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Acceptance of the Clark P. Read Mentor Award: Students, Opportunity, Serendipity, and W.B. Yeats: *"Education Is Not the Filling of a Pail; It Is the Lighting of a Fire"*

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**ACCEPTANCE OF THE CLARK P. READ MENTOR AWARD:
STUDENTS, OPPORTUNITY, SERENDIPITY, AND W.B. YEATS:
“EDUCATION IS NOT THE FILLING OF A PAIL; IT IS THE LIGHTING OF A FIRE”**



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Thank you for being here this afternoon; I am truly humbled but, alas, not speechless. Thank you, Janice and Steve, for beginning this process and seeing it to conclusion. Thank you to my other graduate students and to old friends and colleagues who wrote letters of support, and lied convincingly. Thank you to Kelli Sapp and the members of the Awards Committee for opening and reading the file, even after seeing my name on it. And thank you to this wonderful society, the American Society of Parasitologists (ASP), for providing me with an environment and a home in which my students and I could always feel welcome and thrive.

Three words are the centerpiece of my talk: students, opportunity, and serendipity. Students, obviously, are central to all mentors. Opportunity, because several of my students said at different times that I had given them a chance by admitting them into graduate school and my laboratory, an opportunity

no one else offered them. Serendipity, to make discoveries of things which one is not in quest of and/or the effect by which one accidentally discovers something fortunate, especially while looking for something else entirely; in other words, even a blind hog gets an acorn every now and then.

When I read the acceptance talks of the 8 colleagues I'll join as ASP Mentors, I had a sense that they knew what they were doing, what they wanted to be when they grew up, and how to get there. Today, I become the exception to this group. I was going to be a high school biology and math teacher and coach football and swimming.

As I thought about my own journey prior to this talk, I became convinced there is no such thing as a “self-made” person. All of us are influenced by people around us during every moment of our lives. We all can identify people who have, in some way, large or small, altered the trajectory of our life. Thus,

looking back, I'm convinced I had little to do with how I arrived on this stage today; I'm just a chimera, an amalgam of all those interactions, having adopted, hopefully, some of the good traits of those who influenced my trajectory. Before philosophizing about mentoring, please let me tell my story about these people who were so important to me. Perhaps some students in the audience, who may have self-doubts similar to mine regarding the path they want to pursue, can take comfort in my early uncertainty and the learning process that spanned most of my life as an academic for 37 years.

Foremost, I dedicate the receipt of this award, and this talk, to 3 of my former students: David W. Reduker (Ph.D., 1984; May 4, 1955–October 25, 1990) was an associate professor of Pathology, College of Veterinary Medicine, Colorado State University, Fort Collins; Michael J. Patrick (Ph.D., 1994; March 9, 1962–March 10, 2000) was an assistant professor of Biology, Penn State University, Altoona; and Lynn A. Hertel (M.S., 1986; August 14, 1951–April 2, 2005), who maintained a nearly 20-yr association with our department working in the laboratory of a colleague, E. S. Loker, and earned her Ph.D. with Sam in 2004. They all were excellent parasitologists! My students who knew them, my family, and I miss them all, dearly and daily.

Today, I want to remember Clark P. Read and remind everyone why this award is aptly named in his honor; pay tribute to the 8 previous recipients; trace my history to becoming and being a mentor; mention the successes of my students; and discuss my mentoring philosophy and the occasional need for fires.

