, who was calling the laboratory daily, was that one son was presumed lost at sea while the other was under arrest in Russia. Through the intervention of President Kennedy, Frederick was released, and Elso and Dorothy eventually showed up in Cambridge and were later married.

During all of this, and through later experiences at Kent, I kept recalling courses I took at Texas in philosophy (epistemology) and in the philosophy of science. The instructor in the latter course expounded the view that the difference between creative people, like artists, musicians, and philosophers, versus research people, like scientists, is that artists need turmoil in their lives to stimulate the creative process, while scientists need constancy and uneventfulness for whatever it was they did. Inconsistencies in that theory, including the distinction between research and creativity, began to emerge early. Upon arriving at Harvard I went into the Farlow Herbarium to look at some specimens when the director was (Mr.) Dr. I. McKenzie Lamb. When I returned the specimens at the end of the year, the director was (Ms.) Dr. I. McKenzie Lamb, a rare transformation in the 1960s. The original Mrs. Lamb (McKenzie's wife) was anything but silent and was a notable individualist in her own right. She had earlier brought a lawsuit against Harvard, claiming that the poison used in the herbarium to fumigate plants was making her sick—every Monday morning the fumigant was set off and every Monday Mrs. Lamb claimed she became ill. One morning the bomb was put in the fumigating room, but not set off, Mrs. Lamb said she got sick, and the case was dismissed. Between Timothy Leary, the Barghoorn brothers, and the Lambs, constancy and uneventfulness did not seem to quite capture professorial life in the ivory tower.

Life as a graduate student could also be challenging. G. Ledyard Stebbins (1906–2000; Harvard, 1924–1931; Smocovitis, 1997) was a brilliant plant geneticist whose dissertation was on the chromosome morphology of the genus *Antennaria*. In the dissertation, he initially misinterpreted the orientation of the chromosomes, and when a professor on the committee, Karl Sax, pointed this out, Stebbins made the change. At Sax's request he also deleted some disparaging remarks about another cytologist, Cyril Darlington. The chairman of the committee, E. C. Jeffrey, who was the source of the material about Darlington, was irate, and a stalemate ensued: Sax felt the deletion had to be made; Jeffrey would not sign the dissertation if it was made, and Stebbins was caught in the middle. The compromise was a dissertation with Sax's views still technically included but pasted together and glued over with Jeffrey's amendments.

Ledyard Stebbins's experience at Harvard in the 1930s demonstrated the need for a tough strand of academic resiliency that is equally necessary today. On the way to Michigan I stopped in Bloomington, Indiana, for the American Institute of Biological Sciences (AIBS) meetings. These were important gatherings for graduate students because it is where they often presented their research for the first time to a national audience. Papers at AIBS based on masters' theses were unusual in the 1950s, and after presentation of the Texas pollen studies I waited to hear reaction from the audience. Dan Livingstone of Duke University weighed in with a devastating critique about virtually every aspect of the paper. Paul Martin of the University of Arizona leaped in with a defense and an equally vigorous critique of Livingston's comments. After the session Livingstone said "nice paper."

Strong criticism of papers in public can suggest factors at work other than concerns about research, as evident later at a presentation I gave at the Missouri Botanical Garden in 1969. Invitations to participate at national and international symposia are important to new faculty just starting their careers. The meeting in St. Louis was moderated by Marston Bates, a prominent professor of zoology at Michigan, and a number of other notables were present. After my paper, a charismatic and noted botanist, Hugh Iltis, gave a highly theatrical critique, concluding that "this is all garbage." The remarks were so over the top that if they were meant to garner attention, they certainly got mine. Bates's comments at the end were, "Yes, well . . . ."

Jane Gray was a bright, energetic, pencil-thin six-footer who joined the University of Texas geology faculty in 1956. It soon became apparent that it was going to be a challenge to successfully integrate her into the department. She gave about half the students in the large paleontology course Ds and Fs, and the students took up the first and only petition against a faculty member in geology at Texas. Later she threatened legal action against a colleague at another university if he studied plants from a segment of the geologic column she claimed as her own. Her presence at Texas was so disruptive that when she married a faculty member in zoology the issue of nepotism was raised, and she was dismissed from the university. She moved to the University of Arizona and eventually to Oregon State University. Along the way she threatened to block publication of my master's thesis but never followed through; she tried unsuccessfully to prevent publication of another study (Graham, 1963; her comments were called "the most asinine I have ever read" by one reviewer); she tried unsuccessfully to prevent my speaking at the International Botanical Congress in Edinburgh in 1964; and she wrote to the National Science Foundation that "this grant is a sorry excuse for a proposal" (it was unanimously recommended by the panel

and funded by NSF). All this must have been frustrating for Jane, and these and a number of similar encounters with other colleagues contributed to her reputation as a difficult individual.

Another person with an interesting complex of motivations was Richard Eyde, a prominent plant anatomist at the National Museum of Natural History of the Smithsonian Institution. I use to make frequent trips to Washington and came to know Richard rather well—we exchanged recordings of "real" country artists like Patsy Montana and Kitty Wells. I was always intrigued by one his favorite phrases, "We are going to do a number on him," by which he meant orchestrating with colleagues of a like mind scenarios that would produce maximum public embarrassment. Over the years, I observed other instances of unnecessarily pointed public skits where the same information could have been conveyed to the author or speaker privately, or a correction published, or, if not, an "opinion" piece sent to a journal. But in such instances correction is probably not the point, at least not the whole point, so it is best to give the actors their moments on stage and move on.

What can be learned from such encounters early in a career? It is that maturity, civility, and self-esteem are not conferred with the degree. Factors that go into making the person are established early, with the professionalization process reinforced partly by events, experiences, and the examples of mentors witnessed in college. Academics who engage in excessive theatrical criticism are comparatively few, so the approach is, at least in part, a choice and depends on the weight of the excess psychobaggage being carried—recognized or unrecognized, but never corrected. Whatever the motivation, flawed strands are part of every fabric. The message from such experiences is that the professional hide must be semipermeable, letting in the good and filtering out the junk.

A feature of the schools in Cambridge in the early days was that men went to Harvard College and women went to Radcliffe College. The two were integrated in 1999, and the latter became the Radcliffe Institute for Advanced Study. Merritt Lyndon Fernald (1873–1950) was professor of botany (1902–1949), and he would give his course to the men at Harvard, then go to Radcliffe and give the same course to the women. One year only one woman signed up, so there was a dilemma about repeating the course for just one person. The compromise was that the female student could come into the Harvard campus building but had to sit in the hallway so she could hear the lecture and see the blackboard but not enter the classroom. Women had a separate reading room in the Widener Library until the 1940s, and they were not allowed in the undergraduate humanities Lamont Library until 1987. In 1962 I attended graduation ceremonies at Harvard with all its pageantry, including the sheriff of Middlesex County riding into the Harvard

FIGURE 11. Harvard sheriff of Middlesex County (forefront) riding into the Harvard Yard as part of the graduation ceremonies in 2006, Cambridge. Photograph reproduced by permission from Harvard University. Photograph by Jon Chase / Harvard Staff Photographer.

Yard on a white steed proclaiming, "Let the ceremonies begin" (Fig. 11). Shirley could not go, nor could women be in the New England Botanical Club. All that has changed, but if these were the practices at enlightened centers of learning in the 1960s, it can be imagined what they were like in the hinterlands.

One of the distinguished professors at Harvard was Reed C. Rollins, director of the Gray Herbarium, and he contributed an important strand to the developing equal opportunity sector of the tapestry. When plans were being made for our Panama trip, Shirley wanted to go to collect Lythraceae and other plants. Although the primary purpose of the trip was to collect fossil material, Rollins provided both encouragement and funds for Shirley because, "It is useful for your research now, and it will help make you a good teacher in the future."

Reed Rollins was the Asa Gray Professor of Botany at Harvard, and the setting seemed right for pursuing an interest I had developed at Michigan. Plants and animals are not uniformly distributed over the surface of the Earth, and the same or similar species may occur in widely separated populations in different parts of the world. One example is the plants found in the deciduous forest of eastern North America, and again in the central People's Republic of China. The study of such disjunct distributions is part of the field of biogeography, and this particular

pattern was noted by Asa Gray in the 1840s. However, the first person to point out that some plants in parts of eastern Asia are similar to ones in eastern North America was Linnaeus. A fundamental difference between the dissertations of Linnaeus's time and those of the present was that the professor usually wrote the thesis. The student's role was to become familiar with the subject, defend it in Latin, and argue it in public debate. The goals were to demonstrate a fluency in Latin and a familiarity with the rules of formal disputation. In 1750, Linnaeus wrote a thesis for Jonas P. Halenius called *Plantae Rariores Camschatcenses*, in which the floristic similarity between eastern Asia and North America was first mentioned. Being at Harvard on a Gray Herbarium appointment, I decided to translate the dissertation (Graham, 1966). Having had only limited experience with Latin at Texas, the result had a distinctly pharmaceutical twang to it. I gave it to a theology student for improvement in the language and to a Latin scholar and botanical historian at the British Museum, William Stearn, for improvement in the content. One expectation of postdoctoral work in the 1960s was to broaden specialized interests by pursuing topics in related fields. Another goal was to define an area of research that could become one's own after postdoctoral work was completed. It is a fact of academic life that tenure, promotion, and salary are based in part on securing research grants and attracting graduate students. From the university's point of view, even the latter is a financial matter because money received from the state is based on enrollment, and, not to put too fine a point on it, doctoral students are worth more than undergraduates. Thus, the task is to develop productive areas of expertise independent of those already preempted by the home institution. The translation of Halenius's thesis served to broaden my research horizon, and the Panama studies, suggested and facilitated by Elso Barghoorn, defined my future research in vegetation and environmental history of the American tropics.

After finishing one or more years of postdoctoral work, it is usually decision-making time. Options often include remaining at the same school supported by soft (i.e., temporary) grant money. For the academic year 1964–1965, George Wald (Nobel Laureate for research in vision, 1967) was going on sabbatical. Unusual for someone of his research stature, Wald gave the lectures in freshman biology, and I was asked if I wanted to teach the course while he was gone. In such situations it is easy to fantasize that the temporary position might be a trial run leading to something permanent. Shirley was also invited to continue her work with the Arnold Arboretum. The offers were tempting because it was an opportunity for both of us to remain at one of the great universities of the world. The downside is that people in these positions are not really faculty, and they can be let go any time as funds are redeployed. When women's civil rights activists

began raising concerns about the fairness of long-term, part-time employment, designated as temporary regardless of the number of years served (sometimes into the decades), without retirement or other benefits, and with no job security, pressure began mounting to address the problem. It was always primarily a gender issue because a disproportionate number of those holding temporary or part-time positions at universities were single women or wives of men with faculty appointments. Some liked (and like) the arrangement, but for those seeking a permanent and coequal professional career, albeit part time, there were no options. Initially what seemed like a good deal for the individual and for the institution evolved into something increasingly viewed as manipulative and exploitive. An obvious improvement would have been to designate some of the positions as permanent but part time, adjust annual workloads to meet the needs of the institution, and prorate the salary and benefits. Such innovations were not part of the experience or within the mental flexibility of the administrative minds of the day, so it was left to rationalize that 20 to 30 years of employment in the same position at the same institution was temporary. Thus, the option to stay at Harvard had short-term benefits and long-term limitations.

A second option for me was to work in the petroleum industry with Amoco in Tulsa, Oklahoma. Alan Shaw came to the University to recruit graduates and presented some of the advantages over employment in academia. One of the most obvious was salary. He asked what the offer was from Kent—it was $8500 for the nine-month academic year. His opening offer was nearly triple that from Kent, along with unexcelled research facilities, and an almost unlimited budget to carry out projects of interest to Amoco. The situation recalled a line by Goethe in which the devil offers Dr. Faust his "emancipation from the arid world of scholarship" (Williams, 1998: 191). The problem was that there would be little or no opportunity to pursue research started at the university or to explore broadening interests arising from that research. Another consideration was the lack of teaching. This was important because I was developing a fascination for teaching after my wide array of professional encounters, including the distinguished, the colorful, and the bizarre. There was also some altruistic motivation in that I had received a great deal from the academic community and felt it needed to be repaid. A strong impetus for undergraduate teaching later came from the impressive fact that George Beadle (University of Chicago), who won the Nobel Prize in Medicine or Physiology in 1958; Melvin Calvin (University of California at Berkeley), Nobel Prize in Chemistry in 1961; and George Wald (Harvard), Nobel Prize in Medicine or Physiology in 1967, all lectured in freshman courses at their respective schools. The message was that building laboratories, personal reputations, and world-class research programs is important, but it need not be at the expense of undergraduate teaching because

even those achieving the status and with the responsibilities of Nobel laureates were doing it with success and distinction.

A final near-option was to join the staff of the Department of Geology and Museum of Paleontology at the University of California at Berkeley. It was a near-option because a member of the faculty at Berkeley called with an unusual offer. He said he would go to the dean and request the appointment be made if I would promise to accept it that afternoon. Without the benefit of advice on so short a notice, I agreed because if it proved to be too bizarre a situation, it could be refused on the grounds that incomplete information had been provided. As it turned out, it was bizarre and the whole mess was another example of a situation in academia that removed one more layer of naiveté. The faculty of 14 in the department and museum was evenly divided between two factions that apparently loathed one another. The environment was so contentious that graduate students in one camp were cautious about taking courses with faculty in the other. The stalemate had existed for years, and each time a new appointee was proposed, the candidate would either be required to pledge allegiance to one group and then be voted down by the other, or some suggestion of affiliation would be perceived from such things as who picked him up at the airport or introduced him at the seminar. The dean had become so frustrated with the situation that he had withdrawn the position and rightly refused to hire an unseen candidate, much to the embarrassment of the caller and much to my relief.

The position at Kent State was recommended by Charles Heimsch, himself a graduate of Harvard, and then at Miami University in Ohio. It was an attractive offer because the university had made a commitment to upgrade its research programs, and specifically those in the biological sciences, including a new biology building; there was the chance to design my own laboratory in that building; the teaching load would allow time for research; start-up money was available as a contribution toward NSF funding; and the semirural setting provided the advantages of being near an urban area without having to cope with the distractions of an inner city. So in 1962, with all the personalizing determinants from the Sixth Ward, Dow Elementary, and Sam Houston High School in place, and with a veneer of professionalizing experiences acquired at Texas, Michigan, and Harvard, I began my ascent of the ivory tower.

PART II

The Ivory is Cracked (but Not Broken); the Tower is Leaning (but Not Fallen)

Kent State Protest

Kent State University

Kent State University opened for fall classes in September 1913 with 144 students (Hildebrand et al., 1993). It had its origin as something called, somewhat ironically, a normal school—that is, an institution for the training of teachers. When state revenues declined during the depression years of the 1930s, it was uncertain whether Kent would survive and, if not, what should be done with the buildings. On 4 May 1934 the finance committee of the Ohio legislature visited the campus to decide if Kent State should be converted into a mental institution. Those of us who taught there over the years occasionally wondered if it passed—perhaps we were working as staff in an asylum rather than as faculty at a university. One unusual feature of the campus was a building called Franklin Hall but with the name William A. Cluff on the pediment. He was secretary to the board of

trustees, and the building was named in his honor, but after the memory of Cluff was etched in stone, some irregularities were discovered in the university's financial accounts.

By 2010 Kent State had a faculty of about 2,500 and an enrollment of ca. 41,000 students (ca. 35,000 undergraduates) across eight campuses. That is an enrollment increase of 11% over 2009 and an all-time high.[9] It is one of 90 public universities designated as a Carnegie Foundation Doctoral/Research Institution, and the library is ranked 75th among university research libraries in the country. There are strong offerings in liquid crystal research, in the Kent/Blossom Music Program operated jointly with the Cleveland Symphony Orchestra, and in the library and information science department, which was ranked 18th nationally by *U.S. News & World Report* (2013). In 2009 the University received with Miami University (Ohio) a grant of $2.7 million for research in aquatic ecosystems.[10] Notable attendees were Drew Carey (who dropped out and became a successful TV personality), Joe Walsh (who dropped out and became the famed guitarist of The Eagles), and Michael Keaton (who dropped out and became Batman). More tenacious attendees included sports figures Lou Holtz, Jack Lambert, and Thurman Munson, talk-show host Arsenio Hall, fashion designer Linda Allard, and many prominent contributors to science, business, and the humanities. The campus is presently undergoing an impressive phase of expansion.

A tale of the city is that a gothic-like home in Kent was the model for the Bates Mansion in Alfred Hitchcock's 1960 movie *Psycho*. It looks similar, but the movie house was a creation of set designers Joseph Hurley and Robert Clatworthy,[11,12] The Cuyahoga River flows through Kent, and it gained notoriety when on 22 June 1969 it caught fire near Cleveland owing to high levels of hydrocarbon and other pollutants.[13] The event received national attention with a *Time* magazine story of 1 August 1969 about the river that "oozes rather than flows" and where someone "does not drown but decays" (Time, 1969). It epitomized the condition of the environment in the 1960s and was a rallying point for the Clean Water Act of 1972. Forty years later, methylmercury (one of the most common river pollutants), which is readily absorbed by the human body, has been found in every fish from 291 streams surveyed across the United States. The major source (40%) is coal-burning power plants (Economist, 2009b).

Along the Cuyahoga River in Kent there is a large white building that was the site of an unlikely business venture. The famed abolitionist John Brown built a tannery in Franklin Mills (Kent) in 1835, and with a group of investors he formed the Franklin Land Company.[14] One plan was to grow silk worms and establish a silk industry in northeastern Ohio. Although the building was suitable in the spring through fall, and mulberries were locally available in the summer,

the first severe winter demonstrated major flaws in the plan. As a passionate, even maniacal opponent of slavery—Abraham Lincoln called him a misguided fanatic—Brown killed a group of proslavery advocates in Kansas in 1856 (for the context of the times, see McCullough, 2011a: 225, 243) and was executed on 2 December 1859 after an unsuccessful raid on a federal arsenal at Harpers Ferry, Virginia, on 16 October 1859 (Horowitz, 2011).

These are some of the picturesque aspects of Kent and its environs, but like all institutions in the 1960s, Kent State was facing undercurrents of change with consequences that were far from whimsical. When significant shifts are announced in an institution's direction toward more research, graduate-level education, and a greater national presence, many long-term faculty and administrators find themselves on unfamiliar ground. They are called upon to deal with problems, people, and programs that were not part of their background or their intention to be primarily undergraduate teachers. At Kent, most of the faculty at the time had little experience in securing private foundation or federal grants to support research, postdoctoral students, technical support staff, or significantly reduced teaching loads for new faculty, and especially with the eye-opening costs. There were complex federal regulations for ensuring laboratory safety, proper disposal of radioactive and chemically hazardous waste, new and complex accounting procedures, nebulous guidelines for collaborative studies with colleagues at other schools and in foreign countries, and substantial penalties for failure follow the rules. Under these new conditions, and with the ground shifting beneath them, there were the usual manifestations of uncertainty, including resentment, a pretense of dogmatic certainty about what is best for the institution, criticism of new policies and programs, and efforts to maintain control over the increasingly unfamiliar. Other frequent symptoms at Kent State in the 1960s were greater secrecy about decision making, increasing unavailability of the chairman, appointment of supporters from the old guard to intradepartmental positions, and the unwavering support of likeminded deans and other administrators caught in the same transition for which they also were unprepared. An aggravating but amusing ploy of the chairman of biological sciences at Kent, Charles V. Riley, was to place bad news about teaching loads or requests for funds in the faculty mailboxes around noon on Friday and leave for the weekend. The day before long holidays was an especially treacherous time for checking mail.

Another source of difficulty for mid-echelon universities like Kent was competition from the many other institutions also announcing intentions to move into the big time. This rush to science was brought about by the wake-up call that rang out loud and clear on 4 October 1957 with launch of the Russian Sputnik satellite. It was at the height of the Cold War, and it was during the more

idealistic times of the Kennedy era. The reaction to the emergence of Russia as a serious player on the scientific scene was partly an altruistic desire to contribute toward maintaining technological parity with a global competitor. There was also the anticipation that vast amounts of federal money would be forthcoming for research. Enrollment (tuition income) was bolstered by passage of the G.I. Bill (Servicemen's Readjustment Act) in 1944, providing college or vocational training for World War II veterans, and versions of the G.I. Bill continued for veterans of later wars until 1965. Enrollment was further sustained by deferments from the Selective Service Draft for college students doing well and majoring in essential fields (e.g., science, engineering, medicine, nursing, pharmacy). Additionally, there were an increasing number of women entering college and who would eventually come to constitute the majority of both undergraduate and graduate students (see Chapter 9). There was a great deal of enrollment- and alumni-oriented hype aimed at creating the image of an institution on the go and moving with the times. The quest for a place among America's research universities created a whole cadre of new problems as mid-echelon schools strove to emulate the established great research universities (the ever bigger and better model, or climbing the Carnegie ladder; see Christensen & Eyring, 2011: chapter 13)—a demanding faculty of young upstarts, a board of trustees calling for more grants, publications, doctoral students, and enhanced national and international prominence; and the ubiquitous problem of inadequate funding to support the verbiage, all happening on an unfamiliar and slippery slope. New buildings had to be constructed, and existing laboratories and classrooms redesigned and equipped to accommodate the teaching and research of a new era. At Kent, five science buildings were constructed within seven years, and funds had to be found simultaneously to renovate the old quarters for other departments. It is a fact of life that state officials more readily provide money to construct monuments to their administration than to staff, furnish, and maintain the buildings. The entire third floor of one new science building at Kent remained vacant for years owing to lack of funds.

There was another problem that would not become manifest until about the 1990s: the rapid influx of new staff in the 1960s later end-loaded institutions with senior staff, making it difficult to find funds, space, and courses for new appointees. Another problem to emerge later was that a large number of faculty hired in the decade of the 1960s meant that a large number of replacements had to be hired at an even greater cost in the decade of the 1990s when the golden age of federal support for basic research was beginning to wane, becoming more competitive, or being redirected. My first grant from the National Science Foundation in 1967 was for $22,200 and involved only myself as P.I. (principal

investigator). A grant submitted in October 2011 was for $583,000 and included 10 collaborators from nine different institutions.

Administrators had to face these and other realities of the sudden great race for prominence, and this caused difficulties at many schools. In order to understand the administrative capabilities at small schools trying to suddenly upgrade their research and graduate programs in the 1960s, it is worthwhile to note two common pathways to administration. One is represented by the likes of Geoffrey Norman, Alfred Sussman, and others at Michigan where, after a long, distinguished career in research, they moved to full-time administration—Norman as vice president for research and Sussman as dean for graduate studies. A variation on this theme is represented by Reed Rollins at Harvard and others who continued to do research while also serving as administrators of a department, institute, or program. Individuals following either of these pathways are worth their weight in gold because they have a lifetime of experience in research, grant procurement, and publication. They have professional contacts and have served as consultants, political advisors, panel members, and officers in national and international societies; as organizers of meetings and symposia, editors of books, and journals; as directors of laboratories; as supervisors of graduate students and research personnel; and they have carried out the myriad responsibilities that face many young faculty. Additionally, an administrator with an extensive background in research at a prominent institution is often involved in determining national trends and setting policies for the future. In this role they can advise their university and its staff about developing trends and opportunities. A more subtle but important asset is that they usually do not carry an excessive load of psychological baggage in the form of resentment toward younger faculty who are achieving success because they have already traveled that route themselves. As part of any active research program, there is often professional recognition, grants and awards, speaking invitations, foreign travel, and a sense of contributing something original and worthwhile, and other feedbacks an administrator with earlier success in research has already experienced. Thus there is a greater likelihood of openness, understanding, encouragement, guidance, and support for others.

However, a different route to administration, particularly at smaller universities, is often necessitated by financial realities and reinforced by tradition. Periodically, lower-echelon positions open for an assistant chairman of a department, an assistant dean in the graduate school, or an associate dean in the college of arts and sciences. They typically involve vast amounts of paperwork and frequent meetings with irate parents trying to shift blame for their offspring's failing records. The first step in filling the position is to find someone who would want it. There is usually a slight increase in salary because it is a twelve-month rather than a nine-

month appointment, and a small supplement may be added for the duration of the position. For someone with a fascination for titles there is the further appeal of being called assistant chairman or associate dean, and the prefixes can sometimes be dropped in polite conversation as the situation allows. Another consideration in selecting administrators via this route is determining who can be spared from the department with the least impact. The loss is sometimes viewed as a benefit, especially if a replacement position is part of the negotiations. If not, the teaching load is taken up by other members of the department or by temporary part-time appointments. The qualifications of the instructor are sometimes startling to novice faculty, especially if the course is a required part of the curriculum with a large enrollment and must be offered every semester. As a paleobotanist I was once asked to teach an upper-division course in genetics. A hard-working parent, serious student, or competitive pre-med student would likely be shocked at the way circumstances sometime dictate how courses are assigned at small universities striving for relevancy and stretched for resources.

When an offer is made to one of these local candidates for an administrative post, it is usually accepted. The applicant likely did not have a cutting-edge research program and probably did not receive many rewards or much positive feedback from teaching, otherwise he would not be leaving a field in which he had been trained to enter one in which he had little or no background, knowledge, or experience. Another factor operative in any hierarchy is that persons already in place often do not revel at the prospect of having exceptionally capable people following too close behind.

One consequence of the above scenario is that, having been taken from of an uncertain, marginally productive, and often unrewarding career, the new administrator is deeply beholden to those giving him a new lease on life. There can even develop an almost adversarial attitude toward faculty that question administrative decisions, especially if those decisions are not clearly understood and difficult to defend. The cubicle becomes home, and mundane tasks are carried out with unfailing loyalty; after all, when rewarding careers in teaching and research are ruled out, the available options at a university are limited. Over time, as people retire or move to other positions, the once lowly administrative gopher slowly rises toward the top. When the dean leaves, and if the search is in-house, guess who emerges as the most senior, dedicated, and faithful person to become leader, innovator, visionary, and policy-making officer of the college? The sequence is less common now, but new faculty still need to know the background of administrators because their strengths, weaknesses, and attitudes can often be a benefit or a real inconvenience.

In the 1960s and 1970s these administrators additionally had to deal with

the novel and ominous signs of widespread, organized student protest against the Vietnam War; intensifying civil rights issues that required knowledge of the law and a tactful approach to often emotionally white-hot situations; and the emergence of unions on college campuses. Concern was also being expressed by some faculty and students about the cost of intercollegiate athletics during a time of increasing tuition and dwindling academic budgets, there were early hints of an overall decline in the quality and competitiveness of American education, and increasing resources were being diverted to remedial courses for poorly prepared high school graduates. These were among the immensely difficult challenges facing administrators at this pivotal time, and the best answers would require substantial intellect, a worldview of events, and objective thinking uncomplicated by biases and a defensive "often-wrong-but-never-in-doubt" mentality. No inexperienced "blackbirds" should apply, but they did, and the two pathways to administration often lead to profoundly different results among American universities.

Another reality in the 1960s was the difference in capacity for quick-time response to emerging needs and opportunities between already established major institutions and newer ones aspiring to research credibility. For example, intensifying urban sprawl, intercity decay, congestion, school deterioration, drugs, juvenile delinquency, and crime were critical issues facing almost all metropolitan areas with greater intensity in the 1960s. Large universities with long experience in the ebb and flow of social trends, and with the resources to study them, could assemble specialists from different departments, nearby institutions, and businesses, in various combinations, to form multidisciplinary institutes to train graduates to address such problems of the times. Popular programs were City Planning and Institutes for Urban Regionalism. When other situations demanded attention—for example, the current environmental crisis—resources could be rearranged to focus on the new challenge—for example, an Institute for Environmental Studies. The smaller schools were at a disadvantage because even though they could emulate these programs in name, the funds, experience, flexibility, and the interest of subsequent university administrations were generally lacking to develop the centers to a high level and to sustain them on a long-term basis. Thus schools with limited resources could create the imagery of keeping pace with the changes in higher education, while in reality they were falling behind relative to older and more prestigious schools. Even modest changes required making difficult decisions about which departments and programs would get support (often it was the sciences because they could draw in grant money), which would be maintained as mostly undergraduate teaching departments (often the social sciences, arts, and humanities), and which would be eliminated. The decisions involved trying to read national and global trends

by those with little experience in doing so. Who would have guessed years ago that language courses in Chinese, Hindi, Brazilian Portuguese, or Arabic; courses providing greater awareness and better understanding of the Muslim culture; or those imparting knowledge about the geography and history of Asia and the Middle East would be of such educational importance to political, business, social science, and science curricula? Or that a lack of them would render the institution and its graduates at a competitive disadvantage? Geography and languages have continued to be de-emphasized in the American curriculum and departments eliminated just when their relevancy to the new world order is increasing. Our national deficiency in these subjects as background for understanding events in the modern world is recognized, for example, in efforts to publicize their importance and fill the gap by new PBS web pages on the geography of Pakistan and Afghanistan.[15]

For midlevel, home-grown administrators, trying to distinguish real intentions from empty pronouncements by politicians and higher administrators was a further complication. It was not an arena for the weak of mind or the faint of heart. Decisions that seemed good at the moment could have a damaging effect on training graduates able to cope with an ever-changing world. Most small schools maintained programs they were familiar with at a level they could afford and made adjustments as necessary and as conditions permitted. Already established distinguished liberal arts teaching colleges had it easier because their reputation for excellence allowed them to remain centers for quality teaching, recruit good students, sustain donor support, and maintain undergraduate enrollment while enhancing research capacities in selected fields. Schools with lesser reputations entering the quagmire of modern-day research without the reputation, financial resources, or administrative guidance found it more difficult. Many institutions tended to idle in place, caught between the pressures to become prominent centers of research, but without the means, and to adapt to the changing needs and technology of modern-day instruction, but without experienced and qualified guidance.

Also of concern is that there does not seem to be adequate awareness among the general public that deterioration or inept management of any system, once it sets in, is an insidious trend that takes vast amounts of money and generations of skilled, dedicated people to rectify. An example from global warming is that "a long-term climate model projection suggests that, even if carbon dioxide emissions are eliminated entirely by the year 2100, and global mean temperatures consequently stabilize, the Southern Ocean could continue to warm for thousands of years" (Nature Geoscience, 2011: 493). Chlorofluorocarbons appeared in the 1920s, and by 1970 they were found to be damaging the ozone layer. If current

strict limitations are maintained, that layer may recover by 2050—taking 130 years for a relatively quick fix. In education, Jonathan Cole (2009) notes that so many technological advances have been the result of basic research done at universities—the Internet, radar, global positioning systems, magnetic resonance imaging, and others. In a letter to *Time* (2011a), a reader adds that, "as all levels of education are devastated by budget cuts, we should not be surprised to see our position as world leader filled by other, more enlightened nations." Other facets of modern higher education and academic leadership, including attempts to essentially reconstruct a university from the beginning (e.g., Ricks College/ Brigham Young University—Idaho) with the goals of education-preparation-values unfettered by the costs of intercollegiate athletic programs and the quest for research prominence, are discussed in *The Innovative University: Changing the DNA of Higher Education from the Inside Out* (Christensen & Eyring, 2011) and "Winning by Degrees: The Strategies of Highly Effective Higher Education Institutions,"[16] as well as by Bok (2006), Lewis (2006), Astin et al. (2010), Buller (2010), Palmer et al. (2010), and Bolman and Gallos (2011). In a PBS interview on 8 February 2012 with Zbigniew Brzezinski, former national security advisor (1977–1981), he noted, "We are a democracy. We can only have as good a foreign policy as the public's understanding of world affairs. And the tragedy is that the public's understanding of world affairs in America today is abysmal. . . . It is probably the least-informed public . . . among the developed countries of the world" (PBS NewsHour, 2012; also see Brzezinski, 2012).

In a CNBC (2009) interview at Columbia University with Warren Buffett and Bill Gates, Buffett was asked, "What worries you most about the future?" His answer—"The condition of our education system."[17]

Service, Administration, and Teaching

Service and Administration

New faculty hired primarily as contributors to research and graduate programs usually are expected to provide some service and administration. It does not require the Wisdom of Solomon to realize that some departmental committees are genuinely for the purpose of receiving faculty input on important issues while others are a façade to create the illusion of faculty participation. Among the latter are committees charged with developing 10-year plans every few years and with issues involving the broad governance policies of the university. The difference between committees that are worthwhile and those that are rudderless time wasters is often evident by the chairman's drifting pontification at the start of such meetings and the frequent meanderings into interminable irrelevancies.

My awakening to the realities of departmental administration came when the chairman of a five-member committee announced that we all had to vote on the issues (no abstentions), and, as chairman, he would vote only in case of a tie. This seemed unlikely even to a graduate of "Pop" Reddick's mathematics class. A committee report recommending that, based on our findings, the university should adopt a general college for freshmen and sophomores was returned saying essentially that we had come to the wrong conclusion. The same report was resubmitted but concluded that, based on our findings, the university should "not" adopt a general college, and we were thanked profusely for our efforts.

Similar experiences speak volumes about the efficacy of departmental committees charged with predicting long-term future events and dealing with large-scale issues that likely had been decided elsewhere. Instead, I chose library representative, a position that included negotiating, enhancing, and juggling the departmental library budget, prioritizing requests for journal subscriptions, recommending cancellations as was often necessary, and allocating book purchases among a rapidly changing biological sciences faculty. It was a worthwhile 17-year venture that produced satisfactory holdings for those actively using library resource materials and an eye-opening reality check for a new academic realizing that most of the faculty there at the time never requested a book or journal for either teaching or research during the 17-year interval. The task for recent appointees engaged primarily in teaching and research is to contribute their fair share to service and administrative activities that are meaningful.

