T. Leonard Kelly: Master Teacher

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It was September of 1952. I was one of nearly 200 freshmen seated in the back, underclassman section, of the Horace Mann Auditorium at Bridgewater State Teachers College. Above us at the left was a series of murals painted in an arched pattern which echoed the shapes of large, beautiful windows on the opposite wall. The central and most brightly colored mural, which depicted Horace Mann administering the first Normal School entrance examination (1840) to three young women under the legend, “A Trained Teacher For Every Child,” most assuredly inspired more than one aspiring teacher.

The murmur of excited voices stopped abruptly, leaving my own voice ringing in my ears, when a slight, angular Dickensian scholar, the President of the College, entered. He spoke gently. After a brief welcome, he introduced the chairperson of each program so that the special joys and requirements of studying one’s chosen discipline might be described.

After what seemed an eternity, the head of the Math-Science program, T. Leonard Kelly, was introduced. A tall handsome man, elegantly attired in a gray pin-striped suit, strode to the front of the group. His full head of silver hair glistened with moisture; a thin mustache added distinction to his face and framed a mouth which appeared to have been shaped by many a smile. Bright blue eyes gazed intensely through thick lenses.

Most striking was his resonant, forceful voice — the French horn of an orchestra. A slight slurring of the s’s added interest to the clear and precise quality of his speech. He spoke bluntly, without any attempt to cajole; “If you don’t intend to study, get out now.” Although we expected to be engaged in the search for Truth, it was startling to hear the truth spoken so unequivocally.

The next day we met for the first chemistry lecture. About 30 of us entered a classic lecture hall with raised seating. The springy hardwood floor which squeaked as one walked and the splintered side-arm oak chairs which swayed as one sat down and with each subsequent movement reflected the uncertainty we all felt.

Punctually, Professor Kelly, quite imposing in his spotless white lab coat, entered via a door at the right which led from the laboratory. He pushed a cart to the front of the large demonstration table and transferred a number of containers of chemicals from the cart to the table. “Chemistry,” he said, “is what chemists do”; a sensible definition and one which put us at ease and exemplified his approach: to make sense of what has been described as a science in which one tries to determine what is in a sealed box without opening it.

The discussion had turned to the importance of observation and the care with which deductions should be made. I was the second student to be called to the front. Professor Kelly handed me a bottle and since the first student had reacted, thinking that such a man not need or want such reassurances. She answered that he had very few personal reasons. I asked her how he was the highest respect for him and his skill as a teacher and was leaving for personal reasons. I asked her how he had reacted, thinking that such a man not need or want such reassurances. She answered that he had very graciously thanked her and wished her well. This was the first indication that what he was to tell us shortly before graduation was true: that TL (the name by which we all had come to call him, except to his face) was an abbreviation for “tender loving” and not, as we had heard, for “tough luck.”

TL was born just before the turn of the century, on August 17, 1898. It was a time when experiments pivotal to the understanding of chemistry were being performed. Sir J.J. Thomson had, in the previous year, discovered the electron and Ernest Rutherford was beginning his exploration of radioactivity which led to the modern picture of the atom. These and subsequent discoveries gave a new, more theoretical face to
chemistry, which made it possible for TL to pose his favorite question. "Why?"

The enthusiasm and sense of adventure in being a chemist developed during his youth and imparted to us are described in the reflections of Thomson, whom he was fond of quoting: "As we conquer peak after peak we see in front of us regions full of interest and beauty, but we do not see our goal, we do not see the horizon; in the distance tower still higher peaks, which will yield to those who ascend still wider prospects."

TL brought to his teaching a training in the classics acquired from the Jesuits at the College of the Holy Cross, where he enrolled in September of 1917. Tuition was $100 and board and lodging $300 per year (the average yearly non-farm salary in 1917 was $866) and to defray expenses he served as the college mailman for four years.

Entrance examinations were given in Latin, Greek, English, history, math and a modern foreign language and the college curriculum required continuation of study in all of these areas as well as in religion, philosophy, economics and the sciences. He graduated cum laude in 1921 and his classmates recognized in him two attributes essential to the successful teacher: "no member will ever forget TL's keen knowledge in this branch of study (Chemistry) and his helping hand in many an unfortunate's hour of despair."