CLARK PHARES READ

Clark was born 4 February 1921, in Fort Worth, and died unexpectedly at his home in Houston, 24 December 1973. I had the privilege and honor to meet and know Dr. Read by his regular attendance at annual meetings of both the Southwestern Association of Parasitologists (SWAP) and the ASP. He sometimes said, perhaps in jest, that he had a distant relationship with Wyatt Earp; if you didn't know Dr. Read, he had that rugged, chiseled look that made you want to believe him. The story of his life and the list of his many accomplishments is summarized elsewhere (Simmons, 1974; Stewart et al., 1975). Suffice it for me to remind us that he was ASP's first recipient of the Henry Baldwin Ward Medal in 1959 (Beaver, 1960). During the relatively short interval of 21 yr, from his promotion to Assistant Professor of Zoology (University of California, Los Angeles [UCLA], 1952) until his untimely death while Professor of Biology (Rice Institute, Houston, 1973), he mentored ~50 graduate students and >38 postdoctoral associates in his various laboratories (Zoology, UCLA; Pathobiology, Johns Hopkins; Biology, Rice; Christ's College, Cambridge; Zoology, Marine Biology Lab, Woods Hole; University of Hawaii). Clark P. Read was truly The Great Mentor, and John Simmons (1974) said it best when he wrote that Clark was, "The most famous and influential American parasitologist of his age and period."

ASP MENTORS: THE LEAGUE OF EXTRAORDINARY GENTLEMEN

I am deeply appreciative to the Awards Committee and to the members of this wonderful Society for the great honor accorded me by adding my name to the distinguished group of extraordinary gentlemen and colleagues already honored: Roy

Anderson (1997), Austin J. MacInnis (1998), Gerald W. Esch (1999), Brent Nickol (2001), John Janovy, Jr. (2003), Sherwin Desser (2004), Gerhard Schad (2005), and Ray Kuhn (2007). What a group of scholars and teachers! When I think about the appropriateness of this award for me and look at my own accomplishments, in all honesty, I find them rather insignificant compared to those of my predecessors.

MY ROAD TO BECOMING A MENTOR AND SERENDIPITY

Parents

Every journey begins with one's parents. My father, Walter, was taken from the 5th grade by his father and put to work in a factory in Chicago. After the Japanese attacked Pearl Harbor, 7 December 1941, he enlisted in the Army and was sent to the European Theater where he fought in the Battle of the Bulge (The Ardennes Offensive) as a member of the U.S. Third Army under the direction of General George S. Patton, Jr. He returned home in 1946 when I met him for the first time at about 3 yr of age. With no formal education, he worked two 8-hr jobs for most of the time I was growing up; he worked as a lathe operator for International Harvester, would come home to eat and sleep for a couple hours, and then go to work for the Chicago and Northwestern Railroad for another 8 hr. My mother, Martha, almost finished high school, but ended up working as a sewing machine operator doing piece-work in a factory in Chicago. Her day started about 0400 and she returned home about 1830 each evening. Thus, I was basically a latchkey kid who learned to be an adult at an early age. The inspiration from my parents was: "Work hard, go to college, and something good will come of your life."

Undergraduate influence (1961–66)

I went to Wisconsin State University, River Falls, to play football and learn to become a high school teacher. With majors in math, biology, and secondary education, I was on my way to accomplishing that simple goal. But during Fall Quarter, 1965, my senior year, I took Biol. 225—Parasitology from Dr. Robert L. Calentine (1929–2007). Near the end of the quarter, Dr. Calentine asked me, "Where are you going to graduate school?" I replied that I wasn't smart enough to go to graduate school. To cut to the chase, Bob Calentine made me apply and go to graduate school. My applications secured 2 offers, 1 from Iowa State University, Ames, with Dr. Martin J. Ulmer (Calentine's former major advisor) and 1 from Colorado State University (CSU), Fort Collins, with Dr. O. Wilford Olson. For a young Polish boy from Chicago who had never been west of the Mississippi, the choice was obvious.

Graduate influences (1966–70)

Dr. Olson gave me the opportunity (note that word again) to attend graduate school. He also introduced me to 2 individuals who would have a significant impact on my future thoughts and scientific training/direction. John E. Ubelaker was Dr. Olson's last Ph.D. student, and I was told that I would share a lab/office with him. My first day in the Department of Zoology, I moved into my office, talked briefly with John, then left to buy books and go to my apartment. The next day when I got to Zoology, John treated me as if I had committed a heinous crime. "Where

the hell were you last night? Why weren't you in the lab?" I answered that I was at home. John taught me the difference between a college and a university: at a university, the lights are on at night. He taught me, in no uncertain terms, that as a graduate student—especially a student of Dr. Olson's—that I was expected to be in the lab working, not only every evening, but also on weekends. Unless I was traveling, I never missed another evening or weekend in the lab. Never. And I later expected the same of my own students.