Teaching

In my academic fabric there is a weak strand directly traceable to early personalizing and later professionalizing experiences. It is impatience, even a disinterest, in students who are presented with exceptional opportunities and then fail to take advantage of them. One reason for this impatience is because such opportunities often involve considerable time and effort by faculty on behalf of students to help them gain research opportunities, financial support, and admission to prestigious graduate schools. To receive a scholarship to an important institution and then refuse it or drop out for reasons that seem less than compelling places the recommending faculty member and the department in a poor light vis-à-vis future applicants. A few of these experiences early on resulted in the practice of my trying to judge the staying power and maturity of a student, as well as his or her inherent brightness, before investing too much mentoring capital. Undergraduates from small schools especially need to be advised about the responsibilities and expectations of the big time before trying to enter it.

Complicating the task of adjusting to a changing educational environment

was that not all innovations being proposed at the time were of equal value. For example, in some Colleges of Education the need to maintain enrollment resulted in the rationalization that learning how to teach was equally or more important than a fundamental command of the subject. As noted by Laurence Krauss (2009: 32) in his *Scientific American* article on C. P. Snow, the vast majority of middle school physical science and math teachers still today do not even have a science degree. Although appealing for enrollment purposes, and essential for marginally qualified students entering education as a college of last resort, this contributed to a generation of teachers and students unqualified to sense the subtle trends or to handle the intellectual demands of a rapidly changing and technologically complex world. When suddenly standards were imposed (e.g., the No Child Left Behind Act, 2001), they were impossible to achieve given the financial support provided and the qualifications of existing personnel expected to quickly implement the change. The Atlanta School System scandal is one consequence of this situation, where teachers helped students cheat on examinations to meet performance requirements (Wilder, 2011).

Another early educational aberrancy was emphasis on phonetic spelling, which reduced the ability of a generation to clearly communicate in an increasingly complex world. As graduates of these educational approaches became teachers themselves, there was a downward spiral in the preparation of many students being fed into universities that were forced to accept them to maintain enrollment. These educational innovations created, and continue to create, the additional financial burden of offering marginally successful remedial courses and that have introduced a marked unevenness among the students in undergraduate classes with which college faculty in public institutions must cope. Universities, two-year colleges, and online technological schools all have a vested interest in the success of primary and secondary education, as well as in college-track and other programs intended to direct students toward realistically achievable goals and suitable careers at an appropriate institution. At a tradeshow in Chicago in September 2010 it was announced that at this time of nearly 10% unemployment, over 250,000 jobs were open but unfilled because properly trained technical workers were not available.

An innovative concept has been developed by Clayton M. Christensen and discussed with reference to education by Christensen and Eyring (2011). It is called "disruptive innovation," by which is meant that changes that may cause consternation among the old guard often result in new methods and attitudes beneficial to the discipline. It is analogous to mutations in biological systems that disrupt the genetic status quo, allowing competition to improve the product through natural selection. For example, early online colleges had shortcomings

(no campus environment, little direct student–faculty contact) but were more affordable and conveniently available to those with full-time responsibilities of work and family, limited transportation, and various other challenges. Some online colleges have improved, however, by bringing groups, advisors, and outside speakers together through conference calling, forcing traditional universities to reexamine ways of offering instruction, the costs of an ever-expanding campus infrastructure, and priorities (e.g., perpetual investment in an ever-elusive quest for a nationally prominent and profitable athletic program).

An aspect of the process that needs to be carefully considered is the potential human toll and damage to institutions when an innovation proves disruptive but not beneficial. Examples are the phonetic spelling and method-over-knowledge experiments as a means of enhancing enrollment previously discussed and from which the country is still reeling. Before disruptive ideas are implemented and allowed to become policy, it is incumbent on the experimenters to carefully think through the long-term consequences. Otherwise a generation of students will have to be written off as just being at the wrong place at the wrong time—consequences of the friendly fire of innovation. Surely a thoughtful evaluation of approaches that advocated the dumbing down of speaking, reading, writing, and form-over-substance, in an era of rising technological, political, and cultural complexity would have given pause for thought.

The faculty in the Department of Biological Sciences at Kent State in 1964 included mostly reasonable people with a wide range of teaching skills, along with the expected number of blackbirds—called *glutei maximi di Equii caballi* by some younger faculty, which was not widely understood or particularly helpful. There were a few nationally recognized researchers, such as Benjamin Foote in entomology and John Morrison in cytology. They were also among the most effective teachers, but that is not surprising given the examples of George Beadle, Melvin Calvin, and George Wald mentioned earlier. Research benefits teaching because otherwise it can become just talk about other people's talk, and a lot can get lost in the translation. Experiences beneficial to teaching often come from incidental encounters associated with research. At a conference in Punta Cana in the Dominican Republic I spent a few moments explaining paleobotany to Oscar de la Renta while he tried to enlighten me about haute couture. Earlier my major professor Chester Arnold had the opportunity to explain the rudiments of paleobotany to Prince Philip, Duke of Edinburgh at a gathering in New Delhi. Such events can lend vitality to lectures, and capable students pick up on the enthusiasm of a teacher energized by these experiences and actively engaged in generating some of the information being discussed (viz., when the person who wrote the book is standing at the lectern; see Christensen & Eyring, 2011: 135).

They are also unsettlingly perceptive in distinguishing between genuine scholars and those trying to drape the mantle of greatness over their own shoulders.

Most of the teaching faculty at Kent State were longtime purveyors of standard material, sometimes with distinction and sometimes with humorous effect. The method of one lecturer in general biology was to place the textbook on the lectern and read from it verbatim. On one occasion his stentorian renderings became more and more regular, his head lowered, and he gradually fell asleep during one of his own lectures. Another lovable inmate of the institution taught genetics. One day he asked me if I knew anything about the Harley Weinstein hypothesis (known to the rest of us as Hardy-Weinberg). Harley Weinstein sounded like a Jewish biker, and I could honestly say I had never heard of such a thing.

There was an odd occurrence one night in the old Liquid Crystal Research Building where I had an office. Liquid crystals have a flexible crystalline structure with properties intermediate between solids and liquids. The thin surface films are noted for their brilliant shifting colors that change with minute differences in the ambient temperature—soap bubbles are an example, and thin-screened color TVs are an application. One study at Kent State was designed to see if these changes were sensitive enough to detect the heat-generating concentration of blood vessels in very early breast cancers. A model was painted with liquid crystals, and although they did form a fantasia of shifting colors over her body, they were not specific enough to be of diagnostic use. It was an unusual kind of research, and some discretion was required, so the painting took place at night. Afterward, as the model was walking down the darkened hallway to the shower, all lit up, shimmering, shining, and nude, a newly arrived Asian student unexpectedly ran into her, and it took some hours to get him calmed down. In a confused amalgamation of lecturing philosophies about focusing on the lecture, and not on the lecturer, one faculty member gave a departmental seminar dressed as a rabbit.

Not all early experiences at Kent were as whimsical as the sleeping lecturer, the clueless geneticist, the luminescent model, or the hapless hare. These incidents were relatively harmless, but there were real difficulties facing a university attempting to climb the ladder to research prominence. These difficulties provided a reality check for new faculty and often revealed the more challenging side of higher education. When a new position was approved, it usually was the result of hard-fought negotiations and competition with other departments for limited resources. There was also competition with larger established universities for the most talented graduates. Thus, when a new appointee in a key position did not live up to expectations, it had a significant and often long-term effect on departmental programs. The normal procedure would be to vote for nontenure at the end of a several-year trial period. At smaller schools with no tradition of

making such hard choices, and with a majority of the faculty not involved in research or graduate student training anyway, terminating the employment of a colleague performing at about the same level as most others was difficult. In nearly four decades at Kent State, the rabbit was the only one in biological sciences ever denied tenure, and this reluctance to make hard choices slowed progress toward excellence even further. What was viewed as a kindly act by some perpetuated subpar instruction on students trying to get the best training at considerable cost for entering a highly competitive world.

When faculty with active research programs began arriving at Kent, there was some apprehension by the old guard about whether the new arrivals would "understand the situation"; namely, would they continue a comfortable lifestyle unencumbered by too ambitious a pursuit of research or too innovative a teaching methodology that would be "disruptive." The chairman asked me the first year how long I planned to stay at Kent. Another revealing dialogue occurred when a chance arose to interview a Harvard faculty member disgruntled with things on Divinity Avenue. A colleague in the department came to my office and asked, "How would you like it if someone in your field wanted to come here?" It was a baffling question until I finally "understood the situation."

The women in the department were mostly temporary, part-time employees who taught undergraduate biology laboratories. The one exception was Dorcas Anderson, a nonresearch Ph.D. who had taught in the nursing program for years. She remained at the assistant/associate professorship level for decades while males with comparable records were routinely promoted over her. One reason given was that she was single, and most of the men had families to support. The inaneness of that rationalization was manifest by the irrelevancy of marital status to professional qualifications and by the fact that single males were routinely promoted. Nonetheless, she frequently expressed satisfaction with the arrangement, faithfully taught her courses, and clearly was not a threat either to the then-traditional role of women or to the uncomplicated lifestyle valued in the department. It was an arrangement that had existed for years, it was apparently acceptable to all parties, and so be it. When the department and the university later found itself the subject of a federal discrimination suit (and was found in noncompliance with federal guidelines), Dorcas was quickly promoted to full professor. She benefited from the stand for equality taken by other women at Kent, and across the county, but refrained from voicing support for these colleagues. Shirley was an unknown factor at Kent, being a woman with a Ph.D. from Michigan, a Fulbright Scholar to Denmark, and a Postdoctoral Fellow at Harvard. She had an active record of published research, later was the recipient of several grants, and was a frequent panel member at the National

Science Foundation. Still later she was president of the American Society of Plant Taxonomists. These credentials generated some anxiety, especially for the faculty member already concerned about others in his field coming to Kent. However, that was the reality of the time and place, and nothing was expected from the department except support for research as available, courtesy, civility, and professional respect. Instead, Shirley was given a desk and chair in a filthy corner of an open departmental museum storeroom with the expectation she would stay there indefinitely, quietly, with gratitude, and was told to "pursue her hobby on her own." As will be seen later, that was a mistake.

When I began facing the full responsibilities of teaching for the first time, the advice received from mentors was invaluable. One suggestion was to keep in mind the difference between popularity and respect. An easy grader is often popular but rarely respected. Some gifted individuals can be both, but between the two it is best to err on the side of respect. Dumbing down is not a recent phenomenon. The Reverend Edward Phillips (1630–ca. 1696), a nephew of John Milton, wrote an early dictionary regarded as of doubtful originality, little merit, but of great popularity (Boorstin, 1983).

The other advice was to get course lectures prepared, update them as necessary, and then get on with other responsibilities. This is opposed to reinventing the wheel every year, perhaps in compensation for the lack of research and because, consequently, time is available. One colleague, representing an attitude commonly voiced at small universities in transition, said he thought every hour devoted to research was a dereliction of duty. Later on there was some satisfaction in knowing that when I was given the Distinguished Scholar Award for Research, and then the Student Advisory Council Award for Outstanding Teaching, it must have been a difficult pill to swallow. The value of such awards is that they signal a reasonable balance is being achieved between the two singularly important tasks of teaching and research. The former attitude represents a façade of concern for excellence while enmeshed in a comfortable mediocrity.

Although being engaged in research makes it easier to be an effective college teacher, it is not an absolute requirement for every member in a department. The essential factor is whether the individual is professionally active or professionally inert. Almost every national professional society has a teaching section with newsletters to be edited, annual meetings to be organized, and web pages to be maintained where innovative methodologies are discussed. For example, there have been workshops on "Helping Students Use a HOT Skills Wheel," "Undergraduate Research," "Teaching Plant Anatomy through Creative Laboratory Exercises," and "Mentoring: What Does It Look Like in the Science Community?" National awards are given for excellent and innovative teaching,

and active participation in these societies is valid documentation of professional activity outside of research. Every major publisher of textbooks offers seminars, workshops, instruction in the use of supplemental materials, and even sends authors on speaking tours to address faculty and students about new trends in teaching. Writing supplemental material to these texts for courses at a particular university is worthwhile. For example, Shirley and I wrote the laboratory manual used at Kent and the University of Akron for many years. Almost any business will accommodate visits by student organizations and provide personnel to talk about course backgrounds beneficial to employment in their company. As part of the Biological Field Studies course, students were taken to the St. Louis Zoo during the heady days of Marlin Perkins of TV's *Wild Kingdom* to hear talks about animal conservation, endangered species propagation, and other research carried out at modern zoological parks. Personnel at the Missouri Botanical Garden provided information on employment opportunities both at the research level and for herbarium and horticultural staff. Not unexpectedly, a particularly popular visit was to the Anheuser-Busch Brewery in St. Louis to hear a lecture on jobs for master's degree holders and even undergraduate students with training in microbiology. Also not unexpectedly, when questionnaires about the trip were returned, a frequently mentioned highlight was when the Dalmatian dog ran in and jumped up on the wagon pulled by the Clydesdales.

Beyond these activities, there is always the opportunity for faculty to engage in optional projects depending on the motivations conditioned by the personalizing and professionalizing experiences discussed earlier. Some contribution may be made to long-established programs, and one I enjoyed was serving as faculty advisor to the undergraduate Beta Beta Beta Biology Honorary Society (1970–1974). Membership had declined to just four, but eventually it increased to around 30, demonstrating that good students are willing to participate in organizations that offer meaningful activities. Colleagues gave talks about their research, led field trips (e.g., to the Carnegie Museum in Pittsburgh and Duke's Marine Biological Station in North Carolina), and the faculty hired members of the honorary to work on grant-supported projects.

Participation in all these activities makes it easier for a limited number of faculty to justify service (e.g., 20%) and teaching (e.g., 80%) if they choose to exclude research (e.g., typically 40%–60%); after all, the time has to be spent doing something. It also makes it easier for other colleagues to judge the quality of their professional engagement. Addison Lee coordinated the freshman biology course at the University of Texas during the 1950s and 1960s, and he was a respected scholar in higher education. But it was expected he would be the only one in the department devoted full-time to undergraduate teaching. Service and

teaching in the absence of publishable, grant-supported activities at a university trying to develop a respected research program is difficult to justify. With 40%–60% more time available, an enhanced level of service and excellence in instruction is only to be expected. Meritorious achievement presumably must go even beyond; for example, by participating in writing a text or laboratory manual, serving as officer in a professional organization, or developing and offering one of the aforementioned national workshops. Touting the value of teaching in the absence of research, while performing at only an expected enhanced level of excellence, is (or should be) a shaky basis for expectations of promotion, merit, and tenure.

Participation in already established activities such as the biology honorary society is worthwhile, but it is especially satisfying to create new programs for which there is little precedent. I initiated the Undergraduate Assistantship Program at Kent in 1970. At first there was little interest or financial support for something that was not tradition, but after it became successful there was almost more money than qualified applicants. At the end of the freshman year, students who had completed two semesters of the biology majors course with grades of at least B, and who had an overall grade point average of at least 3.2 (out of 4.0), were eligible for the assistantships. The top candidates were invited to assist a faculty member or graduate student in one of the freshman biology laboratories for a stipend of $175 (1970s money), and each received a letter acknowledging their participation to include in their résumé. In the biology honorary society there were coordinated discussions about the value of keeping documented evidence of special achievements and how to prepare résumés. There were up to 10 assistantships per academic year, and altogether 150 students participated. Interestingly, when the program was eventually turned over to the faculty colleague who said teaching was the only truly worthwhile activity at a university, it dwindled out of existence—the difference between being professionally active and only verbally active.

It was clear that good students at Kent State were as capable as good students anywhere as witnessed by those who went on to successfully complete graduate work at prestigious universities across the country. The same was true of the good faculty, which included many nationally recognized scholars. The difference, especially among the students, was that they were scattered among a vast number whose presence at a university, as opposed to a two-year community or technical college, was of questionable benefit to either the student or the university. There were intervals when enrollment at Kent was so low and competition for students so keen that those with a D average from high school could be admitted. However, even among the good biology students at Kent in

the 1960s, 1970s, and 1980s, a common characteristic was that although bright, many had not had the opportunity to travel outside the Midwest or even the state. With profound social changes looming on the global landscape, it was a limitation in their perspective that needed to be addressed.

Biological Field Studies in Mexico

Student field courses to Mexico were not widely available in the 1970s, and those that were usually involved short excursions into northern Mexico or stays centered around a biological station. Longer trips to Latin America were essentially commercial ecotours, where a faculty member and a relatively small number of participants would fly to a site where food, lodging, and facilities were provided. The latter are becoming increasingly popular as prolonged visits and extensive travel in foreign countries become more complex, expensive, hazardous, and with liability implications of monumental proportions. Such trips provide opportunity for in-depth study and experimental projects in residence at a particular site, and they are relatively straightforward to organize. However, another approach is to offer a broad-scale survey of a country or region that gives the participants

experience with a wide range of ecosystems and cultures. This approach is more time intensive and immensely complex to organize, but it best addressed the needs of students at Kent in the 1970s and 1980s.

Organizing and Financing

Earlier I mentioned that the decision by faculty to initiate optional teaching and service activities, even if without compensation, is based on motivations derived from early personalizing and later professionalizing experiences. For the summer field courses at Kent, a central requirement was that they be available to students with limited financial resources who were routinely closed out of projects involving foreign travel. In calculating the real cost to students it was further necessary to recognize the loss of summer income while on the trip, which was often needed for attending college in the fall. These financial limitations precluded paying airfare and room and board at facilities charging commercial or near-commercial rates.

In the first year of the program (1974), we used three 15-passenger vans with the back seat removed to store supplies and allow 10 persons per van. The course was oversubscribed, but the parents of one student, apparently concerned about the reliability of university vehicles, purchased her a new van together with enough spare parts to virtually build another one. No one knew what most of the parts were for or how to install them, but it was reassuring to know we were carrying the good part of a spare van in the trunk. They were also worried we might not have enough to eat and gave us a case of Beanie Weenies (canned baked beans and frankfurters). We opened a can the first night out, and although everyone was grateful for the gesture, the rest were still unopened at the end of the trip. The amount of food 45 college students can consume is staggering. The change in the quality of that food over the years is vividly reflected in pictures of the 1974 group compared to a random cross section of the youth of today.

The Acme Grocery in Kent gave us discounts in exchange for purchasing nearly $700 (1974 dollars) worth of food at their store. Planning was important because supplies had to be sufficient to feed 45 people three meals a day for 30 days ($45 \times 3 \times 30 = 4{,}050$ meals). Food could be purchased along the way, but after crossing the border, safe drinking water was less readily available, and a 3- to 4-day supply had to be carried. Forty-five people with trots on a camping trip is almost too much to contemplate. Free purified water could be obtained from breweries like Corona and bottling companies like Coca-Cola and Fanta for the 100+ gallons needed each day.

Hold-harmless agreements had to be signed even though they were of questionable legal value, and inoculations were required for tetanus and hepatitis.

The pre-med students worked on the gullible by telling them they would have so few vegetables they could get scurvy and should eat a lemon every day. One student even asked about beriberi. She was told it was a disorder of the nervous system caused by a thiamine (vitamin B_1) deficiency common among chronic alcoholics, people subsisting on polished rice, and those recovering from gastric bypass surgery. It was common in Asia before the 1800s. The symptoms were weight loss, emotional problems, impaired vision, weakness, swelling of bodily tissues, irregular heartbeat, heart failure, and death, and at the first sign of these symptoms she should let someone know. Two parents asked about vaccinations against diseases that had been latent for centuries or had never been known in the Western Hemisphere. They were told that if the Cleveland Clinic did not carry drugs for treating the plague it was unlikely we would encounter it in Mexico.

At times the unrelenting concern by parents could be trying, but on the 1985 trip these concerns were brought into better perspective. One student revealed that although her parents had provided her with considerable freedom and financial support, they never showed much interest in what she was doing as long as it did not interfere with their own lives. It was the adolescent's concept of the ideal childhood—no rules, no prying, and no discipline. However, the down side is expressed in a line from the 1997 movie *Men in Black*—"Try it." The results were sad and manifested in the student's sensitivity to peer comments about decent parents and in a particular resentment to male authority figures. After seeing the consequence of virtually no parental concern, I gained renewed respect for the deep interest of the other parents.

Manifestations of such blackbird syndromes are widely evident throughout society, including the scientific community. Cyril Dean Darlington was the renowned cytologist mentioned earlier (see Chapter 4) who was abrasive to the point he was viewed as a threat to science. He was shouted down at a national meeting by an angry audience, and a colleague from another country volunteered to cross the Atlantic and punch him out. Darlington's personality was not surprising, considering his father once told him his (Cyril's) conception was an accident and one he swore he would never repeat (see Gratzer's 2008 review of Harman & Dietrich's *Rebels, Mavericks, and Heritics in Biology*, 2008).

Each van was completely equipped so that if one became separated it could function independently until meeting up with the rest. On the first trip CB radios were installed, but an incensed motorist called the university because of a misunderstanding arising from the fact that Kent State students are known as the "Flashes." Each van had five tents with sleeping bags, two Coleman stoves, lanterns, fuel, ice chests, first-aid kits, and miscellaneous items like towing chains, shovels, extra gas, three 25-gallon water cans, canteens, Lomotil, halazone

(chlorine) tablets, geology hammers, compasses, altimeters, a tool box, plant press, insect pins and boxes, binoculars, a slide projector, and a set of readings on the botany, zoology, geology, and archaeology of Mexico. Much of this was donated, or was bought by the department, and ultimately the students had to provide only personal items and whatever spending money they could afford. A few disadvantaged students were designated assistants, and their expenses were provided from other sources. Over the years as word of the trip circulated, donors gave money so that more of these students could participate. They did not know their benefactors, and this was their chance encounter with exceptional people.

It was a tribute to the loquaciousness of students that so many convinced anxious parents to let them go on a five-week camping trip through Mexico with 45 people they did not know. Even so, I was interviewed extensively about the qualifications of the staff, safety issues, mail delivery, and something in the guidebook called *larga distancia*. Occasionally there were thinly veiled implications of what would happen if any harm came to their children. In turn, it was made equally clear to them that reasonable behavior was a nonnegotiable item. If we returned with fewer people than when we started, that was our problem; if we returned with more that was their problem. Amazingly, there were no significant discipline problems in the entire 12 years of the trips.

Additional funds were contributed by the College of Arts and Sciences and by the president's office. The strategy was to get the *Daily Kent Stater* and other newspapers to run stories about KSU students going on a five-week camping trip to Mexico. University President Glenn A. Olds was asked to make a contribution from his office to a new program offered for the benefit of students at Kent State. It would have the largest enrollment of any summer course in the biological sciences. Parents, including many alumni—potential donors—were enthusiastic about the program, and local newspapers were going to give the trip and its supporters a good deal of publicity (the magic word; see Fig. 12). Olds was known at the time for announcing that any faculty promotion would be countered with a faculty demotion, budgets for academic programs would stay the same or decrease, fees and tuition would go up—and then accepted a large salary increase for himself. The average rate of inflation between 1964 and 1974 was 5.2%, and in none of these years did salaries or academic budgets keep up with inflation, resulting in a real decrease of more than 20% over the decade. The board of trustees announced with great fanfare that another university president would receive no salary increase but failed to mention it had voted to pick up the entire benefits package, amounting to over 20% of compensation. This kind of dishonesty and judgmental ineptness was one of several factors that brought collective bargaining to Kent State University. Olds was under siege and

Mexico provides fascinating study material for KSU students

By JOE HANNIBAL

"It was unlike anything I've ever seen before in my life," said Connie McPherson of 1702 Woodway Dr.

She was describing the tropical rain forest, only one of many fascinating and diverse environments she visited as part of a recent biological field trip to Mexico.

"There was so much to see," she said, describing the sandy deserts of northern Mexico, the glacier on top of Mr. Popocatepetl, and the cultural wonders of Mexico City.

McPherson and 34 other students also observed the Padre Island National Seashore in Texas, now in the news because it is threatened by a huge oil spill.

Kent State biologist Alan Graham, of 5661 Caranor Dr., led the group through the cities, tundra, deserts, and forests. Among other teacher-participants was Kent Environmental Council chairman and KSU biologist Benjamin Foote of 492 Harvey Ave.

Graham said the purpose of the trip was to provide students with an opportunity to see cultures and environments not represented in the Midwest.

The tropical rain forest was one of the favorite stops on the trip. Graham said it "is the most diverse assemblage of plants and animals anywhere in the world."

He said there were more species (kinds of plants and animals) in "just a few square miles of a tropical rain forest than in the entire Midwestern United States."

Graham said there were toucans, parrots, monkeys, and "just a whole host of organisms" including trees that were regularly 200 to 300 feet high and unusually large insects.

The group also studied the archeology of Mexico. They visited the ancient ruins of Teotihuacan, north of Mexico City, climbing the famous Pyramid of the Sun. They also saw remnants of the Aztec city of Tenochtitlan, which became Mexico City after the Spanish conquest.

They traveled south of Mexico City to view the Mayan ruins at Palenque, built between the seventh and 10th centuries AD.

The biologists also observed modern urban environments. Graham said the present Mexico City is one of the largest cities in the world, also "one of the most highly polluted."

The group sampled the city's cultural attractions, including the world-renowned Museum of Anthropology and the Ballet Folklorico.

Biologist Graham has been interested in Mexico for a long time and has written on prehistoric Mexican plant life.

"My interest in Mexico has been on the history and evolution of the vegetation and climate," he said. "This is determined by study of fossil pollen and spores from various geologic formations."

He has concentrated his attention on 16-million-year-old Miocene formations of southeastern coastal Mexico.

How much did this trip, led by experts and lasting about a month long, cost the students? Only $487 each, "a cost roughly comparable to what they would have to pay on campus," Graham says.

USING AN elephant ear leaf as an umbrella in a tropical rainforest in Mexico is Susan Whittier of Kent.

FIGURE 12. Article from the *Daily Kent Stater*, 15 August 1979, representative of the press coverage for Biological Field Studies in Mexico.

open to any prospect for improving his image, so the timing of the request for the field studies course was favorable. The hierarchy of the requests was also important because when the dean was told the president was supporting the program, he fell into line, and when the chairman was told that the dean and the president were supporters, what could he say? In turn, the department, college, and university all benefited from large classes in Summer Session I because the basis for determining state subsidy was Fall and Summer Session I enrollment. The project was presented to the administration as an "experimental" course. Although that only meant we had never done it before, it allowed us to request that no tuition be charged the first few times it was offered. Rather, the students were signed up for course overloads in the preceding spring semester. The bottom line from all the donations, discounts, finagling, and university support was that each student received eight hours of upper division or graduate-level credit, including tuition, food, lodging, and 7,000 miles of transportation for five weeks for $175 (see Table 2).

There were other financial items of little real importance, but symbolically they loomed large. In the early 1970s the Mexican government borrowed much of the value of its newly discovered oil on the Campeche Platform at the going rate of $32/barrel. Oil prices fell to $28/barrel and below around the time the loan had to be repaid, and it was a fiscal disaster for the country. The ramification of these international monetary manipulations for Biological Field Studies in Mexico was that as students lined up to exchange U.S. dollars for Mexican currency at the bank in Laredo, the peso was falling so fast that those at the end of the line were getting more pesos than those at the front. The exchange rate was written on a blackboard behind the teller and erased every several minutes to reflect the falling value. The sums being exchanged were around USD $20, but when magnified to 250 or so pesos it seemed like more. To keep the peace, those at the front of the line losing out in this frenzy of international finance were compensated from the slush fund otherwise known as the few dollars and change in my pocket.

There were other sources of peso rebates. A much better rate could be obtained from entrepreneurs on the street or from the Cambio (exchange) stores on the Mexican side of the border. Patronizing these quasi-legal sources required some wariness in that, while Mexican citizens would not likely be challenged by the authorities, foreigners could be harassed for a few hundred pesos for engaging in this technically illegal currency exchange. In these and similar situations, the options would be either to pay the fine or be taken to the station and wait for a few hours to discuss the matter, with passports confiscated for "verification" and vehicles with supplies and belongings impounded, until the official in charge returned at

some unspecified time and then pay an even bigger fine. With 45 people and a hundred pounds of melting ice to consider, it would have been prudent to pay. For individuals the risk was not great, but groups that were not part of the lucrative American Express or Greyline tours were more vulnerable. Each situation had to be assessed separately—including paying the standard 200 peso "gratuity" (USD $16) to move through customs or just sitting; and paying an occasional traffic fine for "speeding" through gridlocked Mexico City, or having the vehicles impounded. In the case of the Cambio offices, it was likely officials were receiving part of the money, so the chances of harassment were not great, and a few more pesos could be gained through the exchange for the slush fund. Tour leaders would also be

TABLE 2. Biological Field Studies Summer Sessions in Mexico and the American West, 1974–1985: Monies Generated to Kent State University (1974–1985 Dollars)

		Transportation	
Year	Tuition Generated ($)	Vehicles	$ Paid to Motor Pool
1974	—*	5†	3,500
1975	5,850	5	7,500
1976	4,800	5	8,500
1977	6,800	4	6,800
1979	6,075	4	7,200
1981	7,599	3	5,700
1982	5,340	2	4,000
1983	6,474	—	—
1984	11,124	3	6,600
1985	6,562	2	4,600
Total	60,624	35	54,400
Total generated to the university	115,024		

* Participants signed up for course overloads in spring semester.
† 3 vans, 1 personal van, 1 private car.

given gifts or a few hundred pesos for bringing groups into artisan shops. The gifts of pottery, onyx bookends, small rugs, ponchos, and serapes were given to students who could not afford them, and any money received was redistributed among the buyers. It was all symbolic, but efforts at "working the system" were appreciated, and it added to the spirit of the trip.

Mind Games

Altogether about 350 people went on the 10 trips between 1974 and 1985, and although most were from Kent State, others came from across the country in response to advertisements placed in *BioScience*. A concern was that there was no way to know how each person would react to being in such close quarters with so many people for five weeks. Conditions were often uncomfortable and unpredictable, and many students were away from home in a foreign culture for the first time, experiencing different food, language, currency, landscape, weather, and attitudes. The first rest stop at a Pemex gas station certainly carried a cultural shock of considerable impact. Several asked why there were stacks of newspapers and magazines on the restroom floor, and they were appalled at the answer. Another slammed the stall door too hard and it stuck. She had to slide out under the door on the floor on her back. She came out covered with overflow and smelling like an outhouse. Reminiscent of Uncle Pierre's comments at the family reunion, she and others around her kept saying "Jesus" until we reached camp.

The Pemex stations at the time were places that required several kinds of caution. At one stop the attendant told the driver the cost was 1,200 pesos, which was indeed the amount registered on the pump. The problem was he was not the attendant, and when the real one came up for the money there was a near-altercation between him and our outraged (viz., embarrassed) student, who was reminded of the incident for days to come—"just hand the damn money to anyone." Variations on the scam were that the bogus employee was a relative of the owner hired to increase the station's profit margin, or, unless the driver stood by the tank, the first few gallons would be pumped into a bucket for friends. It was all relatively harmless and even humorous during the earlier days of the 1970s when there was greater honor among thieves. I had my pocket picked in Mexico City and knew to go to the American Embassy to get the wallet back. After removing the cash the tradition was to toss the billfold over the wall of the embassy during the night so personal documents could be retrieved. But toward the end of the trips, the harassment, costs, and potential consequences were becoming more serious.

For the most part, our welcome in Mexico was friendly, and conditions were

easy to adjust to after a few days. The student composition in each van was kept the same to provide some sense of stability, unless there was a request for a change, and students with easygoing personalities were scattered through the vans to further diffuse any tensions that might arise. Faculty rotated among the vans each day to allow opportunity for discussing various subjects (botany, geology, geography, archaeology, entomology, ornithology). Some fear of the unknown was eased when the daily itinerary, a list of study sites (e.g., the Chihuahuan Desert in northern Mexico, the Universidad Nacional Autónoma de México [UNAM]'s tropical biological station at Catemaco, Toltec ruins at Tula) and cultural activities (performance of the Ballet Folklórico in Mexico City), and grading procedures were provided at the time of enrollment or at the first orientation session. The grading procedure was relatively simple and was based on cooperation, behavior, and participation; short quizzes, if needed, about lecture material presented in the evening at the camp in preparation for the next day's activities; and a notebook consisting of lecture notes, field observations, and abstracts of about 30 papers read before or during the trip. Many of these notebooks were grand productions with elaborate drawings, maps, color photographs, and insightful observations. Grades were mostly As and Bs for the two separate courses of four-hours credit, and there were very few grades of C or below because for the most part performance was exemplary. Everyone expected adjustments to be made in the course along the way, but they were reassured that thought had gone into organizing the trip and that plans had been made for contingencies.

Parents especially seemed more at ease once they perceived the highly structured nature of the course. Under the assumption that transparency works best, everyone was informed in the preceding spring semester orientation that no one was expected to permanently alter their personality, but only to blunt the sharp edges and to be tolerant of others for five weeks. Also, they were advised that where improvement was needed they would be so informed, and if their actions became disruptive they would be told to leave—mostly an empty threat, but there was a feeling it could happen. There were no serious disciplinary problems, in part because the ground rules were clearly defined and because restraints were provided by peers. Any indifference to the success of the trip and to the welfare of others would have stood out sharply and probably dealt with internally. One participant stated at the orientation that anyone can "hold off" for 30 days, and that was helpful. Nonetheless, a few instances did arise that required special handling.