This training in the classics, with its emphasis on language, was evident in the skill with which he taught the language of science, which has its roots in Latin and Greek. His explanation for the naming of a series of sulfur-containing compounds with skunk-like odors is illustrative. Interestingly, these compounds are not named for their foul odors but for their ability to tightly bind mercury and other toxic metals, a property which accounts for their use as antidotes for metal poisoning. Their name, mercaptan, comes from the Latin mercurium capitan, which means seizing mercury. An anecdote solidified this word in the memory. Kelly told of a colleague who studied mercaptans, the odors of which linger, and of this man's uncanny ability to find an empty seat even on the most crowded trolley.

Being one of the top students to graduate from Holy Cross in 1921, he was offered an assistantship and acceptance into the Master's program in Chemistry. Upon receipt of the Master's Degree in 1924, he was named Assistant Professor of Chemistry, an unusual honor.

During the 1926-7 academic year Kelly took a leave of absence from teaching to enter the Ph.D. program at Columbia University. He was awarded a second Master's Degree in 1927. The Ph.D. dissertation he planned to complete on returning to Holy Cross was never finished, due to the pressures of additional teaching responsibilities and those of raising a large family — he and his wife, Mary, were to become the parents of nine.

Columbia Graduate School provided TL with the opportunity to study with scientists whose research and thinking were on the frontier. It also provided him, and through him his students, with a direct academic link to the pioneers of chemical thought: Wöhler, the father of Organic Chemistry and through Wöhler to his professor, Berzelius, who determined accurate atomic weights upon which Dalton based the atomic theory. This link is traced through faculty members at Columbia who had studied with Charles F. Chandler, the founder of Columbia's Chemistry Department, who had sailed on a whaling ship from New Bedford in 1854 to study with Wöhler.

The historic perspective gained at Columbia was evident, for Chemistry as taught by TL was peopled with a cast of interesting characters. His description of the great organic chemist Louis Feiser of Harvard, who pioneered the investigation of the carcinogenicity of aromatic compounds, was so vivid that when we accompanied TL to Student Night at MIT the highlight of the experience was not the speaker, his topic, or the locale, but the presence of Feiser in the audience.

TL was to remain at Holy Cross until 1936, during which time he was an integral member of the only graduate program at the College to be accredited by the AAU. He directed research in analytic, colloidal and, his speciality, organic chemistry, and published a number of articles in the highly respected Journal of the American Chemical Society.

When Chandler had begun teaching at Columbia in 1864, no salary had been provided. The professor was expected to collect his salary in student fees. A salary was provided at Holy Cross in 1936, but that of a junior faculty member was insufficient to support a growing family. Thus, for financial reasons, TL left Holy Cross to become a senior faculty member and the lone science (Biology, Chemistry and Physics) teacher at Westfield State Teachers College.

When a position opened at Bridgewater, a college which had a long tradition of training teachers of science and which afforded him the opportunity to again become Professor of Chemistry, he asked for and was granted a transfer effective February 24, 1942. Due to the circumstances of the transfer he lived temporarily in Tillinghast Hall while making arrangements to relocate his family. At Bridgewater, his immediate predecessor had left abruptly after mid-year examinations to run his own business, while lamenting that he had not found a way

Timothy L. Kelly
ESSAY (continued)

to get students to study. TL had the answer: expect it, demand it.

The active research begun at Holy Cross was not to continue. Like Wöhler, TL was to spend the last 30 years of his career devoting virtually all of his energies to teaching and to the development of a strong academic program. He served as the Chairman of the Physical Sciences Department and later of both the Chemistry and Physics Departments which were formed under his leadership in 1964.

In the state colleges, facilities for research did not exist. There was no Chemistry major — the first BS in Chemistry was awarded in 1966; there were no graduate students to direct — the first candidate for an MS enrolled in 1971; the teaching loads were high — as high as 18 with an average of 12 hours per semester; and the most sophisticated pieces of apparatus available were a number of analytic balances and a hydrogen sulfide generator — a generator which emitted the odor of rotten eggs, an odor not detected by the desensitized noses of the fledgling chemists but which added a certain discomfort to the other occupants of Boyden Hall, which housed the laboratory as well as virtually all classrooms and administrative offices. Furthermore, the total value of equipment and materials in 1953 was estimated at only $6500, an amount approximately equal to the annual salary of the Professor. This paucity of materials and a concern for waste and needless pollution of the environment led TL to develop semi-micro techniques which anticipated by many years the current trend toward micro-procedures with one significant difference: these new techniques required expensive, specially designed glassware, but he preferred the cheap but elegant test tube.