CSU was on the quarter system then, too. I spent the first quarter and a half, through Christmas break, working on a nematode systematics problem for Dr. Olson. I was lost. The genus (*Oswaldocruzia* spp.) was in taxonomic disarray and, to my untrained eye, all nematodes looked alike (helminthologists say that about coccidian oocysts!). Dr. William C. Marquardt was hired in Zoology the year before I arrived (1965–66) to mentor the parasitology program after Dr. Olson officially retired (summer 1967). Prior to CSU, he had been a professor at the University of Illinois. Bill walked into my lab one day during that holiday break (January 1967) and asked how I was doing. I explained my frustration with nematodes and reasoned with him that since Dr. Olson would retire in June of that fiscal year, it might be best for me to switch to his program. He said he'd consider taking me as his first graduate student at CSU, but wanted to look at my transcripts and letters. Days later, when he called me into his office, I experienced the first of several "humbling" episodes with him. "How the hell did you get an undergraduate degree in biology without taking any chemistry?" was the first question he asked. I ended up taking 2 yr of undergraduate and graduate chemistry, along with many other classes during my 4 yr at CSU; heavy course loads was another cross many of my students would have to bear. Bill taught me about the coccidia and also suggested I apply for the second-ever class in the Organization of Tropical Biology (OTS) program in Costa Rica, an opportunity that materialized for me (summer, 1967) and changed the future direction of my teaching and research.

Lillian F. Mayberry began her Ph.D. in Zoology with Bill (fall, 1969) my last year at CSU. Thus, Lil and I overlapped by 1 yr, just as John Ubelaker and I had overlapped during my first year there. And, like John and me, Lil and I became lifelong friends. Lil had just finished her M.S. at the University of Nevada, Reno, and I helped her change her thesis into her first manuscript. In a way, Lil was my first graduate student. We also became colleagues for life and, years later, when she was the newly appointed Secretary-Treasurer of ASP, she appointed me (1987) to be our Scientific Program Officer; this job allowed me to meet and get to know almost everyone in ASP who participated in our annual meetings for the next 22 yr. It also provided me the opportunity to help many ASP graduate and undergraduate students by initiating both the Student Auction and the Student Symposium, which now have become part of the fabric of our annual meetings.

During my last year at CSU, I won 2 job interviews, Western Kentucky University, Bowling Green, and the University of New Mexico (UNM), Albuquerque. I didn't get the job at Western Kentucky, but I was asked to join the Biology faculty at UNM as an assistant professor, an opportunity to build a parasitology program at a major university which never had hired a parasitologist before.

Formative years at UNM (1970–78)

UNM Biology was mostly a teaching department when I arrived in 1970. I tried to learn (not always successfully) from my many mistakes in teaching and tried to learn how not to make (egregious) mistakes in science by watching what others were doing right. I did this by attending 3–4 parasitology meetings each year, at which I listened. I met and spoke with many of the leaders in all aspects of parasitology, including Clark Read, not just to those who did coccidian biology. I tried to learn something from each of them because I wasn't yet ready to take on the responsibility of graduate students and I did not think there was enough intellectual support in my department to provide potential graduate students in parasitology with the education they needed to be competitive for advancing when they completed. During my first 8 yr at UNM, 6 colleagues had a great influence on my continued growth.