A motivation for teaching is when success is achieved in a particularly difficult case. A faculty member in psychology at Kent called to say that one of

our participants was receiving counseling. The problem was not directly genetic or biochemical but, rather, a deeply negative self-image stemming from early personalizing experiences and poor social skills. The counselor felt that if the student could succeed in the course it would be a great confidence builder, but there were risks. The student had expressed the opinion that, at least in theory, suicide might be an option for some people if it were the only way out. She spoke haltingly and rarely established eye contact. It had obviously taken great courage to even contemplate going on the trip, and it seemed likely that after making an initial effort she would not go and another strand of failure would be added to an already weakened fabric. She had not declared a major, she lived alone, spent most of her time immersed in books, and consequently was very familiar with English literature and had a very high grade point average. We talked about our mutual interest in books and music, her extensive knowledge of classic literature, and finally eased into a discussion of the trip. We joked about our both liking food, and she said that to save money she prepared all her own meals. I told her that could be of great help and asked if she would be willing to advise us on shopping and meal preparations. Although she came in a few more times, it was uncertain whether she would really show up, but she did. Some of the stalwarts of the trip invited her to help plan the menus and go on the first shopping trip. On the day of departure no one was there to see her off, and she was clearly anxious. It seemed she might still back out, but she didn't. I had placed a copy of Oscar Lewis's 1961 classic *The Children of Sanchez* in her van, and she sat in the back reading for most of the day. Slowly she began to take part, then about half way through the trip a noticeable change began to take place. She started to laugh more and join in optional activities. She revealed to some of the girls she had been in counseling, and was told it was no big deal because once the whole school was nearly declared a mental institution. The contacts continued after the course, and her vitalizing transfiguration was a most rewarding experience.

Another student had been in prison for armed robbery, but it was clear that this episode reflected pressures growing up in a neighborhood without even the limited choices of a Sixth Ward. He completed the trip with distinction and went on to get a master's degree in biology. His peers who knew of his background helped push the incident into irrelevancy by asking him why every time we went into a bank to change money he came out with more than anyone else.

A related revelation about the group was how important some minimal level of parental attention is during the early formative years. A deficiency in support and attention can take various forms, even into adult life, and potentially lead to the blackbird syndrome. In addition to the student mentioned as having trouble with indifferent parents and authority figures, after the trip was under way one

swaggering fellow told everyone he had been in prison for murder. This particular draping of the mantle didn't have the desired effect, and when he was given manly tasks like changing oil filters and cleaning sparkplugs, he backed off from the claim. Perhaps today he is an avid user of Armor All and WD-40, lifts weights, gets tattoos, and drives dark-windowed vehicles with names like "Renegade" and skull-ornamented bumper stickers reading "an army of one"—passing fads that for some, like the Walter Mittys of the Texas dormitory, never quite seem to pass. These types of mild behavior characteristics—lack of confidence, resentment of authority figures, exaggerated claims of accomplishments, and need for attention—were manifested by complaining, bragging, or excessive talking, but overall they were rare and countered by the exuberance of the other participants. They could not be effectively addressed within the time or under the conditions of the trip, so they were just monitored and tolerated.

The group coalesced into a remarkably efficient and spirited caravan in a very short time. Those in each van who felt comfortable with the responsibility were designated as drivers. Some joined in later as drivers, while others moved to different tasks, so this critical function was soon being carried out by a very capable group. Each trip was about 7,000 miles long, and with an average of four vehicles for 10 trips, this meant about 280,000 miles were traveled with only a single incident and without injuries (see below).

Two or three people in each van served as cooking and shopping coordinators, some rotated as clean up crews, and others contributed as talents permitted. The students were ultimately responsible for over 4,000 meals, prepared after long days of travel, using camp stoves, ice chests, and halazone-laced drinking water. These duties were followed in the evening by reading, lectures, studying, or revising notes. Students rigged up oven-like contraptions to bake cakes, made 'blueberry' pancakes from *Myrtillocactus* berries, and overall the food was innovative and excellent. A picturesque but marginally successful culinary achievement at Yellowstone was to use cow pads for fuel like the pioneers had done. One participant observed that is probably why there are none of them left. There were two packers for each van to make sure everything fitted in safe and secure, and two others cleaned and organized the vans every four or five days—an important task considering how quickly things could become chaotic and, consequently, people could become testy.

Most early mornings there were groups of local children gathered around the camp site to watch the activities. One of our students asked another how to say "tarantula" in Spanish. Never to miss an opportunity, he was told "*hermana*," and the children had a momentarily confusing but ultimately hilarious moment when told, "I will give you a peso if you will bring me your sister."

It was essential to have someone from Mexico with us on the Mexican part of the trip to assist with the language and to negotiate us out of "incidents." Rosa Pedraza was a bright and vivacious student from UNAM who accompanied us on the 1979 trip and performed yeoman service. On the way out of Mexico City a young Mexican policeman saw the four vans as an opportunity to pick up a few pesos and told us we were driving too close to the curb. I told him to go to the next van where someone spoke Spanish. Rosa lit into him with force and fury. She admonished him for embarrassing his country before visitors and disgracing his family and the memory of his mother. By the time she was finished we almost felt sorry for the young man, and he seemed quite willing to try easier prey. Alfonso Delgado was another student from Mexico who went with us in 1974 and 1975. He later received his Ph.D. in botany from the University of Texas and is now a recognized authority on the Fabaceae (legumes) at UNAM. On that same trip there was a field collector named Ismael who amazed everyone with his ability to scamper up gigantic smooth-barked trees. He was later employed by UNAM, and many important discoveries are based on his collections. Dr. Andrew Vovides from the Instituto Nacional de Investigaciones sobre Recursos Bióticos in Jalapa is a specialist in cycads, and he came in 1976 and 1977. In 1983 we were joined by students Jose Luis Alvarado and Monica Ayala-Nieta, who interacted with our students interested in practicing Spanish and learning about Mexican history, culture, and life at UNAM, a university with 500,000 students and a teaching staff of 25,000.

Faculty

Three faculty served as permanent staff for the course—Benjamin Foote, entomology and invertebrate zoology; David Waller, ornithology and vertebrate zoology, ecology, animal behavior, and mercifully knowledgeable about the rudiments of group psychology; and myself in botany, geology, archaeology, and Mexican history. We also provided a spectrum of personalities with whom each student could comfortably identify. Foote was friendly, patient, understanding, and willing to listen sympathetically to problems. Waller focused on course content, monitored personalities and interactions, and presented an air that not much was getting past him. I assumed the façade of a benevolent disciplinarian who would lower the hammer without too much provocation.

A major contribution was made to the course by colleagues in Mexico who joined us at the various camp sites for lectures and field trips. Dr. Jerzy Rzedowski was a renowned botanist at the Escuela Nacional de Ciencias Biológicas of the Instituto Politécnico Nacional in Mexico City and he came to San Luis Potosí to talk about the vegetation of Mexico. In other years Dr. Fernando Medellin

L. of the Universidad de San Luis Potosí lectured on arid land ecology. These talks were particularly valuable because one purpose of the trip was to contrast the composition, adaptations, and processes operating in two environments unfamiliar to students from the Midwest—the desert and the tropical rain forest. The desert was convenient for introducing the idea of species and for discussing the evolutionary importance of hybridization, through the readily observable Joshua tree *Yucca*. One species has large, upright, unbranched inflorescences, another species has drooping branched inflorescences, and the hybrids have a combination of each. A species of *Yucca* is known in the lighter literature of science as the schuss-yucca (*schuss* is the German word for "shot"). The inflorescence is said to unexpectedly shoot up with such suddenness that once it impaled a conquistador and his horse jumping over it at the time of flowering. Although an attempt was made to document the schuss-yucca (Albrecht, 1952),[18] the authenticity of the photograph has been questioned because the model's shadow suggests that the Earth would have been rotating at a dizzying pace during the nanoseconds of flowering (see the arrows in Fig. 13). A real plant that gives a distinctive appearance to the dry vegetation of Baja California, Mexico, is *Idria columnaris* (*cirio*; taper or candle in Spanish). It grows in a wide variety of bizarre shapes and reaches 24 m (76 feet) in height (Fig. 14). It is called the "boojum," a name taken from Lewis Carroll's poem "The Hunting of the Snark," in which the boojum is described as a strange mythical

FIGURE 13. The schuss-yucca "caught" in the act of explosive flowering. Note the unexplained lengthening of the model's shadow (arrows) during the split second of flowering. Photographs from Albrecht (1952).

FIGURE 14. The boojum (*Idria columnaris*), Baja California, Mexico. The branching is due to damage of the stem apex. Photograph from Humphrey (1974).

FIGURE 15. Peyote (*Lophophora williamsii*), Nuevo Leon, Mexico.

thing found in exotic regions. The peyote cactus (Fig. 15), formidable-looking whip scorpions (Fig. 16), horned toads (Fig. 17), and tarantulas (Fig. 18) added to the intrigue of the desert ecosystem.

Marcus Winter is an archaeologist who lectured to our group during visits to the Zapotec sites at Mitla and Monte Alban in Oaxaca (Winter, 1992). Dr. Alan Phillips was a pleasantly eccentric, no-nonsense ornithologist who had us in the field outside Monterrey at 5:30 A.M. to seek shivering birds concealed in obscurity in the bushes. Two hours of waiting provoked further salvational utterances of "Jesus." It was becoming quite a religious group. In the tropical rain forest at Catemaco in Veracruz howler monkeys, toucans, parrots, bats, tree ferns, and tree-size bamboo grasses, orchids, strangler figs, leaves one could stand under, and the unimagined biodiversity also made an impression. They offered opportunity to observe adaptation in lianas, cryptic coloration in moths and lizards, mimicry in butterflies, and the coevolution of ants and *Acacia*, which had been read about in the assigned pretrip readings. Climbing the volcano Popocatépetl to the edge of permanent snow, and going into a bat cave furnished with candles, rosaries, coins, and written notes seeking protection from evil spirits generated wide discussion and were instructive, each in their own way.

Some students went on several trips, and as peers they provided reassurance

FIGURE 16. Whip scorpion, San Luis Potosí, Mexico, 1976.

FIGURE 17. Horned toad, Nuevo Leon, Mexico, 1979.

FIGURE 18. Tarantula, San Luis Potosí, Mexico, 1974.

and valuable insights for first-time participants. Barney Dunning of the University of Arizona had gone on the 1976 and 1979 trips and returned as an assistant in 1982, and Karen Hummel of the University of Arizona went on the 1975 trip and also returned in 1982. Others were Tom Arsuffi, Wayne Zipperer, and James Smolka. Several students later went on for master's, Ph.D., M.D., or D.V.M. degrees (see the Appendix). Guest faculty also provided information on additional fields of study. Orrin Shane, professor of archaeology, and Vincent Gallicchio, professor of parasitology, both at Kent State, and Judy and David Hopkinson, biology teachers from Pennsylvania, came in 1974, and all contributed in important ways.

There were also other guest faculty. For obvious reasons rules of the trip included no smoking in the vans, no hard liquor, and safe operation of the vehicles. On one trip, even before leaving the parking lot, one guest teacher was filling the van with smoke, and it was a situation that had to be addressed. It also offered the opportunity to show students that there were rules, many of which they themselves had formulated, and that they were going to be followed. Making sure everyone could hear, he was told to get out and remove his belongings from the van. Benjamin Foote intervened, an apology was offered, and that was that. Except it wasn't, because the first night in Mexico the same person bought a fifth of tequila and convinced a few students to have a drink. There was a more intense confrontation, and those who had participated were reminded that an F/F for eight hours of credit would loom large on a graduate transcript. It was further evidence that inane behavior and the need for attention can extend into adulthood and override good judgment. Another guest faculty took one of the vans on a harrowing 80 mph race around a congested turnpike. Perhaps the low came when three livid undergraduates complained that a guest faculty was hitting on them. It was a different time nearly 35 years ago, and such advances were not as commonplace or tolerated as they are today, and it had the potential of ruining the trip in many ways, including legally. I mentioned in an evening lecture that some of our female members had been harassed and that we should be on the lookout for the culprit. Everyone assumed it was someone from the outside, and our pseudomurderer offered vivid descriptions of what he would do if he ever got his hands on the randy bastard. No further advances were made. It was eye opening that the three most juvenile and potentially harmful acts toward students in the 12 years of the trip were from guest faculty—blackbirds with doctorates.

Mishaps

Something that lends excitement to an adventure is the subliminal feeling of potential danger—as long as the danger is not too serious and everything works out well. At Palo Duro Canyon in Texas in 1985 we took reprieve from setting up

tents every night and slept on the ground. Kimberly Ruff was stung by a velvet ant and had a gruesome-looking eyelid for a few days, and Joseph Deranek was taken to the hospital for what turned out to be some vicious stings by fire ants. His colleagues told him it looked like syphilis and that he would probably have to ingest mercury, even though it didn't help Oscar Wilde, who died of the disease. Later another student picked up a small snake that turned out to be an immature rattler and got nipped. She was given a dose of saline solution at the local clinic and observed for an hour, during which time she was regaled with stories about rattlesnake bites: Two prospectors were panning for gold when one got bit on the butt by a rattlesnake. He pleaded for his companion to go into town for a doctor. The doctor told him that to save his friend's life he would have to make slits through the two bites, put his mouth over the holes in his ass, and suck out the deadly poison. When he got back to the camp his friend asked him, "What did the doctor say?" "In so many words, he said you are going to die."

In the rain forest a huge black scorpion over five inches in length with formidable pinchers and a terrifying-looking stinger got rolled up in Roberta McMillan's sleeping bag, and the next night at Palenque it gave her a painful sting. We spent the night looking for a clinic where she was given the universal treatment of saline solution and an hour of observation. Like so many awesome-looking insects, size and appearance was its principal defense, and it was relatively harmless. On the 1977 trip Audry Wanstreet got a bad case of stomach flu, so we stopped at a hospital in Brownsville. They gave her something that restored her spirits beyond our wildest dreams and she laughed and giggled for the rest of the day. In 1979 the Gray Line tour bus did not show up at the Cabello Trailer Park and we had to improvise a tour of Mexico City on the spot for 40 people, and so it went.

There were minor vehicular problems. One van kept stalling, but half the people in the trailer park seemed to know how to adjust carburetors—we probably had several in Lynne Herold's van. A gas station in a rural part of Mexico was out of fuel except for some they kept in a barrel in the back for local farmers. A student used his T-shirt to filter out the rust, then claimed he should be reimbursed for supplying parts. He was told the shirt smelled about the same before and after filtering the gasoline, the perspiration was so strong it was fouling up the fuel gauge, and he would be billed for damages.

The most serious accident was in 1975 when, despite heroic efforts by driver Donna Lisiecki, the van ran up and over a huge boulder washed onto the highway during a thunderstorm at night in the mountains of Oaxaca. It virtually cleaned out the underside of the van, including the brake line, and it was a potentially dangerous situation. A spare tire was tied to the rear of one van, another to

the front of the damaged one, and the two vans were cinched together with a towing chain. We limped along at 10–15 mph for the rest of the night, arriving in Oaxaca City the next day. There were no garages able to repair such extensive damages, so arrangements were made to tow the van to Mexico City. Three days later it had not arrived, and we were still trying to push paperwork through the government and insurance bureaucracies. The biggest obstacle was that upon entering Mexico five visas were stamped "*con automóvil*" and five vehicles had to be taken out of Mexico. A common practice of the day was to bring used cars from the United States, sell them in Mexico, and take the bus back for another car. Hence, the government office would not sign a release until the insurance company signed a form saying they had possession of the van. It was costing nearly $300 a day for food, lodging at the Cabello Trailer Park in Mexico City and to keep everyone entertained. Finally, the adjuster at the insurance company took pity on us on the fourth day and signed the document saying they had the van when it probably was still on its way from Oaxaca. There was even a chance we might never see the vehicle again and that the passionately attentive director of the motor pool at Kent State would have to be told that one of his precious vans was probably being sold piecemeal across Mexico. It recalled bringing my sadly rearranged M1 rifle to the regular army sergeant at Texas. But the van finally did arrive in Mexico City, and Shirley and I flew down and drove it back to Kent. By that time it had a hand-fashioned U-joint, a cast iron exhaust system, tie rods salvaged from a semitruck, and other parts admired by Kent motor pool personnel as monuments to the abilities and mechanical ingenuity of their Mexican colleagues. During all the anxious days in Mexico, Benjamin Foote stayed with the group, and David Waller was a calming force on the endless visits to the insurance and government agencies. All the belongings, equipment, supplies, 10 students and their purchases (onyx tables, candelabras, chess sets, pottery, and three tarantulas in the bottom of a cereal box) from the damaged van were crammed into the other vans, and we were on our way home. An unexpected piece of hazardous cargo was a sliver of peyote cactus a student was going to bring through customs, for teaching purposes, prompting my own supplications of "Jesus."

During these five-week ventures it was essential to provide some diversion. We were usually up at 5:30 A.M. and not in bed until around midnight, so after several days breaks were in order. In Mexico City these were easy to arrange because of all the exceptional activities available. Among these were visits to the Museo Nacional de Antropología, which has the Aztec Calendar; the Universidad Nacional Autónoma de México and its impressive library building covered with exterior murals; the Municipal Palace; the Shrine of Guadalupe with the

supposed image of the Virgin Mary that appeared on Juan Diego's sisal cloak on 9 December 1531; the National Cathedral; the Chapultepec Castle; the Plaza de Las Tres Culturas; trips to the top of the Torre Latinoamericana ("El Torre"), with both inspiring and depressing vistas of a city with 14 million people; the San Juan Market, with its native foods and folk remedies, and elegant meals at the Manua Loa and at Sanborn's House of Tiles (originally built in 1596); and a spectacular performance of the Ballet Folklorico. There were onyx and tile factories in Puebla, stops for the elegant black pottery and evenings spent on the beautiful plaza in Oaxaca City, and the exquisite all-wool, natural dyed, hand-made rugs in San Juan Teotihuacán. These ranked right up there with the Anheuser-Busch Clydesdales and the Dalmatian dog in the students' lists of memorable experiences.

Biological Field Studies in the American West

We started similar trips to the western United States when things began getting expensive and more difficult for camping in Mexico. The first version was offered in 1982 focusing on the western and southwestern United States. In 1983 it was back to Mexico, in 1984 to the Pacific Northwest and Canada, and the last trip in 1985 was a combined version to the southwestern United States and northern Mexico as far as Mexico City. These were less challenging to organize, and they provided a more relaxing survey of the equally impressive geology and the biota of a fascinating part of North America. Campsites in state parks and the national forests were free, and in the national parks they averaged $5 per van for education groups. Safe drinking water, gasoline, laundromats, and clean restrooms were mercifully available everywhere. The principal stops were at Padre Island National Seashore, Big Bend National Park, Mammoth Caves, Carlsbad Caverns, and Wind Cave. Carlsbad provided the opportunity to talk about cave faunas and their modifications and about a new line of research just being developed. The growth rings in stalagmites are approximately annular, and their width reflects yearly precipitation through time. Further, they contain fossil mite and midge faunas that change in composition through time and also preserve a record of the paleoenvironment. As such, they are now used to study climate change, especially in arid regions where traditional fossils are scarce. We stopped briefly at the Alamo, where Mrs. Gibson's voice still rang remarkably clear about Davy Crockett, James Bowie, William Travis, and Santa Anna. Other study sites were at White Sands, Organ Pipe Cactus, Devils Tower, Dinosaur, and Sunset Crater National Monuments, Black Hills National Forest, Mount Rushmore, the Southwestern Research Station at Portal, Arizona, the Arizona-Sonora Desert Museum, Montezuma's Castle (cliff dwellers), Great Salt Lake, and Hoover Dam/Lake Mead National Recreation Area. National Parks included Badlands, Zion,

Bryce Canyon, Saguaro, Arches, Rocky Mountain, Sequoia, Redwoods, Lassen, Olympic Peninsula, North Cascades, Banff (Canada's oldest national park), Jasper, Glacier, Grand Teton, Yellowstone, and the Grand Canyon, where we hiked down the south rim, camped for the night, hiked up the north rim, and then stayed for a day at the Grand Canyon Lodge to recover. There were no accidents, injuries, or major incidents, and 12 years of these offerings to the students of Kent State University ended on a positive note. See Tables 2 and 3 for a summary of the income generated for the university and trip statistics. A list of the participants is given in the Appendix, and further illustrations are in Figures 19–25.

The trips ended while we were ahead because it was clear that things in Mexico and the personality of the student groups were changing. In Mexico most of the land along the major routes is now fenced, and access without permission is not advised. Also, some roads through isolated areas were becoming dangerous, with bogus barriers set up to divert travelers who were then robbed—prelude to the drug wars that now plague parts of both rural and urban Mexico. The earlier bribes and gratuities of a few hundred pesos were seriously increasing, and the financial penalties for extricating someone from the consequences of juvenile acts were becoming more substantial. The principal reason for discontinuing the

FIGURE 19. The beach at UNAM's Tropical Biological Station, Catemaco, Mexico, 1981.

FIGURE 20. Gay Haven Trailer Park, Laredo, Texas, 1977.

FIGURE 21. Hear no evil, see no evil, speak no evil, do no evil, Mitla, Mexico, 1974.

FIGURE 22. Boots and shoes, Meramec State Park, Missouri, 1982.

FIGURE 23. Bears and vacated camp, Banff National Park, Canada, 1984.

trips, however, was that the collective maturity, sense of responsibility, judgment, concern for the common welfare, and dedication to learning had declined, with notable exceptions, to the point that the endeavor was no longer as interesting, prudent, or worth the effort. This decline in the quality of some aspects of American education is discussed later (see Chapter 9). Suffice it to say here that the trend was becoming clear during the years between 1974 and 1985.

Legacy

It is interesting to follow what happened to some of the approximately 326 mostly undergraduate students from a relatively small university in the 1970s–1980s and

who mostly had not traveled beyond the Midwest. Some 30 students went on to pursue Ph.D., M.D., or D.V.M. degrees at schools such as the University of Arizona, University of California, Berkeley, Colorado State, Georgia, Michigan, Minnesota, Nevada, Ohio State, Purdue, Stanford, Syracuse, Washington, Texas, Toledo, Scripps (University of California, San Diego), Virginia Polytechnic Institute, and Wisconsin. Gary Barker (1975 trip) is director of safety and operational risk at the newly established Health, Safety, Security and Environmental Unit of the Global Projects Organization at BP. Lynne D. Herold, Ph.D. (1974 trip) has the high-profile, high-responsibility position of senior criminalist with the Los Angeles County Sheriff's Department, and Sherilyn Fritz, Ph.D. (1979 trip) is now

FIGURE 24. Last night in Mexico, Posada Del Rey, Zimapan, 1985.

FIGURE 25. End of the trip, Cunningham Hall (Biological Sciences Building), Kent State University, 1977.

the George Holmes University Professor of Earth and Atmospheric Sciences at the University of Nebraska, Lincoln. Others upon graduation were employed at Amoco, Beckman-Coulter, Case Western Reserve University, the U.S. Forest Service, and the Environmental Protection Agency. An unanticipated by-product was that the close quarters served for matchmaking like a cat on a hot canvas roof. Altogether, 18 people from the trips were partnered or married—Karen Dyer (1974) and Vincent Gallicchio (1974), Lynette Foote (1975, 1982, 1983) and Trevor Vidic (1981), Sherri Foote (1975, 1979, 1981) and Garry Homany (1981), Constance Marczak (1974) and Wayne Zipperer (1974, 1977), Lucy Perko (1975) and Craig Krieger (1977), Cindy Rebar (1975) and Tom Arsuffi (1974), Robin Smerling (1976) and Peter Dewolfe (1976), Janet Taylor (1979) and John Lehman (1979), and Joanne Vinopal (1975) and Robert Antibus (1974). Thirty-five years later a couple came up to me at the Botany 2009 Conference in Snowbird, Utah, and one of them said, "I'm Bob Antibus, this is my wife Joanne Vinopal, and we were on the 1974 Mexico trip." In 2011 Lynne Herold wrote, "I remember the [1974] trip like it was yesterday, probably because my time at Kent State was among the best and favorite years of my life," and Irvin Lutz remembers the "unique and unforgettable trip to Mexico" in 1981. We have the distinct honor—and a progeny of two participants from the 1979 trip has the awesome burden—of bearing the name Benjamin Graham Wireman. Letters from the

TABLE 3. Biological Field Studies Summer Sessions in Mexico and the American West, 1974–1985: Summary Statistics

Years of program	12
Total student enrollment	326
Total number of lecturers and accompanying persons	24
Total number of trips	10
Total number of vehicles	35
Average miles/trip	7,000
Total vehicles miles traveled	336,000
Total monies generated as tuition ($)	60,624
Total monies generated to the motor pool ($)	54,400
Total monies generated to the university ($)	115,024

archives abound in the sentiment that for many the trips were a "life-changing experience."

To the extent this is true, it is due in large part to the varied events and experiences that provided the motivation to offer the courses and that shaped the way they were done. To reiterate the varied sources of this motivation, it came from the Sixth Ward and its families in Houston; Dow Elementary School and especially its teachers; the tennis facilities fortuitously built almost adjacent to the school and the opportunities provided by the Houston Patron Tennis Association; Tabernacle Baptist Church and the Dutch Christian Reform Church in Ann Arbor for demonstrating zeal and the need to keep that zeal in perspective; Sam Houston High School and its teachers; the faculty of the University of Texas, especially Greek and Latin scholar cum tennis coach Daniel A. Penick and legendary naturalist Benjamin Carroll Tharp; the generosity of Exxon and the King Ranch; the fraternities, ROTC, and pharmacy and engineering programs at Texas for helping focus direction; the University of Michigan, its faculty, and the Choral Union and Extra Concert Series for expanding horizons; Harvard University and its faculty, even Timothy Leary, who along with the "rockers" of the 1960s showed the dangers of pseudointellectual babble that can come from both outside and from within the ivory tower; colleagues who provided early professional baptisms of fire; instructors like George Wald, George Beadle, and Melvin Calvin for showing that undergraduate teaching and world-class research are both possible; the American Association of University Professors (AAUP) faculty union at Kent State University (see Chapter 11) for elevating the quality of the institution sometimes against its own will; supporters who helped counter efforts to maintain the status quo by those faculty and administrators at Kent State fearful of change, challenge to authority, and the prospect of gender equality; and to Shirley for making the journey complete. Each event and experience contributed personalizing and professionalizing strands to the academic fabric that would affect research and teaching. An awareness of these strands can provide a check on how we react to social changes that affect education, and it can bring to the fore the need to adjust methods and attitudes to meet these changes.

Research, Fossils, and Religion

"A 100 Million Year Love Affair with American Plants"

Refuge: a haven or sanctuary providing relief from hardship.

Motels do not normally qualify as refugia in the strict sense of the word, but in the summer of 1961 the Loma Linda Motel on Highway 55 in Taxco, Mexico, was a sanctuary *Dei gratia*. In those days, casual visitors and professional field researchers alike were often introduced to the rigors of foreign travel by insidious little microbes like *Shigella sonnei* or *Entamoeba histolytica*. One causes bacterial and the other amoebic dysentery. For being so small, they carry a three- to five-day biological punch of astonishing effect, and amoebic dysentery can be reoccurring. To counter memories of the experience, the condition is given whimsical little names like "Montezuma's Revenge" or "the trots." There is debate among the initiated as to whether one eventually acquires some level of immunity, if a subliminal, survival-of-the-fittest evolutionary instinct develops for

avoiding the most obvious sources (contaminated water and bad food), or if it is all just luck. Either way, for those who travel widely, or spend time in the field, the trots are often a memorable part of the adventure, particularly in the tropics of Latin America. Early on, I spent a measurable part of this time in the Loma Lindas of the world waiting for *Shigella* and *Entamoeba* to run their course.

Of the varied components of professional life in higher education, research is the most difficult to sustain over a long period. Accurate figures are difficult to find, but the impression is that the majority of those with a Ph.D. are not publishing 8 to 10 years after receiving the degree. Among the many factors involved are that the traits of the individual did not match the requirements of the task; long-term projects were not developed to supplant graduate research; publications at the place of employment were not expected, as in most industries; research at many smaller universities is difficult because teaching loads are heavy and research is not supported or considered essential for advancement; and eventually grants are not forthcoming. The possibility of being employed at a small university, at least for a time, before receiving "the call" to a major university needs to be anticipated by new graduates. It has been shown repeatedly that with efficiency in teaching and selectivity in service and administration, research for a while can be carried out almost anywhere. Furthermore, the individual and the project usually become more valued when overhead from grants and patents begin flowing into the university coffers.

The advice from mentors about research I found especially valuable was to hit the ground running, and one component of a fast start is to get the dissertation published promptly. Today the procedure is different in that parts are often published along the way, and these manuscripts are then bound together to constitute the dissertation. Either way, prompt publication is sound advice because it establishes priority in fields defined in graduate school, it identifies the individual to the granting agencies as a serious player in the highly competitive arena of modern research, and it documents the potential for research and productivity when applying for grants. Also, it is difficult to anticipate how much time it will take to develop and sustain quality courses, but the bulk of the effort should be completed in the first year and subsequently limited to revisions and updates. Good teaching is important, among other reasons, because student evaluations are used in deciding promotion and tenure. But for some new faculty, it is tempting to become overly involved in their first solo teaching experience to the detriment of other tasks. However, in these cases it is likely that teaching was the individual's first interest, rather than establishing a balanced program of teaching and research.

Grants are often the last of the service-administration-teaching-research endeavors to be completed because research has become so complicated, large-scale, competitive, and expensive that it usually requires multiple applications involving several investigators often from institutions in different parts of the world. Even so, satisfactory teaching, research, and extramural funding are usually established in the first two or three years of a career, or not at all. It is a challenging time for new faculty, and early results have long-term career implications.

Just as it is difficult to predict what personalizing effect a deed or utterance will have on a person in his or her formative years, it is equally difficult to predict what professionalizing effect some early observations will have on long-term research interests. The Succor Creek fossil flora of southeastern Oregon, the subject of my Ph.D. dissertation (Graham, 1963, 1965), contained thousands of specimens of oak, elm, birch, maple and other taxa that have affinities with present-day temperate regions of eastern North America, but only one holdover from former tropical times, *Oreopanax* (Fig. 26). Among the hundreds of lectures I heard at Michigan on a multitude of subjects, it was the nonsequitur about environmental change generating biological diversity, the tropics being the most diverse of all ecosystems, and the tropical environments being stable and unchanging that had a lasting impact. My curiosity was further raised when a search through the geological and biological literature revealed that virtually nothing was known about the ancient environments of the tropics—how did we know they were stable and unchanging? Considering that two-thirds of everything that lives, lives in the tropics, it seemed like a question that deserved an answer. The means for investigating the topic was provided by studying biology and geology at Texas and Michigan, the motive was supplied by the anomalous *Oreopanax* and the unsubstantiated proclamations about tropical ecosystems being stable, and the opportunity was presented with the call from Harvard to study fossil plants from Panama. The result was that I spent the next 50 years investigating New World ecosystems, how they got that way, and what their history can tell us about where we might be heading. The technical results have been published elsewhere (e.g., Graham, 1999, 2010b, 2011), so only a summary is presented here, along with some experiences in gathering the data for this third responsibility (after service-administration, and teaching) when working in higher education.

Briefly, ecosystems are the large units of plants, animals, climates, and physical features like soils, slope, exposure, and topography that define subdivisions of the Earth's surface (e.g., tundra, boreal forest [Economist, 14 May 2011a], deciduous forest, desert, grassland, tropical rain forest). These ecosystems are the products of millions of years of evolution, and my research involves trying to

FIGURE 26. ***Oreopanax*** **leaf, 15 million years old, Succor Creek, Oregon.**

determine their origin and their changing composition and distribution through geologic time. Modern ecosystems are the afterlife of ancient floras, faunas, and the environments in which they lived—a complex global system of interacting components. Even though it is a daunting task, considering the complexity of the Earth's biota and its interactions with the physical environment when extended over millions of years, there is an impressive array of techniques available for the undertaking. It is possible to reconstruct the history of carbon dioxide, methane, and other atmospheric greenhouse gases from estimates of the amounts of carbonate rocks over time to determining the composition of gases trapped in air bubbles in glacial ice. The varying amounts of heat reaching the Earth's surface from the sun through time can also be calculated. These are called Milankovitch variations, and they arise from alterations in the shape of the Earth's orbit around the sun from elliptical to nearly circular (the eccentricity variation), changes in the orientation of the polar axes (presently 23.5° from the vertical; the tilt variation), and a nearly imperceptible unsteadiness in the spinning of the Earth as it slows down (precession). These changes are patterned, and the eccentricity variation, for example, occurs on a cycle of 100,000 years.

The paleotemperature of the Earth can be determined by measuring the relative amounts of isotopes of oxygen in cores taken from the ocean basins and through glacial ice. Oxygen has two forms, ^{16}O and ^{18}O, both are present in ocean waters, and both are incorporated into the silicate (SiO_2) and carbonate

($CaCO_3$) shells of marine organisms. However, more ^{18}O is taken up as the water cools. Thus, by measuring the isotopic content of shells in a core through marine sediments, or in air bubbles along an ice core, it is possible to determine the temperature changes of the water through time and extrapolate these patterns onto the adjacent land through paleontological and other studies of terrestrial habitats. Other techniques include dendrochronology (tree ring analysis), changing composition in the plant debris of packrat middens (nests), varying widths in the layers of stalactites (reflecting precipitation in the region over the years), the amount of dust in layers of glacial ice (revealing intervals of dryness), changing density in the stomata (pores) on fossil leaves through time (fewer stomata correlate with increasing CO_2 in the atmosphere), percent representation in fossil floras of entire-margined leaves (most common in tropical environments) versus lobate ones (temperate or seasonal environments), fluctuations in sea level shown by patterns of erosion (meaning exposed coastlines) and deposition (meaning flooded coastlines), and many other devices.