The most significant drawback to active research was the inadequate library, which was housed in a large room divided by arches which now houses the President's office. In 1953, the library held just over 25,000 books, with only 3,000 in all branches of science. TL encouraged us to visit a real library. Many of the classrooms were decorated with works of art and on the lecture hall walls hung reproductions of two allegorical murals by Puvis de Chavannes. He called our attention to the one entitled "Physics," which had been described by Puvis as depicting "the wondrous agency of Electricity, Speech flashes through Space and swift as lightning bears tidings of good and evil." TL urged us to visit the Boston Public Library where the originals decorate a magnificent staircase and as additional incentive he offered extra credit to anyone who found out why mercury, that intriguing metallic liquid, was shipped in 76 lb flasks — a most odd unit of weight. (As it turns out, 76 lb is equivalent to 75 librae, a Roman unit of weight. The Romans, who mined and processed mercury ore in Spain, chose a weight which was convenient for a man to carry and this unit had somehow survived over the centuries.)

TL's philosophy of teaching mirrored that expressed by his professor at Holy Cross, Rev. George L. Coyle, S.J.; that is, "a student should derive more than technical expertise from his study of Chemistry." TL stressed that the study of chemistry and physics required the development of skill in logical reasoning; a failure to develop this skill was seen by him as the "greatest deficiency in the American system of public education." In addition, he tried to instill the homely virtues such as humility; not an externally expressed humility which we would have seen as false in him as a role model, but an internalized one: "the more we learn, the more we know how little we know." And as a corollary, he warned that since chance may be as important as plan in scientific discovery, we must be prepared to take advantage of accidental occurrences, a skill he called serendipity, a word coined in 1754 which has recently gained in popular usage but was new to us. He exemplified serendipity with a story of a chemist who discovered a metal catalyzed reaction when a thermometer he was using as a stirring rod — something we had been warned never to do — broke, spilling mercury into his reaction mixture. He also instilled independence, especially in the laboratory. After giving initial directions, he would retire to his office-stockroom, adjacent to the laboratory, to return from time to time to check our progress. His assistant, Elmer, who was not a trained chemist, was left to supervise but not to coach. At least initially we did not realize that he had set up a series of mirrors so that he could see into the laboratory in case of a real disaster.

In the post World War II years, which he described as an "era of changing and of oftentimes doubtful philosophies," TL raised a number of important societal issues. For example, he asked: "Does a scientist have a moral obligation to influence the ways in which and the purposes for which his creation is used?" This question was posed, not during a discussion of nuclear reactions, but during a discussion of the preparation of soap. (Napalm, a gel formed when an aluminum soap is suspended in gasoline, was developed during WWII by a team led by Louis Feiser.) Today, most would agree that a scientist does indeed bear such a responsibility, but at the time most of us considered research to be a pure quest for knowledge. (It is interesting to note that when the use of Napalm became the subject of demonstrations in the sixties, demonstrators focused on the government, the manufacturers, and the universities which had contracts with these manufacturers, but did not focus on the scientists who had developed it.)

Beginning in the late forties, as a result of his reputation as a distinguished and demanding teacher, TL was able to arrange for Bridgewater students to enroll in the Master's program at Boston College and to receive assistantships, an economic necessity for most. The success of every student he sent to BC is testimony to his teaching. We had taken but half the courses in chemistry required in the bona fide programs taken by those with whom we were to compete. But we had studied all of our chemistry with TL and had practiced the art of analytical thinking required in his well-constructed examinations, which always incorporated that one question which required creativity and the extension of a logical argument beyond the point reached in class or in the text,
and that made the difference.

Lest one think that this was an all too serious man, it should be noted that he had a zest for life and was noted for his jovial manner. Reports circulated that he could be seen during the summer months in a Cape Cod pub dressed in Bermuda shorts, wearing sandals, sporting a full beard and engaged in lively conversation — an image hard to reconcile with his professional persona. In addition, he was known to have an acerbic wit, describing one colleague known for procrastination as the “late Mr. P” and a verbose administrator as “a sender, not a receiver.”

TL retired in 1965 at the age of 67, the year his youngest child graduated from college, to travel the world, an odyssey he had planned from youth. His last lecture in Physical Science, a required course for students in the Elementary Education program, was given in the lecture hall of the new science building, built in 1964, before a class of about 200. The standing ovation he received — such a demonstration of appreciation is not a tradition at Bridgewater — was a symbol of the affection and respect felt, but rarely expressed, by former students of almost half a century.

It has often been said that teaching is an ephemeral art form, that each performance is written on the wind. I believe the contrary to be true; that the law of conservation of energy applied to teaching and that the energy of this master teacher, T. Leonard Kelly, who took such great joy in the accomplishments of his students is immortalized in the lives and careers of these students to be passed on undiminished.