In 1970, I attended the International Congress of Parasitology-II in Washington, D.C., and met Gerald D. Schmidt (1934–1990) for the first time, then a professor at Northern Colorado University (UNC) in Greeley. Gerry also received his Ph.D. from CSU (1964), but we had not overlapped; he and I became fast friends and spoke frequently by phone in the early 1970s. In about 1973 or 1974, he called and said, "Hey Don, let's go to Jamaica!" We accompanied a geology class from UNC to the Discovery Bay Marine Lab near Montego Bay, met Jeremy Woodley, then director of that world-famous lab where Tom Goreau had done his pioneering work on coral biology and systematics, and where his wife and colleague, Nora, continued their work; this was a life-changing educational experience. In the next 3–4 yr, we traveled several times to Jamaica and a couple more times to Belize. It was these trips, and my previous experience in Costa Rica with OTS, that hooked me on marine biology and the tropics. In about 1974 or 1975, Gerry called and asked, "Want to write a textbook together?" We had both used Chandler and Read's *Introductory Parasitology* (10th ed.), but Gerry said he was tired of it and thought he could write a better introductory text. On the advice of my colleagues at UNM and, because I was still untenured, I declined to co-author Gerry's new book, which was first published in 1977, as *Foundations in Parasitology*, with Larry S. Roberts. Now in its 7th edition, *Foundations* (Roberts and Janovy, Jr., 2007) is the largest selling parasitology text in the world. Win some, lose some.

Promoted to associate professor and awarded tenure in 1975, I immediately applied for sabbatical leave, as all new associate professors should. I spent 1976–77 in Texas. During the fall semester, I worked as a senior research scientist in the lab of Dr. Gilbert A. Castro, Department of Physiology, University of Texas Medical School, Houston, and, in the spring and summer of 1977, I was a visiting associate professor, Department of Microbiology, University of Texas Medical Branch, Galveston, with Dr. Edith Box. This was a productive 12 mo and, between the 2 labs, a dozen published papers resulted. I developed a lifelong friendship with Gilbert, his wife Georgia Faye, and their daughters, Theresa and Mitzi. Gilbert strongly reinforced the concept of "work hard and play hard" and, when I was appointed Scientific Program Officer of ASP he took me aside and said, "Make the damn meetings fun, Donald."

I returned to UNM in the fall, 1997, to resume my teaching load of 4 courses/yr and restart my fledgling graduate program

(see below). Between January and August 1978, 3 more colleagues were to significantly impact the final direction of my teaching and research for the next 25 years. Midway through spring semester, 1978, Dr. Clifford S. Crawford was finishing his final term as our departmental chair. He called me into his office one day to announce, “Don, you’re going to teach Invertebrate Biology in the fall.” My response was immediate, “No I’m not! I’m not an invertebrate biologist.” Cliff’s response was immediate, too, “I’m the chairman, you’re an associate professor, and you’re going to teach invert in the fall, got it?!” This was one of Cliff’s last acts as chairman before he returned to the ranks of the regular faculty in June and, although my knee-jerk response was negative, I never really thanked him for the direction he pointed me in for the long run.

Cliff was replaced as chairman in June by Dr. James S. Findley, a mammalogist who, unbeknownst to most of our faculty, had cut a deal with the Arts and Science dean before agreeing to take on the chairmanship duties. Jim got the dean to agree that he could hire another mammalogist in Biology. After Findley had moved into the chair’s office, he summoned me and announced he wanted to hire the new mammalogist as soon as possible, but before the majority of the faculty returned in the fall, and that he and I would constitute the search committee. The ad had gone to *Science* in mid-spring (also unknown to most of us), so the job applications were already arriving on Jim’s desk. We interviewed 3 candidates that summer and hired Dr. Terry L. Yates, a newly minted Ph.D. who had just completed his degree in Dr. Bob Baker’s lab at Texas Tech.

Terry was a dynamo; like the Energizer Bunny, he never ran out of steam, or ideas, or conversation, or ambition, and he was one of the most likeable humans one could ever meet, a true southern gentleman (from Kentucky). He and I became immediate friends and we agreed to merge, forevermore, the disciplines of mammalogy and parasitology at UNM. Whenever and wherever his students caught mammals, my students examined them for parasites. We co-authored papers and grant proposals, co-advised students, and went on field trips together (Mexico, Western United States, Japan, South America). Our families spent a lot of social time together, and sometimes we even vacationed together. We partied hearty together, our motto being, “anything worth doing is always worth overdoing!” His students learned the value and techniques of collecting parasites from the mammals they collected, and my students learned the critical value of collecting, preserving, and archiving the hosts and tissues from which their parasites came, and of vouchering—for the first time—protist-type specimens into nationally accredited collections (e.g., the Manter Lab, the USNPC; see Bandoni and Duszynski, 1988). Together, our students developed the concept of symbiotype hosts (Frey et al., 1992) and worked on numerous host-parasite co-evolutionary concepts (e.g., Reduker et al., 1987). This symbiotic relationship spread to other universities that have faculty who still do field collections, and it spread to other vertebrate disciplines beyond mammals. Terry did 2 rotations as an NSF program officer and he was the kind of person who could sell screen doors to the U.S. Navy Submarine Program. Thus, he was instrumental in influencing the NSF’s “value-added” concept in Biotic Survey and Inventory and Partnerships for Enhancing Expertise in Taxonomy grants programs to include, if not mandate, that vertebrate biologists who did collecting with NSF funds should always