Among the several worthwhile consequences of these studies, three may be cited as examples. First, it tells us something of the environments under which we evolved and of which we are presently a part, namely, it satisfies an intellectual curiosity that is a unique part of the human spirit. Second, past climatic conditions can serve as analogs of what to expect in the future as the environment changes through natural processes and from human activities. It is known that just before the beginning of the Industrial Revolution in the early 1800s the level of atmospheric CO_2 was about 300 parts per million by volume (ppmv). Currently it is 380 ppmv, at present rates it will increase to 550 ppmv by mid-century, and to 1,000 ppmv by the end of the century. Each doubling of CO_2 concentration causes a rise in mean annual temperature (MAT) minimally of about +0.5°C. A rise in MAT of 0.5°C produces notable changes in climate and ecosystems, and there were times only a few thousand to several hundred years ago when temperatures warmed by 12°–14°C. In the early Eocene 55 million years ago, CO_2 concentration was 2,000 ppmv and tropical conditions extended to the Arctic Circle. Toward the end of the Pliocene around 2.6 million years ago it dropped to less than 200 ppmv, and glaciers covered much of the Earth. The period between about 850 and 1300 C.E. is known as the Little Ice Age, and the eruption of Tambora Volcano in Indonesia in 1815 inserted so much debris in the atmosphere that it blocked sunlight, the temperature dropped, and 1816 became a "year without a summer." Compare that to the present trend in warmness, where we have years without a winter in many regions. It was in 1816 that Mary Shelley, confined indoors by the cold with her husband, the poet Percy Bysshe Shelley, George Gordon, Lord Byron, and others near Geneva, Switzerland, wrote

as a diversion *Frankenstein; or, The Modern Prometheus* (Shelley, 1818). In the novel, as opposed to the movie, cold and ice play prominent roles in both the opening and the closing chapters. The consensus among qualified observers without biased agendas is that atmospheric pollution and greenhouse gas emissions are increasing global warming (Gibbons, 2010; Gillis, 2011a), and if it continues unregulated, and without adequate preparation, it is dangerous. A Category 5 typhoon (the strongest measured) with winds in excess of 140 mph hit Queensland, Australia, for the first time in February 2011. Extreme weather in the Midwest United States in the summer of 2011 and along the east coast in November 2012 forced increased public awareness about high-cost weather and raised the possibility in the minds of many for the first time that global warming and climate change through human activity may be real (Fraser, 2012). In this decade, hurricanes have hit in the Atlantic as early as March, as late as December, and as far south as Brazil for the first time in recorded history.

Considering how much is at stake, it is perhaps not surprising that opposing factions have developed concerning the reality of human-enhanced climate change, just as they did on the dangers of smoking and just as some religious factions are doing on birth control and intelligent design. Democrats and Republicans have generally taken different stands about the need for effective action, and the general public is free to decide who is likely telling the truth. In 2009 Congress asked the nation's preeminent scientific organizations to consider again the reality of climatic change. Those organizations were the National Academy of Science, the Institute of Medicine, the National Academy of Engineering, and the National Research Council. The chair of the resulting Committee on America's Climate Choices was Albert Carnesale (University of California, Los Angeles), and the vice chair was William Chameides (Duke University). Panel experts were from the University of Maryland's Center for Environmental Science; Georgia Institute of Technology; University of Virginia; Michigan State University; Charles River Associates (CRA), Washington, D.C.; Resources for the Future, Washington, D.C.; DuPont; University of Arizona; Oxford University; Environmental Systems Research Institute, Cheyenne; University of Washington; Stanford University; Missouri Botanical Garden; Massachusetts Institute of Technology; WE ACT for Environmental Justice, New York; Princeton University; the National Oceanic and Atmospheric Administration; World Business Council for Sustainable Development, Geneva; Oak Ridge National Laboratory, Tennessee; Public Strategies, Inc., Austin; and the National Research Council (Committee on America's Climate Choices, 2011).

Among the committee's conclusions are that climate change is occurring, it is very likely enhanced by human activities, and it poses significant risks to humans

and the environment. The conclusions were reaffirmed in 2013 (Gillis, 2013). Sufficient data are available for the public to decide whom they want to believe, but a shift is evident in attitudes and press coverage toward greater acceptance of global warming as a reality. For example, presidential candidate Rick Perry felt the heat for refusing to recognize the problem, and even conservative publications with a focus on economics are running "wake-up" articles ("The heat is on, A new analysis of the temperature record leaves little room for the doubters. The world is warming"; Economist, 22 October 2011e). One thing is certain—we will experience the consequences, and perhaps even more than with weapons of mass destruction, climate change is one we really should get right.

A third aspect of research on vegetation history is that it shows that rain forest and other tropical communities were affected by climatic changes of the past. The middle Pliocene Paraje Solo flora of southeastern Veracruz, Mexico (3.5 million years old), was deposited along the coast where today there are coastal mangroves bordered immediately inland by a tropical rain forest. Fossil spores and pollen from the mangrove ecosystem, and even from the more distant higher altitude pine-oak, oak–*Liquidambar* (sweetgum), and fir forests were found, but none of the 9 to 11 dominants of the current rain forest. This means that in an area where rain forest is prominent today it was not present in the relatively recent geologic past. Subsequent studies have shown this to be true in other areas of the tropics. About and throughout the 1960s, however, the prevailing assumption was that rain forest vegetation and rain forest climates had remained stable over millions of years. Now it is recognized that this vegetation is a delicately balanced assemblage that has undergone profound alterations in range and composition throughout time. The reason this paradigm change is important is that it removes the rationalization that because the tropical rain forest supposedly remained stable for millions of years and survived all past environmental impacts, it can be perturbed with impunity by lumbering, burning, grazing, and farming and will always recover. Damaging or clearing large tracks of vegetation suddenly and simultaneously alters climate and soils to the extent that recovery will likely be measured in geologic time and at an enormous cost to multiple human generations. Forty trillion tons of water pass through plants via transpiration into the atmosphere each year (R. Sack, personal communication, 2011). Maintaining that change in vegetation during the past, or clearing forests at present, has no effect on climate is untenable. Given that two thirds of all organisms live in the tropics, including the wild progenitors of new medical and food plants and the genetic stock for maintaining and improving existing ones, documentation that tropical ecosystems are vulnerable to change is a contribution from vegetation history studies of some considerable importance.

One way to acquire information on ancient communities and their environments is through the study of fossils. For the interval between ca. 45 million years ago to the present, many plant fossils are similar enough to their modern descendants that in aggregate, and when augmented by information from other lines of inquiry, they provide a reliable basis for tracing the origin, diversification, and migration of specific groups (or lineages); reconstructing the physical configuration of the landscape (e.g., mountain systems and land bridges); estimating past climates (e.g., hothouse or icehouse conditions), and determining the overall history of ecosystems. All of these applications of paleontological information depend, however, on a proper view of what fossils represent, their accurate identification, and a reliable means for placing them in the correct chronological sequence.

Fossils were early regarded by some as works of the devil deliberately placed in the rocks of the Earth to lead people astray. This view became especially popular among some theologians and their followers in the mid- to late-1800s when geologist Charles Lyell and biologists Alfred Russel Wallace and Charles Darwin (Morehead, 1969; Economist, 2009a) began making uncomfortably convincing arguments that a literal interpretation of Genesis did not provide an accurate account of the origin and history of life on Earth or for the age of the Earth, then placed at about 6,000 years (and now placed at about 4.5 billion years). Fossils have been considered remains from Noah's flood and as something called "discarded models of creation." By the latter view, when God wanted to create a new life form, he first fashioned a model out of clay, and, if satisfied, he would blow the breath of life into it and place it on the Earth. If not, he would toss it out of heaven and continue until he got it right. Fossils were these mistakes in the creation process. Considering the millions of fossils known, such ineptness attributed to God by the devout is surprising. Nonetheless, it was the view of Dr. Johann Bartholomew Adam Beringer, dean of the Faculty of Medicine at the University of Würzburg, Germany, who in 1729, described 2000 such fossils lying on the surface of the Triassic Muschelkalk Formation in Bavaria (Jahn & Woolf, 1963; Gould, 2000; Taylor, 2004). The specimens included comets with gaseous tails still intact, spiders with the webs preserved, and frogs caught in the act of copulation (Fig. 27). The fossils were later found to be the less-than-divine creations of colleagues intent on embarrassing the rather pompous Beringer. Leonardo da Vinci (1452–1519) noted that such opinions about fossils cannot exist in a brain of much reason and proposed that they were nothing more or less than the remains of past life preserved in the rocks of the Earth. Fossils at the bottom of a geologic section are typically the oldest, those near the top are younger, and changes in between reflect alterations due to environment,

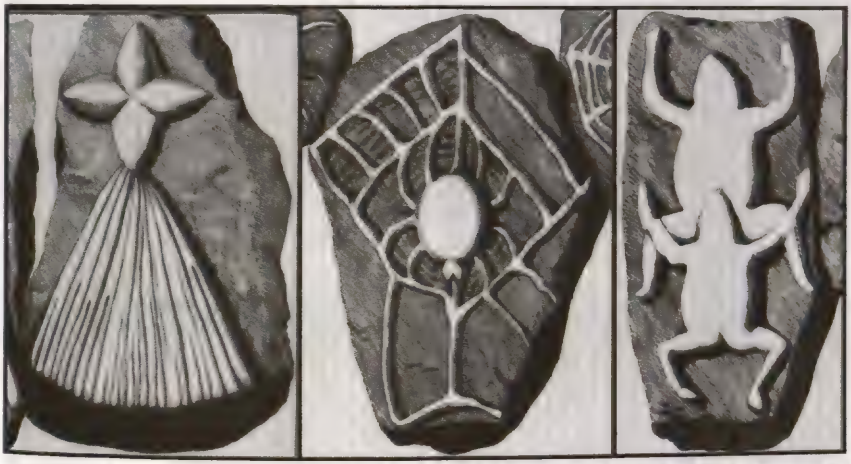

FIGURE 27. The Lying Stones of Dr. Johann Bartholomew Adam Beringer. —Left. Comet with gaseous tail. —Middle. Spider with web. —Right. Copulating frogs. *Drawings from Jahn and Woolf (1963).*

migration, extinction, and evolution.

The evidence for past life is impressive, and it includes fossil shell, bone, hide, eggs, embryos, coproliths (fossil fecal matter revealing the dietary preferences of the organism), worm borings, footprints, trails from tail-dragging animals, scales, feathers, pigments, otoliths (fish ear bones), biogenetic sediments (e.g., stromatolites), teeth, teeth marks on ammonites bitten by mosasaurs and predatory fish (Kauffman & Kesling, 1960; Martill, 1990), leaves, flowers (Fig. 28; Pennisi, 2009), fruits, seeds, phytoliths (plant crystals), amber, starch grains adhering to artifacts, pollen, spores, petrified wood, bacteria, fungi, biochemical fossils such as alkenones, skeletons, spears, arrowheads, pottery, other artifacts, and human footprints (see Fig. 29). Evidence for life begins ca. 3.5 billion years ago, and photosynthesizing eukaryotes (organisms with a nucleus) begin at 1.5 billion years (Knoll, 2004; Rasmussen et al., 2008; Whitfield, 2009).

FIGURE 28. *Hydrangea* floral bracts, 15 million years old, Succor Creek, Oregon.

FIGURE 29. Tell-tale prints. —Left. One of a 23 m long track of hominid footprints in 3.7 million years old volcanic ash, Tanzania. Photo from Dalton (2008). © John Reader / Science Source. Reprinted with permission. —Right. First footprint on the moon, 20 July 1969, by Neil Armstrong (size 10), Apollo 11. NASA photo ID AS11-40-5878.

Fossils occur throughout the geologic column on all continents and in all ocean basins (Javaux et al., 2010).

Experiences in Getting the Data and Presenting the Results

There is a worth to thy honest ignorance, 'twere almost a pity to exchange it for knowledge. (Sterne, [1760] 1941: 206)

In the 1960s it was not easy to initiate paleobotanical projects in Latin America because few localities were known. One way I devised to achieve some predictability in collecting researchable material was to base multicountry, broad-scale surveys initially on a rock type called lignite, which usually contains plant microfossils. Lignite is an important low-cost source of fuel, and its location and age are frequently better known than for less important deposits. One locality was described in the literature as along the Rio Grande just across the border

from Laredo, Texas. Our directions were to cross from Laredo into Nuevo Laredo in Mexico and proceed on a dirt road to the west to the abandoned town of Colombia, which was earlier intended as a port city when it was thought feasible to dredge the Rio Grande to accommodate oceangoing vessels.

We crossed from Laredo into Nuevo Laredo, proceeded on a dirt road to the west, and were soon lost in the desert of northern Mexico. After a few hours I tried my linguistic skills on an old gentleman watching some cattle—"Puede usted decirme, por favor, donde está el camino al Río Bravo?" He seemed a bit perplexed but replied, "A la derecha al perro." That was confusing because it sounded like he said, "Turn right at the dog." We got back in the truck, drove a little farther, and eventually came to a promising landmark (Fig. 30). Without viable alternatives, we turned right at the dog and in a few kilometers were on the banks of the Rio Grande at the abandoned town of Colombia. Apparently the dog was a semi-permanent feature of the landscape, and the old gentleman, sensing that further conversation in Spanish would be futile, used it as an effective means of conveying directions.

During an early visit to Mexico I went into a small grocery store to buy some cookies. The señora pointed to a large barrel and said, "Tres kilos?" Thinking that

FIGURE 30. Dog in the road, Colombia, Mexico, 1967.

"tres kilos" was a kind of cookie, like Oreos, I replied "Sí," and she proceeded to empty ladles of cookies into a large plastic bag. Too embarrassed to admit I did not recognize kilo as a unit of weight, I left with nearly seven pounds of just awful cookies. After several days even the starving camp dogs refused to eat them, and they were left to further petrify along Mexico 85.

For the first National Science Foundation-sponsored field trip in our project, "Studies in Neotropical Paleobotany," we used a field vehicle designed in consultation with engineers from International Harvester. It included two 19-gallon gas tanks with an in-cab conversion switch, 12-ply tires, a 4-wheel drive with 12 forward gears, a wench with a 250-foot 10,000 pound test cable, and a steel rod running in front of the differential to protect the underside from boulders.

The interior comforts, however, were minimal. The first trip in 1967 was over 10,000 miles, from Kent nearly to the Guatemala border and back across the southeastern United States to Miami, Florida. From there a student, David Jarzen, and I flew to Puerto Rico, returned to Miami, then drove back to Kent. Just out of Columbus, I suddenly became dizzy and almost passed out. I pulled over and recovered after a few minutes. We climbed back in the truck and a few miles further on the same thing happened. There did not seem to be any major health problem, and I thought it might be due to carbon monoxide or other fumes. As I climbed back in I happened to notice that the seat springs under my legs had weakened from wear, forming depressions, while the ones between my legs were fully intact. Each time we hit a bump, the middle spring bounded up and hit me in the groin causing my life to pass before my eyes. I recalled stories of machines taking over the world, but never guessed it would be in such an insidious manner.

The Tivoli Hotel in Balboa, Panama (Fig. 31), was partially completed by November 1906 to accommodate its first visitor, Theodore Roosevelt, on an inspection trip to the Panama Canal. Over the years a picturesque cadre of widows—wives of men who had spent their careers working for the Panama Canal Company—came to occupy many of the rooms. The hotel consisted of three floors, and a veranda ran around the outside of each level. When Professor Elso Barghoorn, his assistant Dorothy Osgood, my wife Shirley, and I checked in during the Christmas season of 1963 we noticed a circular plate covering a small hole in the outside wall that allowed a view into the rooms from the veranda. When asked about this, the porter said that because of the advanced age of the permanent residents, occasionally someone would not show up for breakfast, and by mutual consent, he would go up and look through the hole to see who had died during the night.

The Tivoli Hotel was a commanding white, colonial-style structure sitting on a hill, and in the sun it radiated foreign presence in the Republic of Panama (the

FIGURE 31. The Tivoli Hotel, Balboa, Panama, 1963

fenced Canal Zone cut Panama in two and in theory could be crossed only by permission of the U.S. Government). Every seven years minor demonstrations were orchestrated to coincide with negotiations for new lease agreements for the Canal, but those in 1963–1964 got out of hand, and unknown to us, the Tivoli Hotel traditionally served as a focal point for riots alleging discontent with foreign presence. Immediately across the street was a multistory, bunkerlike office building with slitlike windows that looked directly into the lobby of the hotel (Fig. 32). By late afternoon a large crowd had assembled and began throwing Molotov cocktails onto the grounds, and snipers began firing into the lobby from the windows of the office building. On subsequent visits the bullet holes were still visible in the columns in front

FIGURE 32. Office building opposite the Tivoli Hotel, Balboa, Panama, 1963. The fence marked the boundary between the Republic of Panama and the former Canal Zone.

of the registration desk. The Tivoli was torn down in 1975 when the ravages of termites and time had taken their toll. The site is now occupied by the Smithsonian Tropical Research Institute.

Lessons in Humility

During a trip to the Yucatán Peninsula in Mexico, the windshield wiper on the bus broke during a heavy rainstorm. I assumed we would be delayed by an hour or so, but the solution seemed apparent to everyone else on the bus. The driver took a rubber band and placed it over his rear view mirror then twisted the other end around the wiper blade. He tied a string to the blade and ran it across the windshield into the bus through a slight crack in the door. A passenger pulled on the string, bringing the blade across the windshield, then released it, allowing the tension from the rubber band to pull it back. We drove on, in about an hour the rain ended, and a valuable lesson in humility was learned.

On another trip, our rental vehicle had a flat tire, and there was no jack. Having learned from the windshield wiper experience, I contemplated how repairs might be made, but nothing came to mind. In hindsight it seemed simple enough. The driver rolled a rock under the axle that kept the vehicle in place, then dug a hole under the tire, removed the flat tire, put on the spare, drove the car off the rock, and we were on our way.

In December 1963, Elso Barghoorn, Dorothy Osgood, and Shirley and I (recent graduates of the University of Michigan and postdoctoral students at Harvard) were on our way to Davíd, Panama, in a rented Volkswagen. We had a flat, and the sockets on the lug wrench were too large for the lugs. A Panamanian man was watching from the front porch of his house, and after several minutes, when it was clear that in our collective wisdom we were accomplishing nothing of consequence, he came over, placed a penny on the lug, put the lug wrench over the penny and the lug, and had the tire changed within minutes.

As a courtesy to colleagues in a host country, it is usual for foreign guests at congresses to make some effort at speaking the native language. My first attempt to deliver a paper in Spanish was in 1966 at the Tercer Congreso Mexicana de Botánica in Mexico City—as much an act of faith as a courtesy. All the legendary and soon-to-be legendary Mexican botanists were there. My paper was triple-spaced with phonetic Spanish pronunciations penciled above virtually every word. When we arrived at the Chicago airport, the plane to Mexico was over 13 hours late, and to pass the time I conversed with the flight attendants about what I would be doing in Mexico. They expressed polite interest in the paper, but were most intrigued with the language and offered to render it into "real" Spanish. After the presentation a Mexican colleague said it sounded like

something written by a Tijuana cocktail waitress.

Even with all these diversions, material of various geological ages was eventually collected from several sites in the Americas, and the results recently have been published in a technical series, *Late Cretaceous and Cenozoic History of North American Vegetation* (Graham, 1999), *Late Cretaceous and Cenozoic History of Latin American Vegetation and Terrestrial Environments* (Graham, 2010b), and summarized for a general audience in *A Natural History of the New World: The Ecology and Evolution of Plants in the Americas* (Graham, 2011; reviewed by Fine, 2011, under the title, "A 100 Million Year Love Affair with American Plants"). One aspect of these studies overlaps with a topic having broad implications beyond science and warrants further comment.

Radiometric Dating: Application and Implications

When new biology and geology faculty now enter the teaching arena, especially in undergraduate courses, they must be prepared to confront questions about up-to-date scientific views on evolutionary theory, intelligent design, and human history as opposed to accounts in the Bible. Study of the geological past best contributes to our understanding of the present and offers clues to where we may be heading, when the ancient floras, faunas, climates, geologic happenings, and the human record can be placed in proper chronological order. The time frame can be a relative one—those at the bottom of a sequence came first at some unspecified period, and those overlying them came later—but determining the exact or absolute age of the organisms, processes, events, and the pace of change requires dates given in number of years.

When chemically unstable isotopes disintegrate, they give off particles of energy that may consist of two protons and two neutrons (alpha radiation; e.g., plutonium, uranium, radon). Other forms of emission are electrons (beta radiation; e.g., potassium) and electromagnetic waves (gamma radiation; e.g., cobalt). The rate at which isotopes disintegrate is constant, so the age of a sample can be determined by measuring the amount of the element and its isotope. In a hypothetical example, if an isotope disintegrates at the rate of 1 gram per year, and if the rock contains 10 grams of the decay product, then the rock must be 10 years old. Caveats are that the rock must contain no decay products to begin with and that the transformation must still be going on (otherwise it would not be known how long ago it had stopped). Elements decay at different rates, and the time it takes for half of it to decay is called the half-life. For ^{209}bismuth, the half-life is 2×10^{19} years; for ^{238}uranium, 4.5 billion years; for ^{40}potassium, 1.3 billion years; for ^{14}C, 5,730 years; and for cobalt, 5.2 years. This means that rocks, fossils, and events throughout the geologic column can de dated and that the

accuracy of any one technique can be tested by dating the rocks above (the dates should be younger), below (they should be older), and at the same horizon from elsewhere (they should be the same age). Reliability can also be cross-checked by dating the same sample using different methods and different samples using the same method.

Ages based on new radiometric technologies began appearing in the 1940s, and as long as they dealt with objects outside the general public interest, or were consistent with biblical versions of human history, there was no controversy. However, the oldest rocks on Earth consistently began yielding dates of about 4.5 billion years; the first evidence of life was found in rocks around 3.5 billion years old (Buick, 2010; Javaux et al., 2010); and the Shroud of Turin, supposedly covering the body of Christ in 32 C.E., yielded an age no older than between 1260 and 1390 C.E. Pope Benedict XVI gave a less-than-ringing endorsement of the miraculous nature of the shroud by saying it is "a burial cloth that wrapped the remains of a crucified man in full correspondence with what the Gospels tell us of Jesus" and that it should be considered as documentation of the "darkest mystery of faith" (St. Louis Post-Dispatch, 2010). As these radiometric dates for the age of the Earth, the first appearance of life, and religious objects began to accumulate, there were challenges as to their accuracy from some sects of mostly Western religions. There are two bases for making these challenges. One is to claim that methods and equipment, used specifically in those scientific fields relating to religion, generate flawed data. Technologies do not emerge in perfect form. For example, changes in the amounts of atmospheric radiocarbon over time, and the presence of isotopes in carbonate-charged waters from which some material was collected, are now known to have affected earlier ^{14}C dates, and accelerator mass spectrometry (AMS) has improved the tabulation of emissions from radioactive elements. Revisions and improvements over time in virtually every aspect of human endeavor are expected by scientists and unbiased theologians alike—in the printing, translation, and interpretation of ancient biblical texts; in the early belief in a paradise somewhere on Earth (Eden) and a continent of Atlantis; and in Pasteur's original germ theory of disease revised in recognition that microbes not only jump hosts but diversify (that is, evolve) over time, requiring new antibiotics to keep pace. Shortcomings in equipment, products, practices, and interpretations from decades past and even past centuries are occasionally presented to an uninformed and unquestioning audience as evidence that modern science, as it applies selectively to topics of religion, is equally flawed today and that the results represent little more than personal opinions and unconfirmed theories.

A second opening for challenging selective scientific results stems from the fact that scientists are reluctant to claim that their discoveries represent

unquestionable and unalterable truths. Rather, they speak of probabilities that over time establish the degree of correctness for a particular hypothesis. The probabilities may eventually approach certainty, and the discoveries are then accepted as valid generalizations or natural laws—gravity, relativity, thermodynamics, the atomic structure of matter, evolution, the germ theory of disease, plate tectonics. If not, they are discarded—a geocentric solar system, spontaneous generation, permanence of continents and ocean basins. It is always recognized that some information in an accepted model might be incomplete or wrong, and some in a rejected model might be right, so theories are adjusted over time as new information becomes available. It is the balance that determines acceptance or rejection and provides the confidence to take action based on an assessment of the probabilities—pushing a button that launches a space shuttle, turning on a light, firing up a gasoline engine, applying a brake, undergoing radiation, removing or repairing a damaged organ, ingesting medication, inhaling anesthesia, injecting antibiotics. The tendency of scientists to speak of probabilities that may approach natural laws—rather than absolute, divine-inspired truisms—provides an opening for those wishing to refute a particular theory to maintain that, because all details of the theory in its original form are not universally agreed upon from the outset as unquestionably certain, scientists are in disagreement about its validity. In its place, they present myths, and personally preferred faith-based scenarios involving miracles, and reflect the efforts of ancient people using the knowledge base of 2,000 years ago to explain the world around them as equally or more valid explanations for the origin and history of life and for the physical features of the Earth.

Faith-based beliefs are those held in the absence of reproducible, verifiable evidence (Alexander, 2008; Wigley, 2008). Science-based beliefs are those in which the validity of the assumptions and conclusions can be tested through experimentation, the consequences can be observed over time, and amendments can be made as new information accumulates. The scientific attitude can be applied outside of science; for example, to observing the results of deregulation or unsupervised self-regulation in business, the results of maintaining intransient ideological positions in politics, and the results of attempting to regulate knowledge by religions.

These are only some of the many kinds of assaults that have been made on the dignity of the human intellect by some religious factions, and which faculty must be prepared to address. Other assaults on human reason include claims of infallibility for a long line of religious leaders, when its absurdity is documented by so much evidence to the contrary[19] (King, 2009); insistence on the doctrine of original sin, which demeans humans from birth; control of the weak and

frightened by threats of an eternity in hell enforced in early days by an inquisition, and currently by excommunication and social ostracizing; forcing opinions about creationism on the young; opposition to population control when tens of millions of people are dying from starvation, malnutrition, and disease; and justifying the subservient role of women because it is tradition. The lack of strong vocal opposition to these intellectual insults by religious peers is regarded by many as equally offensive.

Institutions are not monolithic, and the above positions are a hallmark of only some although occasionally highly vocal fringes of mostly American and Christian religions. Judaism, Buddhism, traditional Chinese, Hinduism, Islam, and primal-indigenous groups, in addition to the nonreligious sector, account for about 67% of the world population, and Christianity accounts for 33%.[20] Most adjust to scientific discoveries, and none have a policy of opposition, nor do they encourage opposition to science, which is viewed as having separate methods and goals. One unfortunate aspect of opposition to selective results from science, the demand for obedience, acceptance of the supernatural, and the claim of absolute certainty, is that over time it may be affecting the growth and lifelong commitment to religion by young, intelligent, educated, independent-thinking people desiring to be part of a rational, moral, and socially responsible community. Reliable information on religious trends is difficult to obtain, and the range of available figures can be used to justify widely different positions. Among the standard sources of data on church membership are the Andover-Harvard Theological Library, the Association of Religious Data Archives; and the Yearbook of American and Canadian Churches of the National Council of Churches. Using these sources, which include 36 religious organizations ranging from the African Methodist Episcopal Church to the United Methodist Church, membership in mainline churches in the United States was 48.8 million in 1995 and 45.1 million in 2005, a decline of 7.5%.[21] This was at a time when the population of the United States increased from 262 million in 1995 to 300 million, an increase of 14%.[22] Today the U.S. population is 308.7 million, with an increase of 9.7% in the last decade (Christie, 2010b, based on U.S. Census Bureau data for 2010). Whatever the figures are for devout, active membership in conservative sects of Christian churches in the United States, immigration has kept them from going lower, membership tends to increase in difficult and uncertain times as more people are attracted to purveyors of absolute certainty, and the numbers do not reflect nonacceptance and noncompliance with selected church doctrines on matters of divorce, birth control, miracles, and the infallibility of church leaders.

These trends have not been accompanied by an increased proficiency in science, so the net result at present is a kind of drift among those Christians

seeking a rational code of ethics and moral values (Grossman, 2009). The uncertainty is furthered, even among devout fundamentalists, by witnessing the advances made in medicine, in anthropology, in the elimination of formerly pandemic diseases, and in technology—as shown, for example, by contemplating views of ancient human footprints left by our ancestors and modern ones left by their descendants walking on the moon (Fig. 29; Dalton, 2008). These accomplishments symbolize the potential of the human mind and spirit, how far we have come, and what might be accomplished to the betterment of all, with greater efficiency and less turmoil, if unfettered from the limitations of ignorance, superstition, and commercialized salvation. These achievements in medicine and science are based on the same scientific principles that produced the body of data of mutual interest to science and theology. There are ancient primates (ape-monkey-human lineage) from Libya dated at 38–30 million years ago and even older ones (*Eosimias*) from Asia (see Gibbons, 2010: 583). Skeletal material of the African hominid Lucy (*Australopithecus afarensis*; 3.18 million years old) and Neanderthals (*Homo neanderthalensis*; 130,000 years old), like the footprints, do exist for all to see (Begley, 2007). The same genetic science that provides the basis for so many advances in medicine also reveals a progression up the animal scale of complexity to a 98.5% similarity between humans and chimpanzees. Other remarkable achievements are the recently completed sequencing of more than one million base pairs from Neanderthal DNA (Green, 2006; Tzedakis et al., 2007; Dalton, 2009; Prüfer et al., 2014; Sankararaman et al., 2014), a nearly completed sequence for the extinct woolly mammoth (Miller et al., 2008), and the genome from 4,000-year-old human remains (Lambert & Huynen, 2010; Rasmussen et al., 2010). Now 125 pieces of a hominid skeleton called *Ardipithecus ramidus* have been unearthed from the Middle Awash region of Ethiopia. The 17-year study reveals that the species walked upright and that the fossil remains are 4.4 million years old, or about 1.2 million years older than the Lucy material (Lemonick & Dorfman, 2009; Science, 2009). The Geno 2.0 Project[23] involves 150,000 DNA markers currently from 500,000 individuals in 130 countries that reveal ancient ancestors and the migrations of Neanderthals and Denisovans (a newly discovered group that split from our lineage about 500,000 years ago; Harmon, 2012; Gibbons, 2013). Then, there is the recently announced advancement in the synthesis of life (Gibson et al., 2010; Economist, 2010a). As noted by Richard Dawkins (2006) in *The God Delusion*, in addition to these scientific discoveries about human history, there is an uneasiness about biblical advice on human behavior that reads like divine-sanctioned genocide cited earlier (Ezekiel 9; Joshua 6). Concerns about these inconsistencies are reflected in a series of reports on science and religion on NPR in 2006 (e.g., "Must We Have a

Separation of Church and State?"; NPR, 2006) and a PBS series on science and religion in 2010 ("God in America"; PBS, 2010), cover stories on science, politics, and religion in *Time* (e.g., the special section "God vs. Science"; Time, 2006) and *Newsweek* (e.g., the special issue, "The Politics of Jesus: An Evangelical Identity Crisis"; Newsweek, 2006), and increasingly in other publications (Mithen, 2006; Numbers, 2006; Miller, 2010; Putman & Campbell, 2010). P. Z. Myers (2008: 581), in a review of *Only a Theory: Evolution and the Battle for America's Soul* by Kenneth Miller (2008), believes that

> The United States has a big problem: although we maintain a strong scientific establishment, competitive with the rest of the world in many fields, we also have some of the most backward proponents of superstitious nonsense in both our electorate and at the highest levels of politics. It is an embarrassment to host [visitors] that are at the forefront of scientific research [to our] country where presidential candidates [in 2008] are discussing whether the Earth is really 6,000 years old as some Bible scholars say, or whether they believe in evolution.

It is astonishing as well as revealing that according to one survey about 60% of the United States population at least publically professes not to believe in evolution. Among the countries surveyed, we rank only above Turkey in that belief (Economist, 2009a). Broadcasters in the United States would not show a British film about Charles Darwin because of concern about the reaction of fringe-element evangelical Christians. This film opened the Toronto Film Festival and is scheduled to air almost everywhere in the world, from Australia to Scandinavia, but not in the United States (Singh, 2009). Zealots with bombs and zealots with Bibles both inflict damage on a nation—the latter just takes longer. A glimpse of the present state of our knowledge with regards to research into human genetics for the nonspecialist is nicely presented by Specter (2014). The article also provides insight for the specialist as to where we might be heading if ethical standards are not maintained.

The source of this national embarrassment comes from groups that rage at suppression of their own views while seeing no inconsistency or potential danger to imposing it on others. Christ as a real and compelling figure in history, the Old Testament as important historic literature about ancient people trying to explain the Middle Eastern world around them, and value of the 2,000-year-old New Testament as a source of many sound guidelines for human behavior today are compromised for many by what Sam Harris notes as having to believe that "dinosaurs lived two by two upon Noah's Ark [presumably with all other forms of

life, including the extinct multi-ton Titanosaurs and all existing microbes] . . . and that the first members of our species were fashioned out of dirt and divine breath, in a garden with a talking snake, by the hand of an invisible God" (Newsweek, 2006; see also Boyer, 2008; Cobb & Coyne, 2008; Shapin, 2008; Klinkenborg, 2009; Nature, 12 February, 2009; Ravetz, 2009; Read, 2009; Werth, 2009). Richard Holmes in *The Age of Wonder* likens it to requiring belief in a demonic anaconda and in the rainbow as some kind of supernatural skywriting (Holmes, 2008: 319, 324). Elevating hope and wishes over verifiable and correctable data in making decisions not only negatively affects the dignity of the human mind, but also leads to other consequences. A *Nature* editorial entitled "Science Scorned" notes that "the anti-science strain pervading the right wing in the United States is the last thing the country needs in a time of economic challenge" (Nature, 2010d). To this may be added a concern for the quality of our culture and, indeed, its survival in an increasingly technical and competitive world, as certain groups demean reality, common sense, education, and the sciences that can help improve the human condition. It is increasingly apparent that these improvements will have to be grounded in an ardent respect for knowledge rather than in a myopic defense of any one of thousands of personally preferred ideologies. When the mayor of Vienna was asked in 2005 why Austria functions so well, he replied, "We educate our children and we listen to our scientists." Scientists have the right and responsibility to convey their views on evolution in the science classroom; literal interpreters of the Bible have the right to present their views in their particular forums; and students have the right to decide which makes the most sense.

A personal reflection: I recall that as a child of Sunday school superintendent Hattie Louise Stamply Graham regularly attending services at the Tabernacle Baptist Church in Houston, Texas (Louis B. Quarrles, pastor), and as the nephew of two of the most evangelical of Pentecostal preachers, Harry and Bonnie Kirkpatrick, I met such stories with polite deference, a furrowed brow, and an inner question of "What?" My respect for religion and the church was not permanently damaged, however, and later it was rekindled by the sermons of Fulbright Scholar Reverend Leonard Verduin at the Dutch Christian Reformed Church in Ann Arbor, Michigan. It was not a question of the potential value of the Church, but how it has been commercialized, politicized, and abused; not a question of admiration for Christ and his teachings, but embarrassment about what has been made of him, and religion, unnecessarily, by some church leaders with various motives and by their often sincere followers. A humorous interlude in a serious debate is afforded by "An Open Letter to Dr. Laura,"[24] which asks Dr. Laura Schlessinger, a radio/TV personality who dispenses advice to call-ins on a variety of subjects—including interpretation of God's word—about

the applicability today of biblical advice offered 2,000 to 6,000 years ago to a primarily agrarian, illiterate, nomadic society on topics such as homosexuality ("an abomination;" Leviticus 18:22), working on Sunday (an abomination punishable by death—"whosoever doeth work therein shall be put to death;" Exodus 35:2), approaching the altar by anyone having a physical defect (specifically, the blind, lame, dwarves, and those with defective eyesight or a flat nose; Leviticus 21:17–20), eating shellfish (Leviticus 11:10), trimming sideburns that "mar the corners of thy beard" (Leviticus 19:27), rotating crops and wearing clothes mixed of wool and linen (Leviticus 19:19). There are other problems that arise in attempting to read history and apply literally today behavioral guidelines from a diverse collection of ancient, unsigned manuscript fragments (estimated at 44 in the 1945 Scofield Reference Bible (Scofield, [1909] 1945); the Bible Project, Brackman & Lubitch, 2011; Hallowell, 2011), written, translated, assembled, and interpreted by different people, at various times, that constitute the multiple versions of the Old Testament (Ehrman, 2005). For example, permission is granted to own male and female slaves provided they are purchased from other nations (Leviticus 25:44). The letter asks Dr. Laura if it is permissible for Americans to own Canadians and for fathers to sell their daughters into slavery (Exodus 21:7: "And if a man sells his daughter to be a maidservant… ") and what a fair price would be for a daughter in today's market.

The obvious need for interpretation and revisions in theological concepts over time is similar to that forbidden to scientific data by the fringe elements of some religions. Much of the complaining by scientists and philosophers like C. P. Snow is not against religion but against ignorance (Krauss, 2009), and when ignorance is confronted by disconcerting facts, one response is a retreat into moral absolutism. So much potential for human advancement has been lost along the way by the advocacy of a few, and the acceptance by many, of demeaning ignorance and superstition. History provides many examples of that loss from many places involving many religions. In the Middle Ages, Muslim Toledo, Spain, a center of enlightenment, fell to the Christians in 1085 C.E., and "the fundamentalism [of the Christians] effectively ended the cultural and scholarly brilliance of Islamic Iberia" (Leitão & Alvarez, 2011: 1221). Harriet Beecher Stowe (1811–1896) visited Paris in 1853 after publication of *Uncle Tom's Cabin* in 1852, but before it appeared in Europe, so she could move about the city in relative anonymity. She later said how much beauty had been lost to her because of her strict puritanical upbringing and schooling in the Hartford Female Seminary: "Senselessly and cruelly cheated . . . a long withering of the soul's more ethereal part . . . a crushing out of the beautiful. Children are born there [in puritan New England] with a sense of beauty equally delicate with any in the world in

whom it dies a lingering death of smothered desire and pining, weary starvation" (McCullough, 2011a: 217). The same may be said of intellectual beauty today when stunted by ignorance, bigotry, intolerance, religious extremism, fads, and faith-based agendas. There is a billboard in St. Louis that advertises a college "where faith enhances learning." I hope that view is not applied to instruction in science and other disciplines that rely on facts, like medicine. An old church at Hartwell House in Buckinghamshire, England, has a sign that says "Keep out." At the very least one should "Enter with caution."

On the environmental front, if the destruction of life and the defiling of habitats were as rampant and widely publicized during my early church days as they are today, and especially if this life and these habitats were attributed directly with devout certainty to the hand of God, I would have been tempted to ask, "What about this, Reverend Quarrles? Any questions from the congregation?" Surely the incongruence must be evident to the ultra devout when avowing on the one hand that "not one sparrow will fall from the sky but by the will of God" (Matthew 10:29–31), while indifferently presiding over the greatest destruction of organisms and habitats in the last 65 million years. The consequence is powerfully captured in Linda Brewer's book, *Vanishing Circles*: "Extinction is a final state of being from which there is no recovery, no going back, and no going forward" (Brewer, 2010: book cover). An importance of the Internet is that it is being used to capture in real time through remote sensing and satellite observations irrefutable documentation of events that could previously be concealed or distorted by rhetoric, including the destruction of organisms and natural environments by lumbering and mining in protected reserves (this documentation can be found, e.g., by searching for "remote sensing" and "rain forest destruction").

Issues like these often generate surprisingly little general concern because they do not affect us in an instantaneous, simple, and overt way. Like smoking, environmental degradation, poor education, and other hallmarks of modern society, the loss of biodiversity is often piecemeal and insidiously slow, requiring an agile mind to anticipate the long-term consequences and considerable discipline and coordinated effort to do anything about it. Besides, it is future generations that will pay the price of these transgressions:

> For many who frequented the garden [the Tuileries, Paris], whether to walk or to linger comfortably on a shaded bench or hired chair, the children were the favorite part of the show, all happily laughing and running about, and all amazingly (to the Americans) chattering away in French, while watched over by immaculate, full-skirted Swiss maids. "I have been there repeatedly since I have been in Paris, and have seen nothing like the children," Nathaniel

> Willis reported to his readers in the *New-York Mirror.* "They move my heart always, more than anything under the heaven" (McCullough, 2011a: 44).

The Reverend Quarrles, the Kirkpatricks, and modern-day zealots with their divine if sometimes inconsistent and confusing handbook, continue to remind us to bid little children to come unto us because they shall inherit the earth—the earth we are currently leaving them.

Teleconnections, Social Trends, and the Cultural Context of Teaching and Research

For whatsoever a man soweth, that shall he also reap.
(Galatians 6:7)

It is now time to address issues that began to appear with increasing intensity in the 1960s, including the changing technology and social attitudes within which students would have to learn, faculty would have to teach, and with which university administrators would have to contend. "Teleconnection" is primarily a meteorological term denoting that in a complex system, like weather, the causal factors are interrelated so that a change in one affects the others, and often in far-distant places. An example is the periodic warming and cooling of Pacific Ocean equatorial waters generating El Niños and La Niñas, which cause profound weather changes in distant parts of the world. With increasing globalization, facilitated by the Internet, the concept of teleconnection can also be applied to cultural and social changes because shifts anywhere can have effects everywhere.

Teaching successes, like those experienced with the biology honorary society, the Undergraduate Assistantship Program, and the Biological Field Studies courses involve interaction with individual students and shape many teachers' reactions to the excesses of impersonal electronic instruction. But the trend is toward less interaction with students. In a telling, early scene from the 1982 teen movie *Porky's*, a teacher is at the podium lecturing to a classroom of students. As the movie progresses, tape recorders appear at some of the seats until by the end of the movie there are only recorders receiving taped lectures from a boom box on the podium. Projected into modern times, the sequence would include filmed lectures compete with streaming PowerPoint videos on university Web pages or beamed directly into the dormitories and available anytime on demand.

Academics under the gun to produce publications, grants, and graduate students might deny there has been any cost to learning. However, it is widely recognized that there has been a decline in the quality of American higher education (Hersh & Merrow, 2006; and see Chapter 9), so there must be reasons. Most would further agree that there is no simple overriding reason, otherwise the problem could have been solved a long time ago. Rather, there is an immensely complex series of interacting causes. This opens the door for the logically flawed but widely cited excuse that nothing of personal preference need be changed because, on its own, it won't solve the [entire] problem. It is obvious that the multitude of factors constituting any complex problem (e.g., the debt crisis) has to be addressed one or a few at a time (e.g., a tax on the ultra rich generating $300 billion; cost savings; reducing graft and corruption) until a tipping point is reached where some noticeable improvement is achieved. However, self-interest and the discomfort with change may so commit us to the status quo that only obvious and destructive meltdowns will generate sufficient demand to start corrective action. Examples of attention-getting events that finally forced attention are the recent near-collapse of the world financial markets, the looming crisis in health care, and the environmental disaster caused by the Deepwater Horizon oil spill in the Gulf of Mexico (Crone & Tolstoy, 2010). After Three Mile Island (1979), Chernobyl (1986), and the Fukushima Daiichi nuclear catastrophe in northern Japan (2011), a single country, Germany, began corrective action by canceling plans for new nuclear power plants and systematically closing existing ones—one small step toward solving a big problem. History has shown we have not been very good at that kind of thing. Some argue that a meltdown in education has been going on for a long time, and although devastating to the nation, it has not forced political action or caught the public imagination because the consequences have been gradual, the solutions demand sacrifice, and each suggestion evokes the rationalization from some interested party "that it won't solve the problem."

For all the advantages of the measured use of electronic teaching (Economist, 2013; the benefits of disruptive innovation, see Christensen & Eyring, 2011: preface [x]), a disadvantage is a minimization of the opportunities for senior faculty to effectively interact with students, especially undergraduates, at the most critical moments and, in turn, to learn from these encounters what really is happening in American higher education. One view of student–faculty interaction is comparable to that advocated for doctor–patient relationships, namely that involvement in students' situations outside the classroom should be avoided because it complicates the advice and hard decisions that often have to be made, that there are simply too many students encountered over the decades of teaching, and that the emotional toll of personal concerns about them would simply be too great. The view is that "you can't help everyone." But this is an overly simplistic generalization. A student I met at Kent had a grade point average of 3.96 while working 40 hours/week in the evenings and on weekends because his father believed education beyond high school was a waste of time. It took little effort to acquire for this exceptional student a scholarship for his junior and senior years. It is reminiscent of Samantha Garvey, who was living with her family in a homeless shelter in New York in January 2012 while reaching the semifinals for the Intel Science Prize competition (Chang, 2012). Such experiences are the enduring intangible benefits of teaching, and viewed by both the teacher and student as chance encounters with special people. A counter opinion to the view that "you can't help everyone" is "no, but I can help him or her." Legendary teachers like Nobel Laureates George Beadle, Melvin Calvin, and George Wald would probably not be impressed with the extremes of impersonalized computerized instruction. The goal should be balance rather than expediency.

The impact of the Internet generally, and its effect on learning specifically, is now emerging as a new concern in the brave new world of education. This is addressed by Nicholas Carr (2010) in *The Shallows: What the Internet Is Doing to Our Brains* (in Britain, *How the Internet Is Changing the Way We Think, Read and Remember*). It is reviewed in the *Economist* (2010b). Carr suggests that this technology is already modifying our capacity for long-term memory, a cornerstone for intelligence, because (1) excessive stimulation renders the mind best suited for short-term activities, and (2) it promotes speed and group approval over creativity, especially in the young, who use it the most (Brown et al., 2006; Thompson et al., 2007; Barr-Anderson et al., 2008; BBC News, 2010, which discusses the effects of too much screen time; Diamond et al, 2010; Page et al., 2010; Park, 2010).

Another educational trend probably under way in the 1980s but more manifest recently is the globalization of universities (Nelson, 2010; Wildavsky,

2010), together with the emergence of online colleges. "Globalization" means that students and professors are now much more mobile across virtual international borders, actual branch campuses and the academic programs of domestic universities are being established in foreign countries, and information on the international ranking of universities is now readily available. As a result, education has become a global industry, and talented students and staff are a form of international exchange—a free trade in the commodity of minds. The emerging view is that this will increasingly intensify competition between universities and only the strong will survive. Wildavsky (2010) argues this is a good thing. It may be, and if so, it is another facet of modern education with which students, faculty, and administrators will have to cope. It further raises new questions, such as whether schools not participating in the globalization process will be increasingly closed out of world-class staff and students. Will the growth of technological colleges, benefiting from the excessive costs of traditional universities, cause a downward pressure on enrollment, especially at mid-echelon schools, causing further increases in tuition, and what will be the impact of enhanced emphasis on technological training at the expense of a broader education? A subset of this question is the effect of for-profit colleges. In worst-case scenarios they can be predatory on low-income students because of commitments obscured in the fine print. Another trend is the increasing use of interns, who have become exploitive free labor when internships are extended over years. One observer noted that social advocate lawyers now come mostly from wealthy families because only they can afford the expense of law school followed by a year or more of work without salary. Both for-profit colleges and internships are coming under increased scrutiny owing to greater student activism generated by the OCCUPY movement (Time, 2011b).

The 1960s was also a revolutionary time for education in America, and there are lessons from that time that are instructive for understanding trends operating today. The values imparted during that era (what we sowed) influenced in large measure the attitudes of those participating as adults in the world of today (what we reaped). It is likewise certain that present practices are fashioning the current generation's view about their role in the world of tomorrow. Many schools were making great strides in research focused, for example, on economic modeling and financial theory. In science, advances in research were in health improvement, national defense, engineering, informatics, space exploration, plate tectonics, databasing biological information, evolution, development of realistic approaches to conservation and sustainable development, and technological innovations for realizing the vast potentials of the 20th century. At the same time, ways were devised for achieving unprecedented power, unlimited wealth,

and political dominance, and methods were created for hacking into nationally and globally connected political, defense, and financial databases. A benefit of this disruptive innovation may be to eventually force greater honesty in what is presented to the public. However, ways were also being created for avoiding meaningful regulation and avoiding penalties for abuse—what Warren Buffet calls in the Berkshire Hathaway 2002 annual report "financial weapons of mass destruction."[25] There were widening differences between the mega wealthy who could afford education whatever the price and the vast numbers of the poor who could not afford it at any price. In the era of dazzling scientific, economic, political, and military creativity of the 1960s, there was less emphasis on, and therefore less success, in convincing students early on that in a competitive world—perhaps especially in a competitive world—there is a need for ethics and for high standards of excellence. Otherwise, the consequences will slowly but inexorably come to haunt us. In his Pulitzer Prize–winning book, *Tangled Webs: How False Statements Are Undermining America*, James Stewart (2011) lists a chilling litany of prominent figures telling blatant lies after swearing publically to tell the truth under oath: a Los Angeles detective, of all people, convicted of perjury; four Merrill Lynch executives convicted of perjury in denying knowledge of the Enron scheme to defraud investors; four partners in a prominent law firm convicted of obstructing justice, perjury, bribery, and fraud; the mayor of Detroit and his chief of staff charged with multiple felony counts and convicted of lying under oath; the Chicago police commander convicted of denying knowledge about the torture of suspects; a Hollywood director pleading guilty to lying to the FBI and a federal judge about involvement in a long-running wiretapping conspiracy on behalf of clients; the governor of New York charged with lying under oath to a state commission about soliciting gifts; the chairman of a financial group indicted on mail fraud, wire fraud, and obstruction of justice and his chief financial officer charged with lying to the Securities and Exchange Commission (SEC) in sworn testimony. Stewart (2011: xvii–xviii) concludes that America is facing a crisis: "an epidemic of perjury and false statements occurring at the highest levels of business, politics, sports, and culture . . . no one keeps statistics . . . there is simply too much of it . . . inflicting untold damage. That a witness will raise his hand, swear to tell the truth, and then do so is a breathtakingly simple proposition on which the entire American legal system rests . . . the above cases tell us what happens when that proposition breaks down."

The majority of politicians and government figures, business leaders, and other prominent persons are not dishonest to the point of criminality. The problem is subtler. All that is needed to befoul the system is for a small but visible minority to forfeit ethics for expediency because the probabilities and penalties for being

caught make it worth the chance. Two consequences loom large. First, it conveys to each generation in their formative years that these are commonplace practices for achieving success; that everybody is doing it; that winning isn't everything, it's the only thing; and that nice guys finish last. Second, the logical result of an individual abusing the system is that it benumbs reaction and forfeits any claim of abuse toward others practicing the same code of ethics. What possible moral or ethical complaint could a student who cheats on an examination or plagiarizes from the Internet have against a teacher who does not bother preparing the course, a doctor who cheats by abusing the health care system, a politician who betrays the public, a lawyer who cheats his clients, a businessman who cheats his customers, or a religious figure who exploits his congregation for financial and ideological purposes? Social systems do not normally undergo catastrophic collapse. They deteriorate imperceptibly over time until a tipping point is reached where a significant number of people, albeit still a minority, practice an "every man for himself" behavior—a fatal flaw in a societal organization. Some argue the trend is already well advanced and that it is irreversible. For those who disagree, a reality check with Orwellian overtones is to contemplate whether they believe that in twenty years perjury, plagiarism, dishonesty, dogmatism, and divisiveness will be less prevalent than today as we add 1 billion more people to the planet. Nadirs in society are sometimes followed by rebounds when vitriolic energy has been spent, enough responsible people become "fed up" with the antics of the irresponsible, and voices are raised, for example, through the Tea Party and OCCUPY movements. A turning point is sometimes further facilitated with a high-profile example demonstrating that exceptional personal achievement does not require abandoning standards. It is a choice, made by individuals, based in part on their personal and professional fashioning. Buffett notes in a 2009 Columbia University interview that "you can succeed magnificently with ethics" (Crippen, 2009). The economic upturn and some improvement in consumer confidence in early 2012 is an example of such a rebound. Even so, for every person achieving success through integrity, there are a growing number of less competent and ethically flawed individuals attempting it through other means. These cycles of ebb and flow in the national spirit are part of our history, but long-term observers are noting a trend—namely, that the lows are getting deeper and lasting longer, the damage inflected is more severe and affects a larger number of people, and the reactions are becoming more sustained, organized, and intense. Another trend is that the highs, even though they provide some temporary reprieve and afford a benumbing opportunity to "put all of that behind us," are not returning to previous levels (see Chapter 10).

Another trend evident in the 1970s with the rise to prominence of science

in the university curriculum, brought on by intensifying military competition and increasing research funds, was that less emphasis was placed on the social sciences, arts, and humanities and their role in fulfilling human potential in a civilized society, that is, a respect for values that sustain the quality of life. The question now is how violent a society has to become before those who would cut budgets for the National Endowment for the Arts, National Endowment for the Humanities, National Public Radio, public television, the National Parks Service, music and arts in schools, and other hallmarks of a civilized society realize or care that such things matter greatly. Examples of the far-reaching benefits of the arts to the future generations are after-school programs like El Sistema, which teaches music to 300,000 of Venezuela's poorest children and now has programs in scores of U.S. cities and the Abreu Fellows Program at Boston's New England Conservatory and the Conservatory Lab Charter School (PBS, 2012a). It is a commentary on the ratings-versus-responsibility mentality that at this particular point in our history such programs are rarely part of commercial television. In an ideal world they would be required viewing for those entering the political process and explored in interviews with the candidates. The answers would reveal a lot about the knowledge and enlightenment of those who would lead our cities, states, and nation.

To some this concern must sound almost naive given the extent of public acquiescence to political tactics freed from the restraints of ethics and to overt attempts to manipulate attitudes of the malleable to ensure greater influence for ideological purposes. This climate is exacerbated further, for example, by the deteriorating trend in journalistic practices and the concentration of an ever-dwindling number of organizations producing shows and printed news as low-grade entertainment for an undiscerning audience. Reporters for the *Sun*, the *News of the World*, and other media and tabloids controlled by the Murdoch group commissioned wiretapping of telephones and recording of voicemail messages for some 64 individuals, including a murdered teenager while she was missing but before her body was discovered. It was revealed that 11,000 pages of notes belonging to a private investigator showed "he conducted 2266 investigations on behalf of at least 28 different employees of News International, the British newspaper arm of the News Corporation, over several years," and that "the notebooks listed a total of 5,975 names of people who could be potential victims of phone hacking" (Lyall, 2011). Closer to home in Bell, California (April 2011), politicians and police had become so corrupt that interactions with citizens bordered on enforced servitude and systematic extortion. These conditions were exposed not by state or federal agencies, or by a press focused on superficial sensationalism and those that subscribe to it, but by rigorous reporting by the

Los Angeles Times. Other examples of injustice are uncovered by independent non-profit organizations such as the Innocence Project[26] in conjunction with the Cardozo School of Law of Yeshiva University. To date over 300 people have been freed from prison based on reexamination of faulty forensic evidence (Reardon, 2014).

When journalism—an important source of public information—is allowed to deteriorate, it does not bode well for the public good. The increase in hate-group web pages and blogs (one identified a targeted individual as "a climate-change scientist and a Jew"), the distortions of political campaigns and public debates, the advocacy of essentially unmonitored entertainment and media practices, and the vigorous opposition to imposing any meaningful standards are all parts of the same trend. The mantra now is that "conflict sells," but the question is, "who is buying, and what effect is it having?" Maybe we should be more insistent on responsible public rhetoric; maybe it's too late, or perhaps, as Morgenthau suggests, these problems are too deep seated and are "the result of forces inherent in human nature" (Morgenthau, 1948: 179). There was obviously a failure to convince many of the advantaged during their formative years that *how* one achieves will ultimately prove as important as *what* one achieves. Those anthems of the brawny—"winning isn't everything, it's the only thing," and "nice guys finish last"—join the anthem of the drugged—"turn on, tune in, and drop out"—as among the least intelligent and most damaging advice ever offered to the young. Falsifying the ages of Chinese gymnasts, drug use in the Tour de France and by American athletes during the 2008 Olympics, forfeiting the 2005 Heisman Trophy under allegations of taking money from agents, and, in science, falsifying data (Nature, 2010c, 2012) when detection is nearly certain are among the consequences of that failure. As Cornell economist Robert Frank expressed it (PBS NewsHour, 2011a), "You can't just turn selfish people loose and hope for the best. In those cases, both in nature and in the marketplace, you get very bad results oftentimes"—and so we do. The concern is that segments of society focused on accumulating material goods at any cost will eventually overwhelm the responsible minority that has the power, wealth, and willingness to effect positive change. This minority has always been mindful of tax laws, social correctness, and the many personal consequences of how they distribute their resources. Now the staggering magnitude of the globally teleconnected problems of poverty, crime, war, terrorism, corruption, poor education, public health, falling standards, environmental deterioration, natural disasters, and unabated population increase is forcing another consideration. Donors and volunteers, especially to large-scale projects, are having to decide if there is any prospect of achieving a meaningful solution to a problem or if giving, although good for demonstrating

social responsibility and gaining tax benefits, is otherwise becoming little more than a black hole for resources. For example, Howard Buffett, in a *60 Minutes* interview (which aired 11 December 2011; see Ovide, 2011), advised Bill Gates that high-tech farming techniques involving hybrid seeds and synthetic fertilizers are doomed to failure in poor African countries after the money is gone and the advisors leave. Without a reduction in population growth there is the familiar cycle of temporary improvement, followed by population increase, followed by deterioration toward even more costly, complex, and severe problems.

In the sciences at universities there are indications that the need for increased attention to ethics is being recognized and that new regulations will soon affect even those insolated in the laboratories and classrooms of the ivory tower. In 2010 the National Science Foundation issued a reminder for all Principal Investigators and administrators of NSF Projects:

> NSF COMPETES regulations require institutions in receipt of National Science Foundation funds to provide appropriate training and oversight in the responsible and ethical conduct of research for undergraduates, graduate students, and postdoctoral researchers who are supported by the NSF to conduct research.

It is telling in light of some rare but widely publicized breaches of ethics in research (Zhang, 2010) that the regulations had to be imposed from the outside.

Students and nonstudents alike of this generation are also well aware of investigations into the fairness of compensation packages orchestrated for and, in many instances, created by the recipients. In the business arena, in addition to annual salary, there are revelations of covert multiple bonuses, inflated reimbursement from public or company funds for personal expenditures, excessive stock grants, stock options, severance pay, postretirement consultant and speaking fees, golden parachutes, and multiple board memberships. Only weeks after announcing the taxpayer bailout of several financial institutions, *CNN Money* (Loomis, 2010) felt it timely to publish a further article on "Board Pay: Unchecked and Out of Hand" and on other excesses. Several organizations (e.g., Goldman, 2009; CNN Money, 2011; Hargraves, 2011; Liberto, 2011) are publicizing the annual compensation packages of CEOs, and the amounts are impressive. According to these sources, in 2009 Lawrence Ellison (Oracle Corporation) received $85.5 million; Stephen Schwarzman (Blackstone Group), $702 million; and Appaloosa hedge-fund manager David Tepper, $4 billion, reflecting the financial success of their companies (Rooney, 2010a). At about the same time, an executive at Merrill Lynch was paid $83.1 million in annual salary

while the company was falling into bankruptcy; at Motorola, $104.5 million as the stock declined from $11 to $3 per share; at Citigroup, $38.2 million when the stock went from $27 to $0.97; and at Abercrombie & Fitch, $71.8 million when the stock fell 71% (Rooney, 2009).

Closer to home in higher education, the annual salary of college coaches commonly exceeds $3 million dollars (Rhoden, 2008),[27] and those of professional athletes now reach $250 million for 10 years. Athletic programs already established cost millions and generate millions for selected institutions. However, the cost of aspiring to these ranks for most is being acknowledged as unsustainable (Greer, 2009; also see Christensen & Eyring, 2011: 128–130, 196, 241–242); during these times of dwindling resources, it is unjustifiable, and the chances of success and profitability are slight. During our early unionization and discrimination battles at Kent State (see later chapters), we were advised by a disillusioned administrator to look into the university practice of buying vehicles for an academic department and then transferring them to the athletic program to hide the cost.

Some entertainers are paid in excess of $20 million for a single picture, and some of the highest paid are being charged in increasing numbers with dangerous, irresponsible, illegal, uncaring, and contrived behavior while reveling in the notoriety. The minds of students representing the next generation of leaders must be influenced to some extent by practices of the current generation. Beyond the question of whether these public figures generate income and provide business leadership and entertainment commensurate with the rewards (Isidore, 2010a), there are the greater issues to consider: (1) Are the costs too great for the value and quality of the product received? (2) Do they contribute to and emphasize the disconnect between the mega wealthy and the disadvantaged (the richest 1% now control 43% of global assets, and the wealthiest 10% control 83%; see Guest, 2011; Luhby, 2011b) and between the ethical and the unethical? (3) Collectively, have such imbalances reached a point that they contribute to the resentment and cynicism that is beginning to raise doubts about the worthiness of the entire system? And (4) if so, are those in charge aware of the magnitude of this resentment and its potential consequences? For example, a commenter to the Perry (2007)[27] interview about college costs and coaches' salaries said, "When was the last time 80,000 people showed up to watch a kid do a damn chemistry experiment?" He might have been asked, "How would you like it if that kid, now defending you in court, running your school district, involved in governing your state or nation, educating your child, managing your wealth, or standing over you at the operating table just before you went under said, 'I was trained and my values were shaped in a society where the university paid my professor 1/50th that of a football coach?'" As noted previously, if excesses in electronic teaching, college athletics, and the other issues

just noted do not in themselves constitute the entire problem with modern-day higher education, then those benefiting can maintain it is useless to make any changes because "that won't solve the problem."

Hotbeds of disillusionment have been confined mostly to the poor and undereducated scattered in the inner cities. A report by the Food and Agriculture Administration dated 14 September 2010 notes that the hungry in the world number about one billion people and that in the United States, 49 million (16%) live in poverty (Christie, 2010a; Hargraves, 2013); the hungry and poor have long been the principal recruitment base for extremists. However, things are changing. On 23 November 2009, the Federal Bureau of Investigation revealed that a radical group had been successful in attracting disenchanted youths who were not living in extreme poverty for terrorist training in Somalia. They were U.S. citizens from Minnesota, Ohio, Massachusetts, and Virginia, so after training they had legal right to reenter the United States. Jessica Stern of Harvard University noted on a *PBS NewsHour* interview (PBS NewsHour, 2010) that the most effective means of locating youths who had disappeared and possibly engaged in illegal activity was information provided by their parents. When family structure deteriorates this deterrent weakens. Furthermore, there is the new phenomenon of easy and widespread electronic organization of groups. The Internet and social media like Twitter, Facebook, and YouTube now provide a communication network for the disenchanted, formerly isolated in small numbers in different cities, and establishes them as a functioning teleconnected critical mass of cyberdissidents. For example, Kaplan notes that satellite television and social networking Internet sites have created a single community of protesters so that what happens in Tunisia is known in Egypt and Yemen (Kaplan, 2012: preface [xx]). Currently, 699 million people in the world use Facebook, and the number is growing (Bort, 2013). In the February 2011 period of political unrest in Egypt, it was estimated that 5 million were using Facebook. While family structure has always been the primary unit for guiding adolescents and young adults, schools, churches, the conduct of peers, the behavior of famous and successful public figures, media coverage and responsible journalism, and the nation's social values have also been important. When these sources of guidance weaken, even if slightly, the problem of extremism becomes more complex and harder to solve. The point is that discontent about employment, health coverage, education costs (Regnier, 2009), opportunities, and fairness is obviously increasing through the system. The ineptness of the SEC, deliberate or otherwise, as Bernie Madoff defrauded $50 billion dollars from investors for over a decade as complaints were being filed, is a case in point. Victims noted that "the Securities and Exchange Commission, by its total incompetence and criminal negligence, has allowed a psychopath to steal

from me and steal from the world. . . . We were devastated by the SEC failure to uncover Madoff's fraud and its continued stamp of approval behind Madoff over the decades of his crimes. . . . We are what is left over, the result of stunning indifference; the SEC appears to have looked the other way on numerous occasions" (see Stewart, 2011: 425; Smith, 2013). Such instances raise in the minds of the astute the possibility that after great fanfare in setting up consumer agencies and passing hype laws for purposes of political imagery, these can be surreptitiously circumvented by deliberately underfunding and hiring woefully incompetent staff, resulting in massive numbers of cases impossible to adequately investigate. The Madoff debacle came at a time when foreclosure rates had increased by 60% (February 2008), the practice of robosigning these foreclosures by midlevel bank employees was revealed (Luhby, 2010), and when bankruptcies by Americans 75 years and older had increased by 400%.[28] Suicide rate among teens between the ages of 15 and 24 in 2010 was 10.5 per 100,000 people,[29] and recent disclosures about the increasing rates of mental illness among active soldiers and suicide among veterans are being widely publicized (e.g., Thomas, 2014, Huffington Post). Improvements are needed in virtually every aspect of American society, especially given the inherent connection between all sectors of society in the modern era. Most people have not been driven to extremism or become supportive of fringe elements in political or religious organizations, although the numbers are probably increasing. Rather, disgust and frustration with the system generates through all levels of society a greater understanding among many for those who rail against it and choose radical ideologies, and this further contributes to the divisiveness of the present. The problem can be posed as the widening difference between reasonable aspirations touted by family, schools, churches, and society and the declining opportunities to realize these goals for so many. Cole cites the view of social scientists that, "when people's aspirations are thwarted when they use legitimate means to reach those highly valued goals, because of a lack of opportunities, they will under certain conditions turn to illegitimate means to achieve them" (Cole, 2009: 321). The patience of the responsible is sorely tested by revelations of continuing abuse by political and business insiders (Schweizer, 2011). Some understanding of the basis for insider behavior is offered by Arnold Ludwig (2011) in *King of the Mountain: The Nature of Political Leadership*. The current protest movements are not so much a railing against a political system as a reaction to outlandish insults to the dignity of the majority (Simes, 2011). These insults come from a small minority with more power than they have been intellectually endowed or ethically trained to handle. The gates of nations have always been rattled from the outside. Now they appear to be shaking more and more from the inside. The ivory towers great

and small will be affected by growing and coordinated grass-root agendas, so it becomes the responsibility of educators in all disciplines to address the causes and to convey to students the value of ethics and activism and the hazards of "selling out."