include parasitologists as a value-added component of their proposals. I will always be grateful to Terry (1950–2007), who helped kindle my appreciation for field work and who taught me the goodness of killing rats. And I miss him very much.

Proximal serendipity

Bob Calentine taught me parasitology (1965) and made me go to graduate school. Wilford Olson accepted me into the CSU graduate program (1966). John Ubelaker tutored me in worms and how to be a graduate student during the last year of his Ph.D. program (1966–67). Bill Marquardt accepted me into his graduate program, taught me about the coccidia, and encouraged me to apply for the OTS Tropical Biology course in Costa Rica (1967), giving me my first experience in the tropics; he also accepted Lil Mayberry into his lab (1969) and, years later (1987), she appointed me to be ASP Scientific Program Officer. Gerry Schmidt (1974) was a catalyst for me to explore Jamaica and Belize, countries to which I later took many undergraduate and graduate students. Gil Castro (1976–77) helped me develop my experimental laboratory skills and taught me tons about physiology and immunology, knowledge some of my students later used in their work. He also taught me, as did Gerry Schmidt years earlier, to work on what you love, not on what others think you should work on. Cliff Crawford, as Biology chair (1978), mandated that I teach invertebrate biology, an assignment that led to my developing a Marine Invertebrate lab course near the northern Gulf of California, to which I also took many students. And Jim Findley (1978) had me serve on a search committee that hired Terry Yates, who later became my closest friend, colleague, neighbor, and confidant.

Distal serendipity

All of these good people had helped me focus my trajectory in both teaching and research by late 1978. I taught Marine Invertebrate Biology, taking students to Puerto Peñasco, Sonora, Mexico, for 23 years. I taught Tropical Biology, taking students to Jamaica and Belize for 25 years. Between 1,300 and 1,500 students got to experience these environments through my classes. A number of undergraduates and graduate students got the opportunity to accompany me, or Terry Yates, or other vertebrate biologists, on field trips to the tropics and elsewhere. And to complete the circle to CSU, 2 of my Ph.D. students (D. W. Reduker, 1983; J. K. Moore, 1988) later became faculty members there. It was the amalgamation of all these experiences that helped me develop a jack-of-all-trades approach to study coccidia and other parasites, later reflected by the graduate and undergraduate students who worked in my lab.

MENTORING STUDENTS

Beginning a graduate program

In 1972, 2 young men, Al Marchiondo and George Conder, took my parasitology class and lobbied to become my first graduate students. Initially I hesitated, not because they couldn’t do the work, but because I did not think I was ready, and I was not convinced that UNM Biology yet had the intellectual resources to support graduate students in parasitology. Al and George changed my life forever by helping me jumpstart my graduate program and my life as a mentor. They were followed

by 23 more students, who were among the most amazing graduate students in our department over nearly 3 decades (see <http://www.unm.edu/~eimeria/grad.htm>). It was an incredible honor and privilege to have taught these students. My deepest feelings as a faculty member from 1970 to when my last student graduated in 2003 involved my former graduate students; they all meant a great deal to me, although most never knew it during their tenure in my lab. It's funny, because when you have something for so long that you hold so precious, it's the toughest thing in the world to stop and let go. However, after my last 2 students finished in 2003, I knew it was time for me to move on, that the world was changing. I also knew the world of parasitology is in better hands because of these students. I say this because they have been amazingly productive in parasitology, having made 589 presentations at regional, national, and international professional meetings and having published >500 refereed papers and 29 books and book chapters. In some ways, it almost makes me feel guilty having had such a wonderful experience for so many years, because I came from a family who actually had to work for a living!