Numbers, Percentages, and Economic Models

When attempting to get a feel for the magnitude and demographics of social change, it is necessary to distinguish between numbers and percentages. Assume that the percentage of responsible, law-abiding persons in the world was 90% in 1950 and that it will be about the same in 2050. However, the population of the world was 2.5 billion in 1950, 7 billion in 2011 (Parker, 2010), and it will be 10 billion in 2050 (BBC News, 2011; Economist, 2011f, 2011g; Engelman, 2013), so even in this unlikely scenario the disenchanted (the poor, hungry, ill, undereducated, angry, and resentful of social and political practices) would double numberwise from 250,000 to 500,000 (Hargraves, 2013). Summer teenage unemployment was about 24%,[30] and for black teens in 2012 it was 39.6%[31]—and these are percentages. Reducing population growth in disadvantaged and developing countries, along with curbing unsustainable overconsumption in developed nations, is important for buying time to solve many problems, but even if the global birth rate dropped to zero tomorrow, problems in health, education, and the environment stemming from today's overpopulation would continue for generations. The undereducated and undernourished children of today are the undereducated and ill adults of tomorrow. Regardless of personal and religious dogma about birth control, surely it is obvious that adding two billion people to the world population by the end of the century is inane, if not inhumane, and does not make solutions easier. No one is arguing that our numbers are decreasing, so the trend is daunting because the figures do not represent just the disenchanted. They represent the reservoir. Robert Kaplan noted in a Charlie Rose interview (PBS, 10 October 2012b) the volatile mixture of social media and youthful unemployment.

Higher education is one component of American society, and it influences and is influenced by these forces. It is a deceptively simple concept that, just as the increasing input of heat energy into the atmosphere must roil climates, the input of emotional energy in the form of anger and resentment, stemming from ignorance, idleness, prejudice, and unfairness must agitate societies. In education the enfolding arms of the ivory tower where some faculty could formerly isolate themselves from such issues are constricting.

Economic theories advocated as sound government policy range from those of Adam Smith (markets will find their own level of efficiency if left alone;

i.e., they should be deregulated) to modern computer-generated, multifactored models (concluding that unemployment for some is unfortunately necessary to prevent inflation; a low savings to high personal debt ratio is regrettably the price some must pay for reinvigorating the economy; an organized workforce retards the efforts of management to enhance wealth; outsourcing is one unavoidable option if worker costs or corporate taxes should become burdensome; self-provided health, education, unemployment, and retirement plans should be national policy so the general public can ensure their own future "without government interference"—i.e., you're-on-your-own economics). There is little evidence that two new blatantly necessary factors are being added to the models. One stems from the greater activism energized by the OCCUPY and other nonextremist advocacy movements facilitated by the Internet, namely, that economic theory so beneficial to the 1% will no longer be laid so easily and so arduously on the backs of the 99% without consequences. That seems obvious from Wall Street to Cairo to Tripoli. The other is the expectation that all levels of society will sacrifice during economic hard times. That seems obvious from simple psychology. For an administrator or executive to receive millions of dollars in compensation and even more surreptitiously during these times, especially when leading the institution toward mediocrity or bankruptcy, is being widely regarded as outrageous and is generating outrage. Earlier, such resentment was often deflected by other intervening events and was dispersed, disorganized, and could be ignored because it took time to ferment into action, but in today's world, "it's surprising how time slips away."[32] A better distribution of wealth and greater shared sacrifice are implicit in the concept of fairness, and greater fairness is necessary in any economic model pretending to relevancy.

The 1960s and 1970s probably were simpler times, and certainly exciting for education, but the foundations for future attitudes and values were being laid down then just as they are being laid down now. Some schools were placing unimaginable opportunities and technological creations in the hands and minds of graduates. At other schools, however, another perspective about conditions in the ivory tower was beginning to emerge. It was the sense that at some universities the level of administrative ineptness and indifference to faculty and student concerns was reaching a point unacceptable to even the most tolerant of academics. Resolutions passed by a faculty senate could be ignored with impunity because they lacked means of enforcement. The few who saw the political incongruence of a profession in which students did not vote, heeding the advice to "turn on, tune in, and drop out," and in which faculty did not organize were outnumbered by those opposed to collective bargaining on college campuses. The fact that education was the only one of three major

professions not represented by a union and, in terms of financial support and influence, was at the bottom of barrel, and in decline for decades, still did not constitute for many a convincing argument for collective action. The medical and legal professions had long been organized into powerful unions via the American Medical Association and the American Bar Association. Lobbyists for highway construction, land development, financial institutions, defense contractors, tobacco manufactures, coal companies, the oil industry, the commercial entertainment media, and gun rights all have the attention of political figures because they deliver votes, influence, voices, and money. In 2009 the U.S. Senate narrowly defeated a provision allowing gun owners to carry concealed weapons across state lines onto highways and into stadiums and public meetings unless screened. The top lobbyists through the first half of 2008 were the drug and health care companies with traceable contributions of $113,000,000 (Hargraves, 2008) or $400,000,000 including political advertisements (Liberto, 2009), as well as payments and gifts from companies to doctors advising patients about the efficacy of drugs manufactured by those companies. It is not coincidence that the mantra of the day is that the cost for health care has been allowed to soar out of control. In 2009, British Petroleum alone spent $16 million for lobbying in Washington, D.C., and $3.5 million in the first quarter of 2010 prior to the Gulf of Mexico disaster (Liberto, 2010). The business lobby U.S. Chamber of Commerce spent $81.3 million in the first nine months of 2010.[33, 34] The total of just these expenditures for those years is $500,800,000. In contrast, lobbying in 2008 for education at all levels was $51,000,000 (Hargraves, 2008), mostly for elementary and secondary school issues. It is not coincidence that when state and federal budgets are cut, it has been the environment, our national parks, public television and radio, the National Endowment for the Arts, regulatory and public interest agencies, and education that feel the brunt. After the tornado that leveled Joplin, Missouri, 22 May 2011, governor Jay Nixon proposed that funds for rebuilding come from a 12.5% cut in higher education (CBS News, 2012). This follows another long tradition of selling lottery tickets and gambling issues to voters by promising the revenues will benefit education then reneging or decreasing the overall education budget by a comparable amount. Astonishingly, as Ireland emerges from its worst recession in 70 years, and claims to start developing a "knowledge-based economy," it cut funding for public-sector research (Turner, 2010) and lost a strong defender of science, Chief Scientific Adviser Patrick Cunningham (Butler, 2012). In the political hierarchy of importance, such things just do not count for very much, even though for the quality and endurance of a nation's culture they are central. This is shown by the current debate about the perceived decline in ethics, morals, family structure, civility, and global respect

for the country as power and influence is concentrated in the hands of a smaller number of people focused on further enhancing their advantages and promoting their ideologies without "repressive regulation." The socially responsible wealthy make contributions of inestimable value to the quality of life of the country through support of the arts, education, medical research, conservation, and other causes. Volunteers from all social strata make admirable donations of time and talent to improving the lot of less-advantaged individuals and to the collective spirit of the country. However, the intensifying separation between the haves and the have-nots—in health, wealth, opportunity, respect, knowledge, and, therefore, power—in the view of many historians does not bode well for the future. Among other things, it generates disregard for laws perceived as designed primarily for the benefit of the wealthy. In groups organized as societies, when a guesstimated 85% of a population gets fed up with a guesstimated 15% (or 99% with 1%), the 15% usually has a problem. Even those expressing discontent through the ballot box are now often voting "against" rather than "for" people and policies that they have selected with care and reason. Throughout history, from Louis XVI and Marie Antoinette in 1793 to Czar Nicholas II in 1918, the majority has eventually ruled, as dictators in Africa and the Middle East found out in 2011. Nations near the end of their cycle of dominance should provide examples to those on the ascent of things to be preserved and ones that need adjustment for the new order to succeed.

Checks and Balances

Democracy and free-market capitalism are the best political and financial systems to have evolved, and some lessons from the past are available for fine-tuning future versions. One lesson is that an educated, informed, and activist public has been the most effective deterrent to the excesses of the 1%. Another is that differences exist in individual abilities and work ethics, and these differences will result in some economic and educational stratification in society. History has shown that systems attempting to allocate similar rewards to every individual regardless of ability and effort do not work. It is also unrealistic to suppose that among the approximately 196 nations and nine billion people in the world there will not be local and temporary instances of inequality due to bad luck, unfairness, and the unethical behavior of some persons. It is impossible to police every situation and undesirable to unduly stifle reasonable competition in the name of preemptive justice. Attempts to do so have proven unworkable in the long run, just as unmonitored self-regulation is proving now. Recall Robert Frank's caution about turning the selfish loose on society without adequate restraints and watching the results (PBS NewsHour, 2011a). A workable system requires

balance—or, as Cole (2009: 374) prefers, enlightenment—to ensure that the unfairness is not perpetual, does not severely affect a large and ever-growing number of people, and does not become acceptable or of indifference to the 1% and the body politic. Many feel this is the situation that exists now and that something must be done and that we no longer have the ethical or altruistic resolve to do it. As noted, an irresponsible minority can checkmate the effects of a responsible minority when acting within an indifferent or unorganized majority. Others believe the system is not broken but badly in need of repair—and that it is still repairable (e.g., Friedman & Mandelbaum, 2011). Whatever direction the national character is taking toward whatever destiny lies ahead, the attitudes of the present generation are being formed, and those emerging attitudes will shape the future. A nation in gridlock and maneuvering ever closer to the brink of chaotic ethics, standards, and tolerance is the reality in which educators currently operate, and influencing values for the better is the monumental goal for education at colleges great and small.

Another trend affecting the country in the 1960s and 1970s, including its universities, was a growing awareness of the second-class citizenship imposed on 50% of Americans in the form of gender discrimination. Some women may have dropped themselves out of the race, but that does not address the question of why they did so. Professional women were frequently hindered in their quest for equality by those occupying midlevel administrative positions bent on preserving their comfortable havens, while higher administrators gave tacit approval by inaction. In some instances academia faced this challenge with distinction, and in others the response was as expected from administrators who attained their positions through one of the routes previously described. Changes in gender issues are now being forced by the fact that ca. 56% of college undergraduates and 59% of graduate students are women.[35] Some examples of blatant discrimination still persist, but more subtle forms are also being uncovered. For example, *Nature* (2010a: 665) reports that "biomedical research continues to use many more male subjects than females in both animal and human clinical trials. The unintended effect is to short-change women's health care" and "medicine as it is currently applied to women is less evidence-based than that being applied to men."

The students, faculty, staff, and administrators at Kent State University as elsewhere in the 1960s were coping with the increasing demand for gender equality and with the emergence of collective bargaining, within the context of the social trends noted here, but it experienced another event that set it apart from the others and fixed it forever as an icon in American history.

The Shootings—An American Tragedy

On the evening of Monday, 4 May 1970, the television news in Amsterdam where Shirley and I were working was carrying the usual stories of interest to Europeans about weather, trade, politics, and festivals. Then there appeared on the screen a picture of Kent State University. The school at that time was relatively unknown, nestled obscurely in the hills of northeastern Ohio, and it was an unexpected subject for a prime-time story on Dutch television. However, prime-time news it was because Governor James A. Rhodes, a candidate for the U.S. Senate at the time, in consultation with Kent mayor Leroy Satrom, had ordered the Ohio National Guard into the city and onto the campus. The guard was under the command of Generals Robert Canterbury and Sylvester Del Corso, and the president of the university at the time was Robert I. White.

The fateful consequences have been covered extensively in television documentaries, innumerable articles, and in several books, including *Kent State: What Happened and Why* by James A. Michener (1971). The events that led to the killing of four students—Allison Krause, Jeffrey Miller, Sandra Scheuer, and William Schroeder—and the wounding of nine others was precipitated by the decision of President Richard M. Nixon on 30 April 1970 to expand the Vietnam War into Cambodia. The reaction at Kent State began on the first of May, when an unruly group broke shop windows and set a fire in the streets of downtown Kent, prompting the call from Mayor Satrom to Governor Rhodes for help in quelling the demonstration. On the second of May, at about 8:00 P.M., some unidentified demonstrators burned a temporary wooden structure, scheduled to be demolished, that was serving as the ROTC building on the campus. On May third, Governor Rhodes gave a campaign speech at the fire station in Kent proclaiming that "student demonstrators are worse than Brown Shirts [Nazis] and the communist elements and also the Vigilantes . . . the worst type of people that we harbor in America" (Hildebrand et al., 1993: 166). He added, "we are going to eradicate the problem"[36] (David Hanson, 2000). He probably held such beliefs, but it is likely the rhetoric was also calculated to inflame the passions and gain the support of the crowd. Experience has shown that when extreme elements in society are confronted by complex events beyond their control and comprehension, they are quick to support authority in "restoring law and order," regardless of how many laws are broken or how much disorder is created in the process. Hence, the bizarre comments by those so often and so easily manipulated, including some parents, that if their children had been involved in the protests they should have been shot, too; a special prosecutor said that the guardsmen should have shot more of them.

On the nights of the third and fourth of May, helicopters flew over Kent with searchlights beaming down on the campus and surrounding neighborhoods. At about midday on the fourth of May, the guardsmen moved up a hill, away from the gathering students, toward the Architecture Building. At 12:25 P.M., with Brigadier General Robert Canterbury in command, a disorganized assemblage of mostly young National Guardsman fired 60 to 70 rounds into the crowd of unarmed students for 13 seconds. The Kent students killed were all 300–400 feet away from the guardsmen, and the Justice Department concluded the students did not pose even a remote threat. The government-appointed Scranton Commission said that "even if the guardsmen faced danger, it was not a danger that called for lethal force. The 61 shots by 28 guardsmen certainly cannot be justified."[37]

Rhodes's statements about communists, Nazis, and vigilantes are examples of politically profitable proclamations that divide at a time when conciliation is

most needed. Now that the consequences of such extreme rhetoric are evident for all to see, and to count, at Kent State and in the Middle East, its influence should have peaked. Sacrificing America's interest undoubtedly will provide continuing opportunity for personal notoriety, particularly for those molded by behind-the-scenes agents skilled at creating caricatures that the gullible sector of society will subsidize. Surely, however, for responsible conservatives and liberals, the educated and those less formally educated, young and old alike, the haunting scenes of a military killing at home or sacrificing abroad its own youth should give pause to reflect that something is wrong and that tolerance, civil dialogue, and conciliation is the need of the moment. Proclamations from the national leadership, like President Clinton's statement that "there is nothing wrong with America that cannot be fixed by what is right with America"[38] is of inestimable greater value than calling protesting students "Nazis" and those opposing the war in Vietnam guilty of some perverted definition of treason.

In this connection, in 2009 the Wharton School of Business at the University of Pennsylvania in cooperation with the *Nightly Business Report* on PBS aired a list of "The Top 30 Innovations of the Last 30 Years" that addressed a pressing social need and made a significant improvement in the quality of American life.[39] Regardless of individual preferences on the list or their ranking, it provided a timely focus on the many things that are right with the country. Among endless examples, I will mention one that is among my earliest memories of a national event. Marian Anderson was a contralto about whom Arturo Toscanini said, "She has a voice that one hears only once in a hundred years" (Voice of America, 2009). Despite such accolades, when the impresario Sol Hurok tried to book her into Constitution Hall in Washington, D.C., in 1939, the owners of the hall, the Daughters of the American Revolution, refused, stating it was for concerts "by white artists only, and for no other purpose."[40] Eleanor Roosevelt intervened, and on Easter Sunday, 9 April, Marian Anderson gave a historic performance to between 75,000 and 100,000 people from the steps of the Lincoln Memorial (Fig. 34).[41] The adulation of so many people in Washington, D.C. in 1939 is reminiscent of the presidential election celebration in Chicago in 2008, ushering in a toning down of attacks on academic freedom during the recent Bush era (Cole, 2009: chapters 11–14). However, the aftermath of both events is also similar in that it reveals the extremes to which elements of a defeated minority will go to forestall accomplishments while vociferously proclaiming that democracy has as its centerpiece the rule of the majority. Fradulent claims fan the emotions of sincere people to extremism so the ousted can reimpose a rejected ideology; hence, the admonition by Bill Clinton to never vote when you are angry—you could make a huge mistake. The 1939 events in Washington and in 2008 in

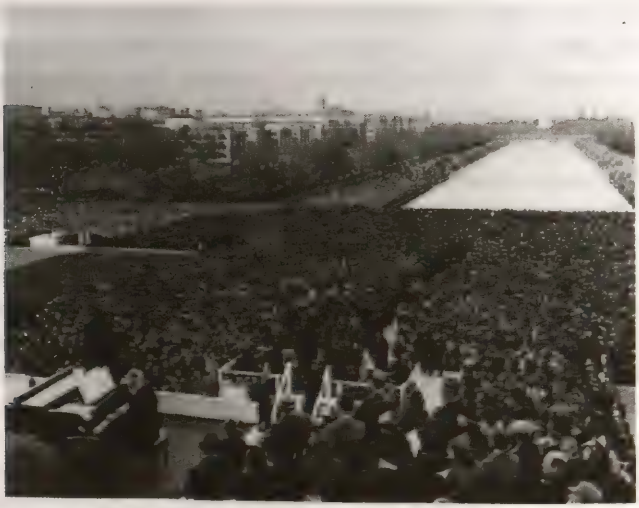

FIGURE 33. Marian Anderson performing at the Lincoln Memorial, 9 April 1939. National Archives photo 306-NT-965B-4/ARC 595378.

Chicago revealed a quest for excellence, and they stand in marked contrast to self-serving utterances about what is wrong with America.

Strands of quality often emerge unexpectedly in the nation's fabric, as in the announcement by Bill Gates and Warren Buffett that 40 billionaires have agreed to donate half their wealth to charity (Blankinship, 2010). In 2006 the nation's approximately 71,000 foundations made grants totaling about $40 billion (Cole, 2009: 484). The five largest donations in the United States for 2011 totaled $1.840 billion, including $800 million from Alice Walton of the Wal-Mart family for establishing the Crystal Bridges Museum of American Art in Arkansas. The other four went to American universities: Cornell, $350 million, from the Atlantic Philanthropies Foundation, Charles Feeney (Duty Free Shoppers Group) to finance a new engineering campus; Carnegie Mellon University, $265 million (in addition to $125 million to the University of Pittsburgh), from William S. Dietrich II (Dietrich Industries), to the College of Humanities and Social Sciences, and the School of Arts and Sciences, respectively; the University of Pennsylvania, $225 million, from Raymond and Ruth Perelman (RGP Holdings), to the University's School of Medicine; and the University of Southern California, $200 million, from David and Dana Dornsife (Herrick Corporation) to USC's College of Letters, Arts, and Sciences. These acts are also covered by the media (Blankinship, 2010), and they are an antidote to the negative portrayals being foisted on the current generation.

Almost all movements to challenge authority are lead by the young. As

expected, there are faltering first steps because the activism and enthusiasm of intelligent youth have not been forged by time and experience into wisdom. In efforts to change systems perceived as corrupted by greed and mismanagement, like financial institutions in the United States or dictatorships in the Middle East, there is little time to formulate answers to the parallel question: replace it with what and with whom? That was one of the dilemmas of the Tea Party, and it is the challenge of the OCCUPY movement. Even so, challenge is a necessary start to improvement, and it often includes the raised voices of students. As noted by Rick Steves (Citizen Ambassador Program) at Stanford University in 2009, perhaps we are now trying (or being forced) to reverse a trend and enter an era when we deal more thoughtfully and more respectfully with segments of our own population and with the other 96% of world humanity. News organizations report positive changes in that direction. The *St. Louis Post-Dispatch*[42] noted, for example, that research at universities is receiving increased support through the federal stimulus package—more than $110 million as of 2009 at Washington University sustaining or providing 150 new jobs that could soon rise to 500. At Harvard, sponsored research rose by 7% thanks in part to the federal stimulus (Christensen & Eyring, 2011: 190–191). The Nuclear Security Summit, held in Washington, D.C., on 12–13 April 2010 with 49 world leaders and heads of agencies, was widely hailed as a fresh initiative to increase awareness for the need for improved nuclear safety. In contrast, there are political forces at work that would stalemate such efforts no matter the cost to the nation.

In the midst of such deeply emotional events as the Kent State shootings, some momentary reprieve is always welcomed. Such a moment was provided by University President Robert I. White while testifying before the Scranton Commission in the auditorium of Cunningham Hall (Biological Sciences Building). In attempting to convey the fact that the small campus and city police forces were overwhelmed by the magnitude of the event, he said that security forces lacked the intelligence to deal with the situation. Those in the auditorium blaming the establishment and those faulting riotous students both cheered.

The judgment of history seems to be that the Vietnam War was one of the most tragic and costly mistakes of our history. It molded a generation of young people aware of and disgusted by hypocritical leaders prattling on about laws, morals, and responsibilities (e.g., Vice President Spiro Agnew, who was convicted for accepting bribes while in office), and it contributed to the aftermath of a drug culture that was, in part, a response to an establishment deemed untrustworthy. Somewhere along the way we also lost a measure of family stability, as evidenced by the nearly 50% of first marriages that survive less than 15 years (and therefore breaking up during the teenage years of many children[43]), and simultaneously

we have gained a critical mass of churches that have severely weakened their creditability for thoughtful young people through such insults to the human mind as sanctioned gender inequality, adherence to intelligent design, claims of their own infallibility by church leaders, and ethically suspect evangelists appealing to the poor for money. My evangelical relatives Bonnie and Harry Kirkpatrick would be appalled at such appeals, my aunt Lois would be astonished at their success, and it is difficult to imagine how Jesus would be regarded considering his regulatory actions against accepted business practices in the temple. It might be expected that by now we would be more vigilant about entering another military morass led by misinformation, and with incalculable economic benefits for some and devastating consequences for others. Perhaps there should also be some suspicion about writing hands and talking heads that take outrageous positions that add to their personal fortunes. But here we are again, trying to extricate ourselves from the latest tragedy brought on in part by what President Dwight Eisenhower called "the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex" (Eisenhower, 1961) and waiting to experience the accumulating long-term consequences of that failure. That admonition by a world leader in 1961 was preceded by Calvin Coolidge's remarks in the 1930s about the dangers of letting the accumulation of wealth and power become the goal of society. There were even earlier cautions by influential figures as far back as the mid-1800s. In 1867 Richard Wagner was already expressing concern that the trend toward materialism was getting out of balance, to the detriment of Europe, and expressed these concerns in the widely performed and much-discussed *Das Rheingold* and other operas of *The Ring*. He foresaw a dark future for a political system obsessed with money in the absence of an ethical system to contravene the excesses. Thomas Carlyle called *The Ring* "our northern Iliad" and further urged opposition to materialism without bounds (Lee, 1998).

There is a limit to the number of assaults a nation can withstand on its integrity, especially in light of competition from emerging nations like Brazil (Petherick, 2010), India, and especially the People's Republic of China, which are well positioned to assume global leadership. If the decline in some critical components of our country is approaching, or has reached the point of no return, this generation of Americans will witness the results. Some movement away from the brink has been attempted since 2008, but this is being countered by the intensifying rhetoric of ultraright-wing groups, fanned by media personalities that benefit from the turmoil they help create.

It might be expected that an event of such devastating importance as the Kent State shootings would permanently alter the course of the university. There certainly was a decline in enrollment, and for years the university remained an

embarrassment to the political establishment in Columbus—what politician would want to jeopardize a political career and incur the wrath of fringe-element conservatives by supporting such a hot bed of radicalism? After all, "they" had the audacity to believe the Vietnam War was wrong and had challenged authority. So the state and local leadership did virtually nothing. For decades the state did not even offer condolences to the parents of the students killed and injured, even after the findings of two federal commissions. But memories of the tragedy would not go away, so an unsettled feeling persisted that closure had not been achieved. And of course there was that mesmerizing picture by John Filo of Mary Ann Vecchio kneeling over the body of Jeffrey Miller that continues to anger, astonish, and sadden. But after all, they had been labeled Nazis, communists, and vigilantes, and some bought the labels. Finally, 20 years later, on 4 May 1990, Governor Richard Celeste said on behalf of the state the words lesser politicians and administrators found so difficult to utter: "It was wrong, and we are sorry" (Hildebrand et al., 1993: 238).

However horrendous the 1970 event, the university did not veer significantly from what it had been before the tragedy. It continued to plod along under the radar, with the faculty teaching their courses, students attending classes with little interest in the Students for a Democratic Society (SDS) or the Weathermen, which split off from the SDS in 1969. The event propelled Kent State into an unwelcomed notoriety, but in day-to-day activities it settled back into its former routine, and so it remains today. Central to this seemingly incongruous situation is that every four years the student body at a university changes—most of those enrolled today were not even born in 1970—and one generation tends to forget the lessons learned by its predecessors. Those responsible for tragedies encourage our neglect by devices such as the absence of suitable memorials, lack of apologies, and use of the oft-repeated phrase "the American people just want to put all that behind us." And perhaps most do. If successful, the scene and its perpetrators will fade into obscurity, and the stage is readied for the next act. Without the perspective of history, we can only suspect that over time things seem to be imperceptibly drifting downward on the scale of honesty, excellence, and integrity. Others are noting the same trend. As early as 1993, William Bennett wrote an article in the *Wall Street Journal* entitled "Quantifying America's Decline" (Bennett, 1993). In it he cites figures from the Index of Leading Cultural Indicators, created by the Heritage Foundation and the organization Empower America, for 1960 through about 1993. This index is a "values" indicator, similar to the Conference Board's Index of Leading Economic Indicators, dealing with moral, social, and behavioral conditions in America. According to Bennett, "Perhaps no one will be surprised to learn that, according to the index, America's cultural condition is far from

healthy. What is shocking is just how strikingly some aspects of American life have declined in the past 30 years": a 560% increase in violent crime, a 419% increase in out-of-wedlock births; a quadrupling in divorce rates; a tripling of the percentage of children living in single-parent homes; more than a 200% increase in the teenage suicide rate; and with reference to education, a drop of almost 80 points in SAT scores as of 1993. Even with intervals of reprieve, these trends continue. In 2012, they were the lowest in 40 years.[44] The effects of the decline and stalemates at solution through indifference and political opposition are evident at home and are being noticed abroad. In a *Times of London* article by Anatole Kaletsky (2010) entitled "American Pessimism Could Take Us All Down," he notes that this pessimism is at all levels and across the political spectrum: "What is extraordinary in America today is the vehemence of this opposition." Although in the past 30 years the population of the United States increased 41% and total spending for societal needs increased by 500%, spending for education over these three decades increased by 225%—or by less than one half. Other figures cited by Bennett (1993):

- SAT scores plummeted from 975 in 1960 to 900 in 1990.
- Out-of-wedlock births were 5.3% in 1960, rising to 18.4% in 1980.
- Children with single mothers were 8% in 1960, jumping to 18% in 1980.
- Children on welfare were 3.5% in 1960, increasing to 11.2% in 1980.
- The teenage suicide rate (per 100,000 persons) was 3.6% in 1960 and 10.0% in 1985.
- The violent crime rate (per 100,000 persons) was 16.1 in 1960 and dramatically climbed to 53.3 in 1985.
- Average daily TV viewing increased from 5.06 hours in 1960 to 6.55 in 1990 (for a total per year of ca. 2550 hours, or the equivalent of 100 days). No assessment was made on the change in quality of programming, no comparative figures were available for time devoted to homework; and the survey was before the impact of video games, cell phone use, and other electronic devices.

Studies are attempting to quantify the widespread belief that moderate to excessive television watching is harmful. One study at the School of Population Health at the University of Queensland estimated that Australians 25 years and older watched 9.8 billion hours of television in 2008, and this was associated with the loss of 286,000 years of life (Veerman et al., 2011). Another study reported in the *New England Journal of Medicine* found significant weight gain associated with watching TV because of the associated inactivity and intake of

fattening food (Mozaffarian et al., 2011). Regardless of the final figures, the negative impact on our minds and bodies has been sufficiently well established that it should cause concern. Of course there are interests at work suggesting—as they do for smoking, global warming, and intelligent design—that there is no impact or that it is actually positive. Besides, reducing TV watching "won't solve the whole problem." In an interview about his book *The Greater Journey*, David McCullough was asked, "We often can't understand how people in the past could have owned slaves or not educated girls. What do you think people will wonder about us?" His answer: "How we could have spent so much time watching TV" (Luscombe, 2011).

In another recent assessment, the Committee on Prospering in the Global Economy of the 21st Century (2007) of the National Academies published *Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future.* That report notes that the advantages the United States had in the marketplace and in science and technology are eroding. Heilprin (2011) reports that the United States has tumbled down the scale of competitive economies from 1st place in 2008 to 5th place behind Switzerland, Singapore, Sweden, and Finland. In education, the Programme for International Student Assessment found that U.S. students rank behind students in Shanghai, China; South Korea; Finland; Hong Kong, China; Singapore; Canada; New Zealand; Japan; Australia; The Netherlands; Belgium; Estonia; and Poland in academic achievement by the age of 15 (Economist, 2011d). Among the recommendations are to vastly improve elementary and secondary school mathematics and science education and in higher education to strengthen our commitment to long-term basic research. It is ironic and perhaps even dangerous at this time of intense global competition that groups are working feverishly to undermine such improvements, perpetuate suspect political ideologies (e.g., denial of global warming; Randall, 2011), and force faith-based religious agendas (e.g., intelligent design) into modern-day science classrooms. The above trends are the result.

David Longanecker (2004: 24) has discussed trends in higher education with a focus on the western United States. He notes that the goals are admirable—"to provide broad access to high-quality education for all citizens who can and want to benefit, and to do so as cost-effectively as possible." He further notes that present circumstances will severely test our abilities to meet these goals because of the "growing number of prospective students, changes in the characteristics of those students, and limited resources—each cresting at the same time." Nationally, there was an estimated 13% increase in college applicants between 2002 and 2012 (O'Shaughnessy, 2014), in the U.S. west it will be 25%, and in some states like Nevada it will be 100%. In California, 750,000 new students

are expected every year until the end of the decade, which is equal to 20 new campuses, each with 20,000 students. Communities of color will supply about 54% of the high school graduates in the west (Kurtz, 2013). In terms of financial support, the picture is bleak. With three fourths of the states facing budget deficits, higher education has been hit the hardest. The Rockefeller Institute of Government projects that all but four states will face ever-greater budget deficits in the next decade (Longanecker, 2004). The response has been a steady increase in tuition, like the annual average of 7.8% in Colorado schools, further widening the disjunction in opportunities between the vast and increasing numbers of the poor and vastly fewer numbers of the rich. Currently, tuition and fees alone can exceed $30,000 per year to nearly $40,000 per year with room and board, and the majority of students pay more than $9,000 per year for college (Marris, 2010). At the elite schools the cost is even more impressive. Tuition and fees[45] for the academic year 2010–2011; for 2013 see Ellis, 2013:

- Connecticut College: $43,900; with room and board, $53,110; an increase of 3.9%; in 2013, $63,200.
- Sarah Lawrence College: $43,564; with room and board, $57,384; an increase of 3.8%.
- Columbia University: $43,304; with room and board, $53,874; an increase of 4.8%; in 2013, $61,116.
- Vassar College: $43,190; with room and board, $53,090; an increase of 3%.
- George Washington University: $42,905; with room and board, $53,025; an increase of 3%; in 2013, $60,184.
- Wesleyan University: $42,384; with room and board, $53,976; an increase of 4.9%.
- Trinity College: $42,370; with room and board, $53,330; an increase of 3.7%; in 2013, $59,860.

Balanced against the rising cost of education are notable gifts by generous donors to establish scholarship funds. Following donations of $40 million in 2000 to the St. Louis Symphony, and $30 million in 2002 to the Missouri Botanical Garden, the Taylor family (Enterprise Holdings) gave $25 million in 2011 to Washington University to establish scholarships for needy students.[46] Among the questions still unanswered, however, are what percentage of American families can afford the current cost of education, and, with that percentage going down, what will be the long-term effect on the nation's overall well-being?

The Organization for Economic Cooperation and Development (OECD)

reports that Canada, Finland, Ireland, Japan, Korea, and The Netherlands now educate more of their population than does the United States, which graduates 33% of its population from college, and that Australia, Belgium, France, Norway, Spain, Sweden, and the United Kingdom will soon surpass the United States (Economist, 2011d). This will move us down from 1st place to 12th place for percent of college graduates among industrial nations at a time when the need for high intellectual ability and a global perspective is growing. In a summary of these trends compiled for 29 democratic countries entitled "Going backwards: US falls behind in college graduate rate" in the *Boston Globe* (Abel, 2000: 4) and elsewhere, it was noted that,

> the United States no longer leads the world in the proportion of students who graduate from college, the first time since such international statistics have been compiled. Compared to the 3 percent increase in the United States, for example, the graduation rate in Britain rose from below 20 percent in the early 1990s to its current 35 percent. In the Netherlands, 34.6 percent of the student population graduate from college, and in Norway the figure has risen to 37.1 percent. One of the reasons the United States has fallen behind . . . is because the country has lagged in improving its pre-university education system. Furthermore, the United States pays teachers less per capita than all but three of the countries surveyed and teachers work annually 300 hours more than the [OECD's] average.