Three questions come to my mind from this experience: How does one get such good, productive students? Why did so many of them stay in parasitology? What are the qualities of a good mentor? Clearly, the answers vary from person to person. I can tell you what I think worked for me, but I can't tell you what might work for someone else.

How does one get such good students?

First, know the students before accepting them into your lab. Of my 25 graduate students, 12 were undergraduates in 1 or more of my classes, 11 I brought in to interview at UNM or I interviewed at regional or national parasitology meetings, 1 worked as a technician in Biology (5–10 yr) and was abandoned by another professor (she finished her M.S. with distinction), and the final student had corresponded with me for 5 yr before I accepted him (he finished his Ph.D. with distinction).

Second, I always looked for the diamond in rough, i.e., someone who may have flunked their Graduate Record Examination. Only 2 of my former students were straight-A students (G. Conder, J. Moore). Of the rest, I looked at their desire, at the twinkle in their eyes, but especially at their ability to juggle several balls at the same time, i.e., full-time students working 1–2 part-time jobs, doing community service, whatever.

Third, set ground rules early, but keep them simple. John Ubelaker “suggested” I join ASP during my first year as a graduate student at CSU. All of my students joined ASP or they left my lab. In fact, I still badger some of them today, especially if they are not still active in parasitology, about why they're not still members.

Fourth, strongly encourage them to work hard and long; if they're not in class or sitting on the job, they should be doing their research. Sleeping was an optional function in our lab and *vacation* was not a word in our vocabulary; we substituted *field trips* for that word.

Fifth, tell students to pay attention to details and write everything down; coccidia, for example, don't have many structural characteristics, so make very careful observations about the details (only 15 of my 25 students worked on coccidian for their theses or dissertations).

Sixth, have fun and do not hesitate to play as hard as you work. We always tried to follow the sage advice of that great American philosopher, Captain James T. Kirk of the Starship Enterprise, “Live every day like you're gonna die. Because you're gonna die!”

Seventh, let your curiosity dictate what you want or like to do, even if it's not fashionable, i.e., grant-worthy. Don't set out to “cure malaria;” instead, investigate problems inspired by your interest, even if no applied intent. This lesson I learned from Gerry Schmidt, who loved to look at and study worms just for the sheer joy of doing it.

Finally, try to make your hard work count for something at the end, i.e., presentable and/or publishable results, but, if you fail (a project goes belly-up), all is not lost; you've gained valuable experience and there are always projects to do in parasitology.

Why did many stay in parasitology?

Every one of us has our own way of responding to students, and my approach was molded by my experience and, to some degree, by those who mentored me. However, my objectives were quite similar to those of my mentor predecessors: to generate interest and excitement in my students for this wonderful discipline of parasitology. Thus, a good part of the answer is our discipline. Parasites are the best! I think it is impossible not to be able to generate interest and excitement in students for this wonderful discipline. I've often tried to teach them—and everyone else I've ever come in contact with—that you can use parasites as a model organism in all disciplines and areas of biology; from the movement of molecules to gene products; from discovery and biodiversity to ecosystem modeling of diseases across time and space.

The other part of the answer to the question is this Society. As Brent Nickol said in his Mentor Address (2001), ASP is one of the very few scientific societies that demonstrate a “meaningful dedication to the mentoring process.” This attitude must be treasured and nourished in perpetuity. This Society values students and makes them feel at home, and I have always encouraged, cajoled, chided, sometimes forced, students to attend both regional and national meetings every year. In fact, our regional groups cater almost entirely to students, giving them the opportunity to make their first real presentations in front of a friendly audience of peers and colleagues. I've never understood why some parasitologists, who purport to be mentors of students, would either not encourage or actively prevent his/her students from attending regional meetings simply because the “right” colleagues might not attend in that region or because it wastes time they could be working in the lab on the professor's grants. Get a life. Good teaching/mentoring goes beyond the field and lab experiences. Students must meet their peers and icons at other universities and in the profession. That's why annual meetings, both regional and national, are so important, and it's why I always made a special effort to make and help my students attend these meetings and to introduce them to colleagues when they were there.