Other qualities, like the nation's physical health (nutrition, fitness), reflect, in part, self-discipline, parental guidance, corporate responsibility, political leadership, and education. The national health is revealed, for example, by the trend in childhood and teenage obesity. The obesity rate is currently 17.1% of those between the ages of 2 and 19, or 9 million young, which is triple the rate in 1980.[47] Among adults between 20 and 74, 32.9% were overweight in 2003–2004, compared to 15% in 1980. The year 2005 marked the first time in two centuries that those in the current generation could anticipate a shorter life expectancy than their parents (Belluck, 2005). In 2010, there were over 600 million new cases of diabetes diagnosed worldwide—or one every second—mostly due to obesity, and between 20% and 30% of present-day schoolchildren will develop diabetes owing to diet-related causes. An informative summary of these trends and their causes is David Kessler's (2009) *The End of Overeating: Taking Control of the Insatiable American Appetite*. At issue is, not a blind "my country right or wrong" pseudopatriotism, but a concern for what appears to be a real decline in the quality of American life. Surveys like those noted above

are important because facing reality, rather than distorting reality, is an essential first step in finding solutions. Of course, we may ignore the trends at least to the extent of insisting on effective change, or meaningful improvement may be blocked by political, economic, and religious factions or by individuals refusing to take responsibility for their own actions.

Perhaps today the majority of those born since the 1970s, and those who have little interest in history, are not aware of any imperceptible notching down in the quality of life during their generation. However, a growing number of observers with a longer perspective believe there has been a decline and that the causes need to be addressed. A minority is being forced by a knowledge of history to conclude that in view of the massive, coordinated, and disciplined efforts required to reverse these trends—and the enormous rewards to some individuals, businesses, and professions for not doing so—we have reached gridlock, we will not address the causes, and we will continue to see, hear, feel, and count the results. An even smaller minority is expressing the belief that America has had its day in the sun. An Orwellian exercise is to try and envision what America will be like in 25 years if current trends in population growth, the environment, politics, religion, education, science, and our standing in the world of nations continue. Among the realities in a rapidly changing world are, for example, that Muslims now constitute about 20% of the global population, or 1.5 billion people, and that Latin America is "nobody's backyard anymore" (Economist, 2010c). Some will say that the America of the future will not be much different from that of the present—a bit more degraded, intolerant, and defensive. Others speculate that opportunists and ideologues pandering to the concerns of a population inadequately educated, and creating a stalemate to virtually everything proposed by the political opposition, are inexorably bringing about internally what external extremists have been unable to do. History has shown repeatedly that the young, including students like those at Kent State, will be in the vanguard of change. Consequently, how their values and attitudes are being shaped is of preeminent importance.

Collective Bargaining

A colleague once told me he believed that although professors may be respected for their learning and efforts to educate the young, mostly they are not placed in the same professional league as lawyers and doctors because, apparently, that is the way they regard themselves. Many do not dress as professionally in the workplace, especially so in recent times, they do not command the same salaries, they have not bothered to organize into a strong and influential union as have the other professions, and there is little effective lobbying on behalf of higher public education. Rather, they seem content to discuss rather than to act, to accept rather than insist, and as a group they are often viewed by the public as wandering about in the rarified halls of the ivory tower, detached from the power centers of the real world. That image is no doubt painted with too broad a

brush, but it is a common perception, especially for professors at the mid-echelon schools. For all the conferences, resolutions, efforts at persuasion, theoretically sound arguments, murmurs of assent by politicians, and decades of promises, education remains on the back burner and has been in decline in America for years. In the high school grades, for example, in 2008 it was not unusual for half the ninth graders in inner-city public schools to fail to graduate and for two-thirds of those who did graduate to be far behind the national average in math and reading skills.[48] As noted, 7,000 students per day drop out of high school, adding to the guesstimated 85% of the overall population that are getting fed up with the perceived excesses of the other 15%, and they are more susceptible to appeals from alternative religious and political groups, or at least are more understanding of those drawn in that direction. In many schools there are 17-year-old eighth graders reading at a fourth grade level, and in one school in New Orleans only 8 out of 108 students passed a standardized proficiency test. Incredibly, 47% of adults in inner-city Detroit are functionally illiterate, and only 25% of high school freshmen graduate (Sullivan, 2009). In the inner city of Philadelphia in 2009 there was a 50% drop-out rate, and 22% of the adults are functionally illiterate (Week, 2011). If these conditions are perpetuated by political leaders who take no effective action, and by citizens who do not insist they do, then an oversupply of expendable, powerless, low-paid, unskilled workers continually flows into society. As noted in Chapter 9, in 2009 unemployment among teenagers was 24%, and among black males it was 50%, adding to an increasingly disillusioned population. The ultraliberal—who refuses to acknowledge that behavior is in part the responsibility of the individual and that not every person is a "victim of society"—and the ultraconservative—who pretends that people's problems other than his own can be solved without government intervention "if they would only try"—are both putting the country at risk by stymieing efforts to achieve a workable balance.

There are heroic efforts being made to improve the literacy, technical skills, and reasoning powers of the ever-growing disadvantaged sector of our population. The Gary and Jerri-Ann Jacobs High Tech High Charter School in San Diego has faced the reality of the undereducated and growing immigrant population in America (PBS NewsHour, 2008; Christie, 2009). The importance of this population may not be apparent or of much concern to those whose interests center on the boardroom, faculty club, or laboratory, but out there in real life it is an increasingly obvious and important problem. Today 47% of children under the age of five are from minority families.[49] Depending on how they are cared for by family and society, they represent either a great resource or an enormous problem. At the High Tech High Charter schools in San Diego

and Chula Vista, California, which specialize in math, science, and engineering, the approach is to use team-organized, project-oriented instruction to improve the lot of primarily Hispanic immigrants (Caravantes, 2006). Although legal Mexican immigrants now make up 14% of the U.S. population, and nearly one half of the population growth, only 1 of 16 completes college. This compares to 1 to 3 for Americans overall. The 94% who do not complete college are added to the U.S. population each year. A popular T-shirt among students at High Tech High asks "Who Cares?" Prominent individuals who do care have lent support by visiting the school, talking with the students, and helping in other ways; they include Senator Joe Lieberman, Peter Yarrow of Peter, Paul, and Mary fame, Arnold Schwarzenegger, Oprah Winfrey, Kathleen Kennedy Townsend, and Bill Gates. Usually at the end of four years, 100% of the graduates at High Tech High are admitted to college, and about 80% go to four-year institutions, including Johns Hopkins, MIT, Stanford, and the University of California, Berkeley. About 30% enter math or science fields, compared to the national average of about 17% (PBS NewsHour, 2008). This is important at this particular time in our history because, as Kaplan (2010) writes in his article, "Where are all the science majors?" (1) Nationwide Insurance had to bring in an entire level of computer scientists from India because not enough were available locally in Ohio, (2) the number of degrees awarded to U.S. citizens in computer science between 2004 and 2007 declined by 27% according to the latest figures from the National Science Board, (3) for every 50 students graduating with MBAs and 18 with law degrees, one graduates in the physical sciences, (4) 50% of those with science degrees end up in fields other than science, (5) among college students who begin as STEM (science, technology, engineering, and math) majors, only half complete their respective programs, and (6) nearly 60% of current U.S. workers with STEM degrees are over 45 years old. (Kaplan cited data from the Aerospace Industries Association, the Business-Higher Education Forum, and the ACT Testing Service). Success like that at High Tech High is being achieved at Urban Prep Academies in Chicago, which serves primarily inner-city black males. In 2012, 100% of the graduates entered college.[50] Techbridge in the rough inner city of Oakland, California, emphasizes science, technology, and engineering for girls and was featured on the *PBS NewsHour* (2011b). edX is a project of Harvard and MIT. Each contributed $30 million, and 29 institutions are now participating including Texas, Berkeley, Cal Tech, Cornell, Rice, and others such as the Australian National University, Technical University Munich, and schools in China and India.[51]

High Tech High, Urban Prep, Techbridge, and similar schools, with their supporters, teachers, administrators, staff, parents, and students, are one of the many things that are "right with America." But private, charter, and experimental

schools so beneficial to a small segment of the population are not the exclusive answer to the broader problem of the nation's educational health because their graduates will continue to be overwhelmed numerically, and at an ever-increasing rate, by those who do not graduate from any school. Both public and private schools have a place, and both are essential, but the one that educates the most students is in decline and requires significantly better support. Unemployment among college graduates is half that of those with only high school degrees, and pay is about double.

In light of the current economic crisis, the budgetary requirements for fixing inner-city public schools may be increasingly regarded by some as not cost-effective. Many schools and classrooms have been allowed to deteriorate to the point of being minislums, and despite heroic efforts by many teachers, graduation rates and student preparation as noted above is often abysmal. It is worth speculating whether there is creeping into the political psyche a subliminal acceptance that free elementary and secondary public education in tax-based poor inner cities is on the way out and that tuition- and donor-financed private and charter schools are the welcomed alternative for financially strapped governments. In the virtual certainty that such a system will add even more youths to the undereducated and ill-prepared population, it is a slippery path into unknown realms.

The conclusion seems inescapable that improvement in American education is needed. In my experience in the general biology course at Kent State over a 38-year period between 1964 and 2002, were it not for the influx of foreign students, mostly Asian pre-med majors, the overall quality of the classes would have declined even more. If higher education consists of a student body that traditionally has not voted, and a faculty that is not organized, its low standing in the modern political scheme is preordained. The dramatic increase in young people participating in the 2008 election is a hopeful sign. As noted previously, in this day and age a profession and a nation will probably get what its constituents work to attain.

Regarding collective bargaining by university faculty, the freedom to pursue knowledge unfettered by assigned research, convey that knowledge to others without undue concern for its popularity, and to do this in the stimulating and often refined environment of a college campus has great appeal. There is another rarely discussed but nonetheless significant advantage to university employment looming ever larger in the current economic climate. After seven to nine years of acceptable performance, tenure is usually attained, and then the question becomes more complicated: what is the added financial value of having guaranteed employment for life with benefits? When Alan Shaw visited Harvard with an offer to work for Amoco—a company with world-class laboratories,

almost unlimited support for commercially relevant projects, and a much higher salary than offered by most universities—it was a tempting offer. To put a dollar amount on these two opportunities, beginning nine-month salaries at Kent State in 1964 were around $8500. Summer income was not guaranteed (one-sixth of the academic year salary for one summer session every other year), but if available, the annual salary would have been $9200. The offer from Amoco in 1962 was $24,000, or nearly triple the salary from Kent.

However, many years later, the methods used in the petroleum industry to explore for oil changed from primarily paleontology to seismic stratigraphy. As a result, hundreds of people were let go at what had to be the worst possible time in their lives. In mid- to late-career they were too old to get other employment, especially in a dwindling market, and they were in the midst of the usual financial commitments of mortgages and college educations. Furthermore, they were vulnerable because even with extensive experience and documented productivity, more recently trained graduates were available at a lower cost. A friend called one day to ask if there were any students at Kent State interested in one of the several openings in his company. A few months later he called to ask if there were any positions available for him at the university. The end could be swift, sudden, and rather brutal. One colleague in the oil industry told me of sitting in his office when security personnel unexpectedly entered, locked his desk and filing cabinets, took his keys and identification badge, and escorted him off the premises with instructions to return the next morning. The abruptness of the procedure was due to the fact that data generated by scientists in industry often have proprietary value. He was kept on the payroll for a month and was given severance pay, assistance in seeking other employment, and advice about possible consulting opportunities, but the die was cast, and he was through. So, again, the question is, what is the additive value in dollar amounts of guaranteed employment for life with benefits? By any measurement, it is substantial (see Isidore, 2010b). For many who make the cut and gain tenure, university life is enjoyable and rewarding. In a recent survey, college professor ranks three on the list of Best Jobs in America (behind systems engineer and physician assistant; CNN Money, 2009). Menand (2010: 13) calls the university the marketplace of ideas and notes that "the pursuit, production, dissemination, application, and preservation of knowledge are the central activities of a civilization" and that "the ability to create knowledge and put it to use is *the* adaptive characteristic of humans." Obviously, for faculty having gained tenure the governance structure and education philosophy of universities is not something to be tampered with lightly, and one kind of tampering is collective bargaining. As Colin Macilwain (2011: 497) expresses it, "from the point of view of the scientist at the bench,

grants continue to flow and results continue to be published. Perhaps this is why wider discourse about science's role in society [and society's role in science] has hardly budged an inch." Another hurdle is the inherent conservative nature of university faculty regarding the way things are done. Cole notes that, "paradoxically, individual university faculty members tend to be liberal, but when they are brought together to discuss education reform, they become highly conservative" (Cole, 2009: 196). Cornford (1908: 15) captured the sentiment satirically by cautioning new academics that "nothing should ever be done for the first time."

For other university faculty, however, the low priority accorded education in America is unacceptable as a matter of principle. For still others, local situations demand improvement in governance that has not been achieved by asking, hoping, and passively accepting the results. For the latter group—who are also deeply interested in service, administration, teaching, research, and the academic welfare of students, and who have concerns about instances of administrative incompetence and abuse—change is considered achievable only through a unified group supported by a national organization. However, the basis for making the decision to unionize is not at all clear and simple. The widely publicized corruption in some trade unions has created a broad-brush image problem. Also, the needs of America's colleges and universities—increased support for higher education, a greater faculty role in formulating policy, and salaries competitive with other professions—are not the same everywhere, and at any given place they can improve or deteriorate over time. Thus, a consensus about the value of unions at the university level has not been reached. On the broader issues, however, like improving the status and raising the priority of public higher education at the national level, it is clear that reliance on hope, good luck, and the foresightedness of political leaders for the past half century has not worked. Even for those in higher education who are "doing alright" and will be retired before things get perceptibly better or worse, there is still the issue of professional responsibility. So it comes down to whether enough academics are sufficiently concerned about the decline in a fundamentally important component of America's strength to do anything about it, whether unionization is the way to go, and, if not, whether there are any viable alternatives other than those that have failed for the past 50 years. It is telling that elementary and secondary school teachers have been organized into unions for quite a long time through the National Education Association (NEA, established in 1857; 3.2 million members) and the American Federation of Teachers (AFT, established in 1916; 1.4 million members) and that there has been improvement in the area of their greatest need, namely, a livable income. Many elementary and secondary school teachers during my days in

school had to paint houses or lay carpet to subsist on the entry salary of $6,000 per year or less, and others were forced to leave and take jobs in industry. Many bright students, including my own three children, never even considered teaching because of pay, working conditions, and public attitudes. University professors have been less organized for a shorter time and they have made fewer gains in their areas of greatest concerns—governance, support for higher education, and more competitive salaries (in that order; see below). At elementary, secondary, and college levels, however, overall support for education in America has declined in relation to the cost of educating. The procedure of balancing budgets on the back of a nation's education system is reminiscent of what Jill Lepore (2010) said in a recent *New Yorker* article about neuros (cryogenically preserved human heads)—it's extremely optimistic cosmetic surgery. Joint effort between all members of the education community to improve the situation will be required, and this, in turn, probably means an especially greater commitment to collective bargaining by university faculty. Of course, it may never happen. Traditional unions have been on the decline in the United States from the threat of job loss until recent reversals in Ohio and Wisconsin. Other forms of collective action are blazingly evident elsewhere in the world, however, for those perceptive enough to see the implication of long-term neglect. Civilizations, nations, and political systems rise and fall, and, as noted, a profession, like a country, will get what its members work to achieve.

The need for organized reaction to perceived injustices by management was recognized early in America with various compacts (e.g., the Mayflower Compact, for creating just and equal laws, in 1620), town meetings (New England town meetings, starting in 1620), and guilds, societies, and auxiliaries (e.g., the Daughters of Liberty, organized as an auxiliary of the Sons of Liberty in 1765). During the tumultuous times of the Revolutionary War, the Civil War, and the Industrial Revolution, between 1776 and 1913, there were prototypes of unions such as the New York Journeymen Printers (1778) and the Printers of Philadelphia (1786). The first strike by women was by weavers in 1824 in Rhode Island to protest lowered wages that were coupled with longer working hours. From these groups evolved modern unions representing a diversity of workers. Events leading to collective bargaining as it relates to education include the following:[52]

- The National Education Association is founded in 1857, and in 1966 it joins with the American Teachers Association; its present membership is 3.2 million.
- The American Federation of Labor is formed in Columbus, Ohio (1886).
- The Department of Commerce and Labor is formed (1903).

- The Department of Labor is established (1913).
- The American Association of University Professors (AAUP) is founded (1915).
- The American Federation of Teachers is formed (1916) and is presently affiliated with the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO).
- The National Labor Relations Act protects the right of workers to organize for collective bargaining (1935).
- The AFL and CIO unite, bringing together about 85% of union members into one Organization (1955).
- Federal employees are given the right to collective bargaining by executive order of President Kennedy (1962).
- Washington State becomes the first state to allow unions for civil service employees (1973).
- The AFL-CIO creates a department of public employees (1974).
- The AAUP is first recognized as the bargaining agent at Boston University (1979).

The need for a faculty senate with an attitude, or some augmenting support group, was apparent at Kent State University, as it was elsewhere (see Cole, 2009: 351–354). The shenanigans of the Olds administration (see Chapter 7) served as the final straw for many faculty concerned with equable governance procedures. It was clear to all but those benefiting from close association with an administration focused on self-interest and public imagery that it was an unacceptable situation that was only getting worse. The question was whether enough faculty members were willing to make the effort and would have the stamina to withstand the pressures of the early stages of unionization. These efforts initially would have to be made by a few activists on behalf of everyone—including those opposed on the basis of sincere reasons of principles and philosophy and those who just sat out because of apprehension or apathy. The incalculable amount of time required had to be contributed initially without compensation and without reduction in service, administration, teaching, or research expectations. There were the anticipated innuendos of dire consequences for early supporters of collective bargaining, but federal laws offered at least theoretical protection, although enforcement waxed and waned with different administrations. These were mostly idle threats issued with the hope that resolve would fade, and for some it did. However, considering how many administrators got to where they were at Kent in the 1970s by the longevity-default mode (see Chapter 5), their proclamations were not particularly impressive. The brunt of the pressure was

borne by early organizers like Ed Bixenstine (Psychology; union president), Harold Kitner (Art; chief negotiator), Ken Calkins (History), and others. Their steady, confident perseverance is the basis for the current success of the union at Kent State. There was not much chance of serious harassment of individuals because other universities were on the verge of unionizing, or had already done so, and it was a trend being widely covered in the press. Federal labor laws were being enforced to some extent during the Carter Administration (1977–1981), and education unions were becoming more experienced and sophisticated in tactics. Votes of no confidence in university presidents carried (and carry) weight because professors are not regarded by the public as radical extremists, and collective bargaining at the university level was beginning to work. The sympathy of working families, many of whom belonged to unions, has always been strong for faculty, and it is increasing as salary packages for administrators are announced. Among universities in 2006–2007, David Sargent at Suffolk University in Boston received a pay package worth $2.8 million. In 2009, E. Gordon Gee of Ohio State was the highest paid public university president at $1.6 million, followed by Mark Emmert (University of Washington; $900,000) and Patrick Harker (University of Delaware, $810,000), according to a *Chronicle of Higher Education* survey (cited by Rooney, 2010b). Donald Ross at Lynn University held the 2003–2004 private school record at $5,042,315. Both administrative salaries and college tuitions across the country continue to escalate (Pond, 2005; Janofsky, 2005; Chronicle of Higher Education, 2007; Graff, 2007).

To stem faculty interest in collective bargaining, university presidents and administrators, instead of harassing individuals, made pronouncements that were aimed mostly at the uncommitted, predicting the end of education as we know it if unions came to the campus: faculty would be punching time clocks; University of Wisconsin vice president Donald Percy in 1972 ranted it would end the academic autonomy of state universities and that unions would be negotiating directly with state legislatures. Michigan State University president Clifton R. Wharton railed that unionization would drastically alter the traditional cooperation between faculty and administration (faculty at many universities must have smiled at that) and replace it with an impersonal and adversarial labor–management relationship (Time, 1972). With the benefit now of 40 years of hindsight, none of this happened.

The faculty at Kent State University organized as the United Faculty Professional Association (UFPA) and voted for collective bargaining in 1975. The first contract was signed in September 1978. An early task was to choose among the several unions representing higher education. The affiliation of the American Federation of Teachers with the AFL-CIO was a concern, and the

National Education Association was viewed as most experienced in representing elementary and secondary school teachers. The choice was the American Association of University Professors (AAUP), and the relationship has worked well for 35 years.[53]

Once in place, a last-straw objection to unionization by critics at Kent was that the focus would be on salaries at the expense of academic excellence. My early role in the UFPA was as a negotiator on the team headed by Robert Dahl (Philosophy), and the first item on our agenda was not salary, but increasing the budget for the library that for years had been in decline. That increase was achieved, and the library now ranks among the 75 top research libraries in the country. Another concern was that a union would change the faculty–administration dynamics into an adversarial stalemate. That did not happen either, and the bargaining sessions were civil and followed the early routine of (1) the administration offering nothing or proposing reductions, (2) our asking for everything in some order of priority that defined the agenda, and (3) compromising on something acceptable to both sides. After one preliminary session, the university president said to me half jokingly, "Keep this up and you may not be here much longer." I said to him half jokingly, "I'll probably be here longer than you." After such posturing, both sides got down to the real business of improving things for the university. During one year's negotiation, I was teaching a seminar in tropical biology, a delightful member of which was Monica Schwartz, daughter of university president Michael Schwartz. I announced in class one night that the library would be closed for a month because it was discovered that administrators could not operate the recently installed, warmth-sensitive elevator buttons. Several days later, I passed Michael Schwartz on the sidewalk, and he whispered, "I can too operate the elevator."

Another concern was that the union would perpetuate mediocrity by protecting incompetency. That issue is frequently raised with regard to elementary and secondary education, for example: "The government has billions to spend on public education, but teacher's unions are standing in the way. In New York, it is near impossible to fire a teacher—even one accused of a crime, drug addiction or flagrant misbehavior" (Klein, 2010: 20). It is undoubtedly true that trade unions traditionally have suffered from corruption, patronage, and unreasonable demands during times of economic slowdown and that teachers' unions have traditionally suffered from perpetuating mediocrity. The failure to acknowledge and correct these deficiencies constitutes a valid criticism of unions.

On the other hand, another exercise with Orwellian overtones is to project the current trend in union busting of state employees and other workers into the next 25 years. If essentially all decision-making power is placed in the hands

of management, is it likely that it will be to the benefit or to the detriment of workers, and will it likely be to the advantage or disadvantage of management? Assessing quality is an inexact science, but in higher education several means exist for measuring performance and for identifying abuses on either side, as do humane ways for dealing with sensitive issues such as nontenure (see below).

In addition to last-resort efforts, such as strikes and votes of no confidence, university unions have more subtle ways of presenting their case, and some are quite effective. The board of trustees and the president of Kent State met each semester for an hour in open session in the governance chambers of the student union. During one session, Kent AAUP president Ed Bixenstine asked to say a few words but, as anticipated, he was refused because a written request had not been submitted beforehand. The board and the president must have been somewhat nervous because Olds was already under siege from a variety of allegations, and many board members were executives of companies that cared little for controversy and less for association with a university president often being portrayed negatively in the press. Bixenstine asked that those interested in hearing what he had to say adjourn into the hall. Virtually the entire audience exited, and the board and the president were left, literally and figuratively, sitting alone in a nearly empty chamber while cameras of the student newspaper and local press documented their predicament.

My role as chairman of the Grievance Committee for the union at Kent State was a moving experience as faculty, often with their backs against the wall, looked to the UFPA for support. Some called for appointments during the day, but for those with deep personal concerns, calls or visits during the evening at home provided a more relaxed venue for unloading anger and frustrations. Sometimes that was all that was needed. The visits and calls would start around 8:00 P.M. and sometimes continued until after midnight. Many were from those who had not been given tenure, and this is always a serious matter, as witnessed by the extreme instance of the tragic shooting of three faculty members at the University of Alabama, Huntsville on 13 February 2010 by a disillusioned colleague who had been voted no tenure (Wadman, 2010).

One source of information about academic performance was from peers in the same department. In addition, there were several years of student evaluations and a written record of publications, papers presented, membership and participation in professional societies, awards, honors, training, and experience. The law of survival in the workplace is (1) assume nothing, (2) get it in writing, and (3) keep it organized. If the person could not provide sufficient evidence for vigorously presenting a convincing case, they were so informed. If they were still adamant about filing a grievance, they were told to assemble the relevant

documents, prepare a written summary objectively detailing the strengths and weaknesses of their case, and the case against them, think it over for a few days, and if they decided to go forward we would help as best we could. Many chose not to pursue the matter further.

However, others had been subjected to blatantly unfair treatment where it was clear that tenure had been denied because of prejudice, vindictiveness, or animosity. The reasons often came through as nebulous judgments about abrasive personalities that were disruptive to the department, reflected jealously by an old guard apprehensive about competing with a new colleague, or were vague pseudoreasons given by those just going along with the others. Either way, the motives were usually transparent, and the conclusions difficult to convincingly document. The chairman and the department's executive committee always had to prepare written justification of their decision, but the difference now was that the dean or provost could not arbitrarily side with the chairman without fear of challenge. It soon became clear that the administration was actually appreciative of the data amassed and was generally supportive of the union's recommendations because they tended to head off possible legal action by faculty with strong cases. Any faculty member sufficiently interested in students to withstand the rigors of early collective bargaining was not likely to perpetuate ineptness by supporting clearly unqualified colleagues. Similarly, faculty willing to undergo the pressures of early unionization were not likely to pale in the face of weakly documented political or personal reasons for denying tenure. In cases that were not clear, the candidate was notified of the concerns, and often a recommendation made for a one-year extension so that credentials could be strengthened or the case could become otherwise clearer.

The gradual evolution of cooperation between the union and the administration was demonstrated by a situation involving a professor in the Psychology Department at Kent. He was missing classes and clearly was not in good health. It turned out he was dying from complications associated with acute alcoholism. Both sides agreed that students should not pay the price of his illness, but at the same time they agreed that the most humane course should be followed. Medical records showed the patient was indeed terminally ill and would not live much longer, perhaps only a few months. I discussed this with my administration counterpart, Tom Moore, and we agreed the faculty member should be placed on leave for the remaining month of the spring semester. He died during the summer, and his family expressed gratitude that a thoughtful solution had been found to a difficult problem during a trying time. This approach was in contrast to a pronouncement by a pugnacious dean on another matter that "I can't run this college on a humanitarian basis"—a blackbird with a degree

and the title of dean. The fact was that he did not know how to run an academic college on a humanitarian basis, but it could be done.

The most unique request for assistance came from a faculty member who said that a burly trucker had come into his office, laid a gun on the desk, and said, "go for it." After some threatening remarks and animated discussion, it turned out the trucker's girlfriend had received a failing grade in the course and, to get even, she told him the teacher had made a pass at her. Her champion threatened to return, and the faculty member wanted to know what to do—a situation calling for careful thought. After consulting with others, including members of the Psychology Department, the consensus was that I should alert the campus police and, because the encounter probably had achieved the desired effect, recommend a direct course of action—call the man, explain what had happened, and apologize for any misunderstanding. This was done, the trucker said, "that's funny as hell," and the matter was ended.

So what has been the result of 35 years of collective bargaining at Kent State University?

> Today, as a result of that choice, KSU has a strong tradition of shared faculty governance that rivals any university in the country. Having served in upper levels of the University administration for so many years, I saw first-hand how easily an administration—even a well-intentioned one—can lose sight of the faculty and student perspective in setting the direction of the institution. Rather than being destructive of the academic traditions of shared faculty governance, the Association worked with the Faculty Senate and has succeeded in ensuring a continued strong role for the Faculty Senate in the governance structure at KSU. Working with the Federal Mediation and Conciliation Service, the University and the Association agreed to adopt a less adversarial approach to collective bargaining called *modified traditional bargaining*. Faculty rights . . . are now specified within the Faculty Senate Charter and By Laws, and guaranteed in our Collective Bargaining Agreement" (Cheryl Casper, chair of the Faculty Senate; chief negotiator, 1999, and president, 2002–2006, of UFPA; and professor of economics).[54]

The intent of choosing collective bargaining was not to administer the university but to ensure meaningful dialogue and monitor the administration through a responsible organization that could muster leverage if necessary. On the cover jacket of Menand's (2010) book, *The Marketplace of Ideas, Reform and Resistance in the American University*, the question is asked, "Why are so many problems that should be easy for universities to solve—problems that

are mainly about ideas, not money—so intractable?" Perhaps one reason is because university faculty are not organized into a national body that can focus its collective intellectual energies on identifying and prioritizing issues critical to higher education and then exert the pressure necessary to bring about change. It is clear that when social trends or legislation of interest to the legal or medical professions are in the offering, the American Bar Association and the American Medical Association closely monitor them to ensure that their members are not adversely affected. Thus far, no comparable activism or effective monitoring exists in higher education.

At the outset in 1975 only a small minority of the faculty joined the United Faculty Professional Association at Kent State, and during my involvement (1977–2002) the ever-elusive goal was to gain a 50% membership. Today 611 of the 854 full-time tenured faculty (71.5%) and 198 of the 311 full-time nontenured faculty (63.6%) are members. The trend is on the rise, and the current membership is the highest in the history of the union. The activist members of the Kent State University faculty demonstrated a concern for excellence in service, administration, teaching, and research and were further willing to work for it. At the national level the potential for future gains is there, with over 5,700 colleges and universities in America, 11 million students, and more than 1 million faculty members (National Center for Education Statistics, U.S. Census Bureau; Carnegie Foundation for the Advancement of Teaching[55]). It remains to be seen if current and future generations of faculty opt for collective involvement at the national level to force lasting improvements in America's system of higher education. One thing is clear—it won't be bestowed as a gift.

Discrimination

Shirley A. Graham and the Department of Health, Education & Welfare vs. Kent State University, Case no. 0545740717, 24 October 1974.

In recounting the effects of an act of discrimination as a strand in the academic tapestry, it is important to recognize that supporters, however close their involvement, can offer only a partial picture of the frustrations and the inner strength required by the principals to endure the experience. Also, particularly important for family members, and regardless of the depth of their support, they must remain just that—supporters—and not interfere with the decision-making process of the legal advisors. This can be difficult because the motivations of those causing the situation are encountered on a daily basis; and this was especially blatant in the early stages of this case in the 1970s when a successful outcome seemed improbable. The wife of one departmental administrator gossiped that she was "trying to take food out of the mouths of our family," and, in response

to a letter of 12 July 1978 to then vice president and provost Michael Schwartz requesting that some reprints and an updated vita be passed on to President Golding, Schwartz wrote, "I am returning the reprints you sent to me recently. Should you wish Dr. Golding to see these materials, you should send them to him directly."

The one female long-term faculty member in the biology department, Dorcas Anderson, was quickly promoted to full professor after the suit was filed, and when a position opened for a zoologist, the chairman ruled against the candidate recommended by the faculty and hired a woman with less convincing credentials because, he said, "it has to be a woman, and you know why." Pressures were cited from the Office of Civil Rights (OCR) and Health, Education, and Welfare (HEW) for overruling the faculty decision but no such pressures were cited when considering Shirley's application. After a summer of unsuccessfully attempting to communicate in writing with the chairman about teaching opportunities for the fall of 1974, she finally encountered him in the hallway on the first day of classes. He incorrectly said that her application for the advertised temporary, part-time position was received too late (although no deadline was mentioned in the advertisement), while two other unadvertised openings were filled with persons holding master's degrees from Kent State, one of whom had been refused admittance to the doctoral program for lack of qualifications. Another reason given for not hiring her was an alleged decline in enrollment for those courses she was qualified to teach. Documents secured from the Registrar's Office showed that enrollment in one course stayed the same, two had increased, and the two extra people had been hired to teach those sections. Shirley was told to vacate her office and that "you can pursue your hobby in your husband's quarters." The pettiness of such personal statements only strengthened resolve because it demonstrated the ineptness of the opposition and the corruption of the process.

Also aggravating was the indifference of some administrators to the interests of the individual and the institution as their insecurely anchored authority was challenged; the delays that forestalled arriving at a settlement; the immense complexity of the federal system; and the real possibility that however strong the case may be in the legal sense, it could still fail because the procedure was not always fair. But if the case was just and the participant was able to stay the course, support groups could work to keep it alive and continue focusing light on the facts. The side with a just cause welcomes that light, and the side that does not continually has to support itself with weak, evasive, and unconvincing arguments. They may still win, but defending becomes more difficult, and slowly a justifiable case kept in the public eye becomes a greater embarrassment because

of the publicity, mounting expenses, and the increasingly obvious lack of fairness.

If resisting collective bargaining revealed weaknesses in the ethical armor of some Kent State administrators, their record in the area of women's rights in the 1970s was deplorable. To support that conclusion, it is noted here at the outset that the university was found in violation of Title IX and Executive Order 11246 of the Department of Health, Education, and Welfare (HEW) as early as November 1976; that decision was upheld again on 4 February 1977; a Labor Department official called it one of the most blatant cases of discrimination he had seen outside the Deep South, and the case was sent to an administrative law judge for enforcement. Yet the administrators in charge continued to refuse to comply with the federal rulings. This must have been difficult for fringe-element conservatives because it was their own federal government that found for a working woman against the establishment. It creates the *argumentum absurdum* for extreme elements advocating the right to support regulations they deem worthy and ignore those they feel do not measure up, while portraying negatively someone else who is also contesting the ways of the establishment.

Setbacks along the way were numerous. A charge of discrimination was filed with the Ohio Civil Rights Commission (OCRC) on 13 February 1975. After three years, in January 1978, the OCRC responded that because they had delayed pursuing the case (along with about 200 others), deadlines had passed and all investigations were being suspended. At the federal level, after four years and about midway through the proceedings in 1978, jurisdiction for gender discrimination was changed from HEW to the Labor Department (Office of Federal Contract Compliance; OFCC) with the requirement that all complaints be refiled and start from the beginning. Perhaps most ironic was that the "lawyer in the Office of Federal Contract Compliance who wrote the administrative complaint for our case and found it worthy of enforcement . . . has now been reassigned to defend the OFCC against the contempt-of-court charges brought by the Women's Equity Action League (WEAL) for the Office's failure to comply with court-ordered enforcement of the laws" (letter from Shirley Graham to Senator Howard Metzenbaum, 10 November 1981).

What was it they were fighting? Enormous obstacles were being placed before women in the 1960s and 1970s in their effort to attain equal opportunity in the workplace. This often resulted in a natural selection process by which only the strong, aggressive, defiant, vocal, and sometimes abrasive could survive. Such traits in men are considered assets, and they are called "macho," while women with such characteristics were called "difficult," "disruptive," and "unwilling to be team players." Such labels are mostly irrelevant to qualifications for teaching and research, but in real life being acted out with real people, unexpected

machismo among women did impose a further obstacle. In Shirley's case this was not an issue, and even at the lowest point of the case, insinuations of unprofessional behavior or of being a difficult person were never raised. Ironically, what was being resisted by a group at a university sorely lacking in national reputation, grant procurements, publications, and, often, skilled teaching—was a genteel and capable woman with a Ph.D. from the University of Michigan, a postdoc from Harvard and a Fulbright Scholar, who was asking for departmentally defined, part-time or full-time teaching; a level of professional respect normal to any institution; and the chance to compete if a tenure-track opening became available. This, the department chairman could not bring himself to do, the dean of the College of Arts and Sciences agreed, and three presidents at Kent State gave tacit approval through inaction. Instead, she was informed of the possibility of teaching in the freshman biology laboratories, when, if, and how much, on the day before classes began, at graduate student hourly rates, and assigned space in a dusty storeroom. There was no expectation that even these conditions of employment would be continued. Most relevant to the legal issues as they were evolving at the time was that she was kept in this situation for most of 10 years and was still called temporary. This was a situation not unlike that of Ruth Kelly, another woman in the department, who was classified as temporary for over 20 years—longer than most who had permanent positions in the department. The federal government said this was wrong.

What was at risk?

> I wish to advise you that the Chicago OCR recently referred the case to the Regional Attorney's office with a recommendation for enforcement action pursuant to the nondiscrimination provisions of Title IX of the Education Amendments of 1972 and Executive Order 11246, as amended. (Letter to Senator Howard Metzenbaum from David Tatel, Director, Office for Civil Rights, 17 November 1977).

The stakes for Kent State were high because, if the case had been brought to enforcement—as the government informed them in writing it was ready to do—Kent State would have lost all federal funding and faced another national embarrassment only four years after the shootings. Clear signs of change were in the air and were being widely reported (e.g., Chronicle of Higher Education, 1977). In February 1975, HEW Secretary Joseph Califano, Jr. had announced that federal funds would be cut off to any school found in violation of federal laws against race or sex bias. While the proceedings at Kent were in progress, the University of Georgia was ordered to pay three million dollars to a woman

discriminated against in the Physical Education Department. Margaret Cussler in 1976 charged the University of Maryland with sex bias in denying her promotion to full professor, obtained a jury trial, and asked for $400,000 in damages. Sharon Johnson of the University of Pittsburgh's Medical School sued for $1.5 million, and in the preliminary ruling there was a provision that the school could not end her employment while the case was being litigated. A similar ruling continued the employment of Barbara White at Tufts University in 1975. This was important because a common tactic was to immediately suspend employment of the complainant until the case was settled. This could be prolonged into years, and in the absence of other income it was a telling and effective means of intimidation.

Another factor was that the average tenure of most university presidents was 7 to 9 years, so long delays would usually result in passing the problem on to someone else. Civil rights were starting to get the attention of university administrators, in part, because it involved public disclosure of how money was being spent, as well as affecting the institution's image. There was the increasing chance of fighting a protracted high-profile case then losing, and since it made the president and the board look bad, lower-level administrators were or should have been uneasy because higher-level administrators responsible for years of nonaction would surely deflect blame to the underlings. For example, an issue in the Kent case was the contention that no job was available in Shirley's area of specialization, but in the description prepared by the department, seen by the faculty, and sent to the dean, no research specialization other than botany was mentioned. The concern of lower-level administrators for their backsides was clearly justified from a comment to the *Kent Record-Courier*[56] by Tom Moore, executive assistant to the President, upon settlement of the case. He noted that the decision to hire someone other than Shirley was the decision of the department chairman, the faculty in Biological Sciences, and by implication, the dean of the College of Arts and Sciences. No mention was made of the inaction by three university presidents, and certainly nothing about the legal costs forced on taxpayers because of delay and noncompliance with a federal ruling that had been issued five years previously in 1977.

Some early optimism that the complaint ultimately might be upheld was inadvertently provided by several mid-level administrators. The dean of the College of Arts and Sciences at Kent State asked Shirley how she would handle her family responsibilities if she had a full-time job. That was in direct violation of the existing federal guidelines, and the obvious answer was presumably better than he was handling his. In a meeting with the chairman of the biological sciences department, he actually came around the desk and stood next to Shirley's chair, trying to tower ominously over her, vividly describing the hopelessness of her

case. Unfortunately, he was a short little rascal, and if this was intended as act of intimidation it was more silly than effective.

The Office of Human Resources Utilization was set up at Kent by President Glenn Olds. The assumption was that the office would interface between the faculty and administrators to resolve difficulties before they went to court. It was clear, however, that a function of the office was to ascertain the intent, strengths, and weaknesses of complaints and to pass this information on to the administration. The office was "to ensure that no person is adversely affected in any University operation,"[57] and it was charged with ensuring that the institution was in compliance with federal law. Some hint that the university was not in compliance must have been evident from the fact that 80% of part-time faculty at Kent were women, that they had no retirement or other benefits, and, as noted, that Shirley had been "temporary" for 10 years and Ruth Kelly for over 20 years. Between 1963 and 1974, there were 13 opportunities to hire faculty in the Department of Biological Sciences, and all 13 were male. A 1975–1976 salary study published and made available to the administration by Committee W of the Kent State AAUP showed that in the College of Arts and Sciences, 59% of the males at the professor rank earned more than the highest paid females at the same rank, while 78% of the males earned more than the median females at the same rank. Surely with the trend toward equality so clearly evident by results from the universities of Maryland, Georgia, Pittsburgh, Tufts, and elsewhere, these data would have caused an administration to take notice and an enlightened one to consult qualified women on the staff about implementing fair and reasonable remedies. Ignoring these manifestly obvious signs gave confidence that if this was the nature of the opposition, things might work out well after all.

What early signals did the administrators at Kent State have that they had a weak case, and one that could prove costly in many ways if prolonged by delay? Delay is always an option for administrators because they do not incur personal financial loss regardless of how many billable hours accumulate to the lawyers hired by the university; it is taxpayer, private donor, and foundation money. The case was prolonged for seven years, extending through the reigns of three university presidents. The tactics were appalling for an institution verbally committed to "seeking the truth," and eventually they failed with regard to the individual. In a broader sense, the university was successful in that it avoided addressing the issue of equable treatment of long-term but part-time employees, most of whom in the 1970s at universities were women, and many who had worked long enough to have exceeded the time required for tenure. Rather than recognizing a historic opportunity to take a leading role in addressing a high-profile problem in post–World War II America, possibly resulting in something

that might eventually be called the "Kent Model," authority had been challenged and the Department of Biological Sciences, the College of Arts and Sciences, and the University succumbed to familiar ways. The response was the "pool concept" in which work for part-timers would be limited to just under 40 hours per week so benefits and retirement would not have to be paid and hours toward seniority would not count. Also, employment could periodically be terminated then reinstated to create a basis for contending that the position was both part-time and temporary.

The problem of permanent but part-time employment with prorated benefits remains an unresolved issue today, and it is one of several concerns just below the surface that affects the attitudes of one more albeit small segment of America's population. Many individuals and organizations have worked tirelessly to level the playing field for working women and minorities. Prior to Shirley's case, most individuals working for the state of Ohio on a part-time basis received part-time retirement benefits—except part-time faculty. Following the litigation a bill passed the Ohio Legislature to include this group, and it was one of the positive results to come from the case at Kent State. However, so far there has been no effective organized resistance to the broader issue, and, other than rhetoric, there has been remarkably little action demanded by influential women and minorities who have passed through the door of opportunity opened to them by others. The claim that "we made it on our own and others can do the same" is reminiscent of the self-serving jargon of Rudy, the playground blackbird at Dow Elementary (see Chapter 1)—it suggests that something is wrong and that closure has not been achieved on another lingering category of unfairness. One thing wrong is that such attitudes are divisive. Another is that it adds to the guesstimated 85% of the population that believes things are not quite right, and, as noted, in the long-run this is not a good thing.

In addition to terminating employment of those filing complaints, another tactic is that as word circulated within the system, complainants found it difficult to get employment elsewhere. A further device was to create a feeling of isolation by barring access to offices and laboratories while the case was in court. In this particular instance, preventing Shirley's access to my office and laboratory was not attempted because such tactics would have been too brazen a statement of the petty conduct deemed acceptable, and it would have resulted in another lawsuit. So for much of the seven years, Shirley and I shared quarters, and she continued to be highly productive in research, much to the embarrassment of some administrators and some faculty in the department. During the period from prior to our arrival at Kent in 1964 and her appointment as assistant professor in 1989, including the interval of the lawsuit (1974–1982), she published 51

papers, received research grants from the Henkel Corporation of Germany and from Proctor and Gamble, received three research grants from the National Science Foundation, and served on the editorial board of the Botanical Society of America's *Plant Science Bulletin*. After 1989 she had a three-year appointment on the Systematics Advisory Panel of the National Science Foundation (1989–1992), published 58 additional papers, and received additional grants: five from the National Science Foundation (two for Undergraduate Research Experience), one from the Ohio Plant Biotechnology Consortium, two grants from the American Council of Learned Societies' Working Group on Cuba, and one from the National Geographic Society. She was elected a Fellow of the Ohio Academy of Sciences and served on the board of directors of the Ohio Plant Biotechnological Consortium, the board of directors of the American Institute of Biological Sciences, the editorial board of the Association of Industrial Crops' *Industrial Crops and Products*, and the editorial board of *Systematic Botany Monographs*. She chaired the Archives Committee of the Botanical Society of America, was appointed a member of the Finance Committee of the American Society of Plant Taxonomists, and was elected president of the American Association of Plant Taxonomists. This was the person the department, the college, the university, and some faculty members fought to keep from a faculty position in the Department of Biological Sciences at Kent State University in the 1960s and 1970s.

A counterbalance was the support of numerous individuals and organizations across the country that publicized the case, monitored the proceedings, wrote to the administrators, and published lists of resources available to women. Supporting individuals included Mary Rose Oakar, member of Congress, Ohio 20th District (letter of 5 January 1978); Howard Metzenbaum, U.S. Senate (letter of 7 March 1977); John Seiberling, U.S. House of Representatives (letter of 23 February 1977); Richard Howard, director of the Arnold Arboretum of Harvard University, who agreed to serve as an expert witness; Barbara Palser, Rutgers University and president of the Botanical Society of America; B. L. Turner, University of Texas; Alfred Sussman, dean of the Rackham School of Graduate Studies at the University of Michigan; and Richard Cowan, senior botanist, the Smithsonian Institution. Supporting organizations included the Kent UFPA (resolution of support; letter of 16 February 1977), the Association of American Colleges[58] and its Project on the Status and Education of Women (e.g., "Summary of Executive Order 11246"; Association of American Colleges, n.d.); the Women's Equity Action League (e.g., "Proportion of Doctorates Earned by Women, by Area and Field, 1960–1969"[59]); the National Organization of Women (NOW; Phyllis Segal, President, letter of 13 November, 1978); Ohio NOW (Eva Janecek, President), and especially Charles Duffy, Area Office Director, Office of Federal Contract

Compliance Programs, U.S. Department of Labor. The data were important in documenting the representation of women and minorities at universities and within departments relative to their availability in the workforce. Many letters, mostly to Kent State President Glenn Olds and the Board of Trustees, urged the University to comply with federal findings. For example, William Vannoy, President of Local #153, American Federation of State, County and Municipal Employees (AFSCME), AFL-CIO, wrote on 3 February 1977:

> Local #153, AFSCME, AFL-CIO believes that the administration of Kent State University plans to oppose the Findings by the Department of Health, Education and Welfare, Office for Civil Rights (ORC), in the case of Dr. Shirley Graham and her discrimination charges against the university. We feel it is in the best interest of the university community to honor these findings by HEW (ORC), and comply with the law with good grace. To do otherwise makes a mockery of the declaration by the university of its commitment to equal opportunity and casts doubts on its credibility.

Charles Duffy's persistent efforts at the U.S. Labor Department kept the case active and prevented it from becoming lost in the piles of complaints on the desks of woefully understaffed regional and federal offices.

Finally, without acknowledging violation of Executive Order 11246, the university signed a conciliation agreement on 22 December 1982. The settlement and later agreements resulted in the university providing back pay, contributing to retirement and benefits for the period, appointing the claimant adjunct associate professor (without compensation) and laboratory coordinator (with compensation), providing suitable office space, and barring any retaliation. Ultimately, five years later, she competed for and won a full-time tenure-track faculty position in the Department of Biological Sciences at Kent State University.

Several odd events happened during this period of litigation. One tragic irony involved the botanist hired in the department during the period of litigation. The position was to "teach plant anatomy, general biology, and some discipline of botany" (no research specialty mentioned). Shirley had taken the course in plant anatomy at Michigan and had published anatomical research on the plant family Lythraceae. This was obviously sufficient qualification for teaching it to mostly nonmajor undergraduates at Kent State University, but the job was given to a very nice, low-key person named John Byrne who was in no way involved in the discrimination actions. Only after John had applied did the chairman begin describing the research area, after the fact, as having been for a plant anatomist, and prior to considering any applications, the chairman mentioned to one faculty

member, overheard by another, that "I will never hire her in the department." Unfortunately, John died five years after arriving at Kent, and with a position now opened at the introductory level for which Shirley more than qualified, the university had little choice—and by this time, probably little resolve to fight her application for the job—and the real possibility this time of losing federal funding.

A second oddity was that the two persons whom the chairman had already indicated he was going to hire somehow knew when to respond in writing for a position advertisement carrying no deadline. Written applications were not the norm for temporary part-time teaching; Shirley had not been asked to fill one out in nine years of previous employment. The applications appeared simultaneously and were said to be dated one day before Shirley's was received. When, however, the originals were examined, one application carried no date and one had been postdated. In regard to a position open on a regional campus, the chairman said in a faculty meeting it had not been advertised because he would have had to hire a woman if one applied.

One event that provided a digression from the seriousness of the proceedings was when I was asked to suggest a botanical motif for one of the wall-sized paintings that were to permanently adorn the biology building. I provided a colored picture of *Cuphea*, and the artist dutifully executed it prominently on the second-floor wall of the building. There is some satisfaction in knowing that Shirley's principal research plant is emblazoned on the wall of Cunningham Hall at Kent State University.

Finally, the oddest incident of all involved an attorney hired early on to file the lawsuit. In those days there were few lawyers experienced in discrimination cases and fewer still who would take such cases unless a win appeared certain. This attorney was out of his league against the legal counsel hired by the university, and by the time the case was taken over by the Labor Department, he was no longer involved. A short time later, the *Akron Beacon Journal* carried a story that he had been convicted of carrying money for a friend to a hit man to commit a murder. The friend had hired the hit man to kill his brother to obtain his father's inheritance, and the attorney was the go-between. In an act of real bravado, the attorney sued one of the plaintiffs in the Kent State gender-discrimination case from prison for nonpayment of legal fees—and won.

This was a suitably bizarre conclusion to an episode that never should have happened, costing both sides a great deal but ultimately ending satisfactorily. It was an experience that added many strands to the academic fabric. It demonstrated how much can be required to change the system, but the ultimate result was to strengthen resolve to continue working in the ivory tower—which has proved to be anything but an "arid world of scholarship."[60]

We've been down the road of life together
Yes, we've gone a mile or two
But I couldn't have made this journey
No, I wouldn't have made this journey
I'm glad I made this journey with you.
("With You," the Happy Goodmans)

Epilogue

Commandments, Opinions, and Wild Guesses

Some colleagues hearing of these events and experiences in the ivory tower suggested they might be of interest to new faculty beginning their own ascent of the academic ladder. The events and experiences will differ, and times have changed, but how we approach service, administration, teaching, and research, as well as how we react to challenges and opportunities, are shaped early and become a durable part of our persona. So are our reactions to social trends outside the tower that affect academic life. Among the lessons I learned during my particular journey are that we are the product of a personalizing and professionalizing history and that we have been fashioned in large measure by that history. Recognizing this gives us the potential to realize that few things

can be canonized as "right" in the absolute sense and practiced *in perpetuity*. This realization imparts the flexibility necessary to adjust attitudes and alter approaches to education. Some things we bring with us from our early years, like family traditions and the ways of former professors and mentors. These can be useful, but they almost always need editing over the multiple decades of a professional career. Thus, if our goal is not just to teach, research, serve, and administer satisfactorily but also, as far as our situations and our limitations will allow, to aspire to excellence, then,

1. *Know Thyself*. The first academic commandment is to "know thyself," as inscribed on the Temple of Apollo at Delphi, and adjust accordingly. Related to this, know the social trends of the times because in large measure they will affect attitudes, goals, and values and will shape those of the students we are trying to educate.

2. *Know Thy Subject*. Know it well and keep it relevant. Among the many things that follow from this is the likelihood that great satisfaction will come from "nailing it" in lectures and from making discoveries in research. Many perks are earned along the way in the form of grants, awards, professional recognition, invitations to participate in national and international meetings, travel, meeting interesting and stimulating people; from publications in respected journals and by prestige presses; and from the discoveries of students, their successes, and their respect, knowing they are quite perceptive in distinguishing between "the genuines" and those trying to drape the mantle of greatness over their own shoulders. In essence, judge and expect to be judged on what is produced and not on what is claimed. This provides a solid and defensible basis for evaluating others and for being evaluated.

3. *Know Thy Administrator*. Know his or her background, strengths, weaknesses, and prejudices. This practical, street-smart information can be useful in forging satisfactory professional relationships with administrators, receiving their support, minimizing confrontations, avoiding interference, and establishing the best environment conducive to teaching and research. It is also helpful to know the administrative structure and the interactions between units within the university. For example, in the days before sabbaticals at Kent State there was a program called "Academic Leaves," which provided one semester free of teaching every three or four years. Applications were made to the College of Arts and Sciences. When sabbaticals were later initiated (a year free of teaching every seven years), the Academic Leaves program was left in place, and sabbaticals were granted to eligible faculty through application to the provost's office. The two programs were not coordinated, so by adopting a "Mr. Roberts" approach, and remembering the adage about left hands and right hands, for many years I

received one semester free for research every three years, a year free every seven years, and summers free through NSF or university support; and thus established a satisfactory research program while sustaining an enthusiasm for teaching over nearly four decades.

4. *Carry as Little Psychobaggage as Possible*. Psychobaggage complicates and weighs down everything else. There should be as few personal agendas, vendettas, and ego-emissions as possible because, in addition to ethical considerations, there are often practical consequences to behavior that goes too far beyond the norm. Such behavior inevitably becomes part of one's identity, it usually affects one's standing among colleagues, and may not always be apparent to the individual—especially when the individual is insolated within "schools" or reinforced within groups of like minds. Theatrics and eccentricities that go too far can also delay achieving the goal of teaching and research—acquiring and sharing knowledge through lectures, presentations, inventions, and publications. A good tapestry is difficult enough to weave without incorporating, unconsciously or indifferently, too many strands weakened by the compensating, self-serving baggage of blackbirds.

5. *Hit the Ground Running with Regard to Course Preparation, Publications, and Grants*. Do this even if the first place of employment is a school of modest reputation because it may be home longer than expected. Compartmentalizing the many diverse responsibilities within the profession is useful, as is factoring in intervals for solitary contemplation. It is further worthwhile to prioritize the many peripheral interests stimulated at a good university because it must be recognized that the time devoted to these outside interests is coming from somewhere.

6. *Limit Administrative Involvement and Committee Participation Early on to Involvement Where Meaningful Contributions Can Be Made.*

7. *Monitor Students with Exceptional Abilities for Their Focus and Long-term Commitment*. Easy success at the beginning may not prepare them for what's to come. Above-average students with organizational skills, discipline, and a strong work ethic also have the potential for exceptional achievement and long-term productivity. The conditions under which both groups make their way through college should be tracked because brightness can often be obscured by limiting personal circumstances. Excessive use of electronic teaching limits this personalized tracking.

8. *Strengthen Existing Educational Programs and Initiate New Ones*. Such work is satisfying to the innovator, valuable to the recipients, and an enduring contribution to the institution.

9. *Consider the Possibility of Uniting through Unions*. This may ultimately be the only way to prevent the country from declining further from first to 12th

place in global education. Another worthwhile task is to identify where residues of practices and attitudes described in this book still linger in the operations of the mid-echelon schools. Preserving the "pursuit, production, dissemination, application, and preservation of knowledge" is of fundamental importance if these are, indeed, "the central activities of a civilization" (Menand, 2010: 13).

10. *Challenge Injustices and Extremism through Reason When Possible and with Strength When Necessary.* It benefits the individual and improves the institution. External forces keep the conditions for teaching, research, service, and administration in a state of flux. An awareness of these forces and the realities of life in the ivory towers great and small, together with a bit of self-analysis about the personalizing and professionalizing events that condition us as professionals, instills flexibility and allows for the necessary adjustments. The challenge will be to find ways of successfully navigating new and ever-changing landscapes, rather than continuing to climb the same familiar ladder.

"Aye, There's the Rub"

Some colleagues reading the manuscript said they expected an eventual toning down of concerns and to find a comforting rejection to the conclusion that the United States has crossed a threshold and has had its day of unilateral dominance in the sun. In my opinion, that is what the data show, and my guess is that it is not realistic to pretend that things are going to turn around internally or that our repositioning within the community of nations is going to reverse. The pathway for such a remote possibility is addressed by Thomas Friedman and Michael Mandelbaum (2011) in *How America Fell Behind in the World It Invented and How We Can Come Back.* The formidable role of the university is to help slow the decline and soften the landing by convincing the small audience directly under its influence that ethics matter, that cooperation in national politics and adjustments to international realities is essential, that science and religion do not mix in a science curriculum, and that environmental deterioration is real and harmful. It will then be necessary for those converted to convince the general public. The Herculean nature of the task is shown by current trends in a single component: The Global Carbon Project reports that after all the fanfare of the past decade, CO_2 emissions in 2010 actually increased by 5.9%, or by half a billion tons, and that it was the largest increase on record[61] (Gillis, 2011b). Achieving the goal of societal improvement and sustainability will further require at least a generation of time and an education system adequately supported, capable, and sufficiently organized for the task. Aye, that's the rub, indeed, and each individual can assess for herself or himself the prospects for success. In the relatively near future, we should have an answer.

APPENDIX

Participants of the Biological Field Studies Summer Sessions in Mexico and the American West, Kent State University, 1974–1985

1974: Mexico

Staff

Alan Graham
Benjamin Foote
David Waller

Guest Faculty

Orrin Shane
Vincent Gallicchio
Judy Hopkinson
David Hopkinson

Students

Robert Antibus
Thomas Arsuffi
Bonnie Behrens
Robert Black (Ph.D. in ecology, University of Washington, later faculty member at Washington State University)
John Busacca
Diane Desteven (Ph.D., University of Michigan)
Donald Dunkle
Karen Dyer
John Francis
Alan Frank
David Franko (Ph.D., Kent State University, later chairman, Miami University, Ohio)
David Halupka
Floyd Herold
Lynne Herold (Ph.D., Scripps)
Kathryn Knapp
Phillip Lecso (M.D., later College of Medicine, Toledo)
Constance Marczak
Manfred Michalski
Gwendolyn Miller
Angelo Mitchell
Gerald Myers

Dolores Pinchot
Dale Powell
Stephen Radvansky
Betsy Russell
Martin Schmidt (Ph.D., Kent State University, environmental geology)
Linda Shane (Ph.D., Kent State University, later research associate, Limnological Research Center, University of Minnesota)
Theodosia Sideropoulos
Carl Sims (master's degree, Kent State University)
James Smolka
Lewis Tandy
Martin Tkac
Kevina Vulinec
David Williamson and wife
Wayne Zipperer (Ph.D., Syracuse University)

Other Participants
Accompanying student from Mexico: Alfonso Delgado (later Ph.D., University of Texas)
Lecturers in Mexico: Dr. Jorge Rzedowski, Dr. Marcus Winter

1975: Mexico

Staff
Alan Graham
Benjamin Foote
David Waller

Guest Faculty
Frank Erickson
Robert Stokes

Students
Moira Baird
Gary Barker (Ph.D., Kent State University, later with BP Amoco)
Leonard Behr
Bruce Brace
Beverly Bridle
Margaret Dalrymple
Jeanne DiFranco
Sara Dilgren
David Emmitt
Lynnette Foote (daughter of Benjamin and Anita Foote)
Sheri Foote (daughter of Benjamin and Anita Foote)
Linn Haramis
Karin Hennigan
Robert Hoskin
Karen Hummell (Ph.D., University of Arizona)

Alexander Huryn (Ph.D., University of Georgia)
Jeff Johnson
David Kerruish
Robert Kunst
Donna Lisiecki (taught in Saudi Arabia, ARAMCO; later in Alaska)
Barbara Long
Susan Malycke
Sara Meeks
Ronald Miska (Ph.D., University of Michigan)
Aaron Moats
Paul Moseley
James Mulder
Samson Olatungi
J. D. Oreschak
Lucy Perko (master's degree, Kent State University)
Jeffrey Quin
Vicki Raymont
Cindy Rebar
James Semple
Susan Sernoffsky
Robert Shemory
Michael Sherman
Mary Beth Tolar
Janice Vasco
Charles Veleba
Joanne Vinopal

Other Participants
Accompanying student from Mexico: Alfonso Delgado (later Ph.D., University of Texas)
Lecturers in Mexico: Dr. Alan Philips (ornithology), Dr. Jorge Rzedowski (vegetation of Mexico)

1976: Mexico

Staff
Alan Graham
Benjamin Foote
David Waller

Guest Faculty
Frank Reed

Students
Barbara Andreas (Ph.D. and later faculty member, Kent State University)
Beverly Bevington
John Bevington
Susan Bowman
Harold Brunstetter

Joan Buemi
Christopher Corl
Scott Crislip
Debera Cutrell
Eric Davis
Josephine Derocher
Peter Dewolfe
Lynn Drummer
John Dunning (Ph.D., Purdue)
Jeffrey Eschedor
Patsy Ford
Laura Frick
Jon Gardner
Susan Hudak
David Huff
William James
Debra Jesionowski
Pauline Kan
Bill Ladanyi
Mary Lewis
Jean Lodge (Ph.D., Virginia Polytechnic Institute, later Institute for Tropical Forestry, USDA–Forest Service, Luquillo, Puerto Rico)
Jan Metcalf
William Moncheck
Randall Nagel
Marylee Pittak
Jeffery Quin
Paul Pusey
Wayne Sevier
Mary Siders
Donna Silverman
Robin Smerling
Phyllis Smith
Robert Stewart
Teresa Tansey
John Walters
Mark Wingert
David Young

Other Participants
Accompanying person from Mexico: Dr. Andrew Vovides
Lecturers in Mexico: Dr. Marcus Winter (archaeology), Dr. Fernando Medellin L. (arid land ecology)

1977: Mexico
Staff

Alan Graham

Guest Faculty
Frank Reed

Associate Staff
Tom Arsuffi
Wayne Zipperer
James Smolka

Students
Eujeanne Angus
Rodney Beals (environmental manager, Ohio Environmental Protection Agency)
Richard Bennett
Raymond Black
Ernest Bernice
Janice Bernice
Dale Burton
James Fete (sales representative for Beckman-Coulter)
David Freede
Alan Gebben
Karen Gribble
Catherine Hallisy
Vicki Hammeren
Martin Hilovsky
Wendy Humphrey
Craig Kreiger
Lucy Perko Kreiger (master's degree, Kent State University)
Robert Lambert
Craig Lanik
William Markin
Thomas McGuirk
Dan Nelson
Thomas Ocepek
Mary Kay Pohmurski
Jeb Putnam
Janice Schindler
James Shafer
William Shelton
Janice Sroubek
Eva Thil
John Toth
Marilyn Vavrek
Audrey Wanstreet

Other Participants
Accompanying persons from Mexico: Dr. Andrew Vovides, Victoria Vovides

Lectureres in Mexico: Dr. Fernando Medellin L. (arid land ecology), Dr. Marcus Winter (archaeology)

1979: Mexico

Staff

Alan Graham
Benjamin Foote
David Waller

Students

Mobarak Al-Osiemi
Pamela Barnes
John Backer
Marjorie Cabaniss
Morris Chaney
Kenneth Christensen
Thomas Dent
John Dunning
Joyce Elavsky
Steven English
Jeff Eschedor
Sheri Foote
Sherilyn Fritz (Ph.D., University of Minnesota, George Holmes University Professor of Earth and Atmospheric Sciences, University of Nebraska, Lincoln)
Calvin Frye
Lucinda Garmus
Sherilyn Garrett
Howard Grandon
David Greffenius
Barbara Heflin
William Humphrey
Laurie Irwin
Prudence Jackson
Laura Klein
John Lehman
Pamela Long
Roberta McMillan
Constance McPherson (master's degree, Kent State University, later Amoco Production Company, Tulsa)
Eric Naji
Larry Peyton
Russell Rozak
Ronald Shadrach
Phyllis Smith
Janet Taylor
Susan Whittier
Gary Wireman

Suellen Wireman

Other Participants
Accompanying student from Mexico: Rosa Pedraza
Lecturers in Mexico: Dr. Fernando Medellin L. (arid land ecology), Dr. Marcus Winter (archaeology)

1981: Mexico

Staff
Alan Graham
Benjamin Foote
David Waller

Students
Stephen Beck
Kevin Boyd
Shane Brugler
Katherine Christensen (doctor of veterinary medicine)
Siu Chung
William Folley
Sheri Foote
Linda Heath
Roy Henry
Garry Homany
George Host (Ph.D., University of Michigan)
Debra Illes
Darrell James
Irvin Lutz
Jens Mullen (Ph.D., University of Wisconsin)
Janet Nelson
Sandra Olmsted
David Straffon
Valerie Stuermer
Leo Summers
Roy Thetford
Julie Todd
Trevor Vidic
Margaret Wilson
Debora Zombeck

Other Participants
Accompanying student from Mexico: Jose Luis Alvarado
Lecturers in Mexico: Dr. Fernando Medellin L. (arid land ecology), Dr. Marcus Winter (archaeology)

1982: American West and Puerto Pinasco, Mexico

Staff

Alan Graham
Benjamin Foote
David Waller

Students
Maurine Austin
Jon Elias
Lynette Foote
Virgil Fritz
David Hawthorne
Matthew Heider (M.D., University of Toledo)
David Killius
Renee Licavoli
Laurie Lobaugh
Pamela Long
Karen Mendiola
Rosemary Novy
Georgette Sass
Martha Swiss
Lillian Terrion
Julie Todd
Deborah Zombeck

Other Participants
Accompanying participants: John Dunning (University of Arizona; 1976, 1979 trip participant), Karen Hummell Yohen (1975 trip participant)
Lecturer: Dr. Alan Stokes, Bear River Migratory Bird Refuge

1983: Mexico

Staff
Alan Graham
Benjamin Foote
David Waller

Students
Barbara Bailey
Lynette Foote
Sheri Foote
Mark Ford (dentistry, Ohio State University)
Richard Goldsworth
Alison Graham
Matthew Heider (M.D., University of Toledo)
Fadhil Hussein
Jon Killian
David Lewis
Erik Neff

George Robinson
Michelle Rook
Lisanne Sims (M.D., University of Nevada)
Larry Snyder
Jonathan Straffon

Other Participants
Accompanying students from Mexico: Jose Luis Alvarado, Monica Ayala-Nieta
Lecturer in Mexico: Dr. Fernando Medellin L. (arid land ecology)

1984: American West (Northwest and Canada)
Staff
Alan Graham
Benjamin Foote
David Waller

Students
Jane Anderson (master's degree, Kent State University)
Tom Baughman
Karen Beppler
Claudette Bibro (M.D., Ohio State University)
Dan Brown
Susan Cortright
Gordon Crock
Joseph Deranek
Lisa Deranek (M.D., Ohio State University)
Mark Ford (dentistry, Ohio State University)
Linda Frisbie
Grant Foote
Diane Gelbaugh
Richard Goldsworth (medical laboratory technician, Case Western Reserve University)
Bruce Graham
Wendy Hall
Brenda Hilty
Dennis Howell
Katrina Jordan
David Killius
Stephen Lajeunesse
Nancy Maffitt
Florencio Marquinez
Eugene Rundo (Ph.D., Colorado State University)
Marilyn Sankey
Julie Todd

1985: American West and Mexico (to Mexico City)

Staff

Alan Graham
Benjamin Foote

Students

Ariel Andrews
Mark Davis
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