What are the qualities of a good mentor?

Mentoring differs from person to person. I can't tell you what the “universal elements” of good mentoring may be; I can just

tell you what worked for me. The only “universal” is to give students the environment to enhance their own creativity. That is, provide the physical and financial support, i.e., the environment, for their scholarly development and let them go from there. Following is a list of qualities that worked for me, but may not be appropriate to everyone.

Direction: Managing your student’s progress can vary from complete (designing the research project and overseeing the student to its completion), to the minimalist approach as per Schad (2005), to somewhere in between. I agree with previous mentors who stated that some students are not always well served when they come into a lab with mega-grants and the advisor gives the student a certain part of the project to complete for his/her thesis or dissertation research. This approach may be better suited to technicians or post docs, because it doesn’t encourage independence or creativity. The question must be asked, is the grant principal investigator (PI) using the student to gain more for the PI than is gained by the student doing the work?

Loyalty: Loyalty is a critical component of being a good mentor, but it must be a 2-way street. Be loyal to your students and expect the same in return from them.

Genuine excitement: Never lose the wonder of searching for the world’s perfect oocysts or whatever it is you may be looking for and, if your excitement is real, it will be apparent to your students.

Notice their progress: Ignore much of what your students say, because they get caught up in the day-to-day trials of everyday life; however, always pay attention to what your students do.

New technology: Make sure they learn and know the newest techniques or developments necessary to what they choose to study. If you don’t know them, then be sure to engage and select faculty who do—the most appropriate members within your university, your most knowledgeable nonparasitologist colleagues—to serve on their graduate committees. Such colleagues can and will help them explore novel ideas or methods that may not yet be mainstream or fashionable in parasitology, and this is a good thing.

Freedom: Once they have decided on their research project, let them go; do not micro-manage or continually look over their shoulders. Let them develop into them, not into you. Let them develop their own intellectual properties; don’t think for them, let them do that and let them take over and do their thing, not your thing.

Family: Treat your students as family; welcome them into your home and comfort and encourage them if and whenever needed. All of my students have always been welcome at my home when I wasn’t married and at our home since I have been married to Lee. Our Thanksgiving tradition started early, with my first few students, when my mother, Martha, was still alive. She never cooked a turkey, but she would work for days to produce a banquet of specialty dishes that could feed 40, even though there were only a few students in the early days. And if you didn’t have 3 helpings you were being impolite!

Scientific process: Emphasize the scientific process and its completion, that all the knowledge they generate, all the cool things they do and find and learn are useless if no one knows about them. Thus, they must understand the importance to communicate these ideas to others outside the lab. And how do you

do this? Talking and writing, giving papers/posters at professional meetings (regional, national, international), and submitting manuscripts for publication. And, in both instances, make them deal with the feedback, positive and negative.

Multiple tasks: Students beginning their graduate studies may take months, or longer, to select a research project that is appropriate for them and their interest. Give new, beginning students simple research projects to work on while they are taking their classes and deciding on their thesis/dissertation research project. Start them with small, simple-minded projects. Alpha and beta taxonomy and simple surveys are perfect for this, and such projects make them broaden their horizons by doing at least 2 different activities at the same time. This gives them immediate hands-on experience of working with coccidian, or whatever parasites are at hand, gets them into the lab early, and quickly allows them to get to know their fellow students. They also feel as though they are making an immediate contribution to the overall effort of the lab. The lab is mostly about bonding and networking, and getting them in there and working early helps both efforts. Here are 3 examples from former students: Steve Upton worked on a millipede nematode (Upton et al., 1983) while doing life-cycle development work on a fish coccidium; Scott Gardner worked on coccidia of stingrays in the northern Gulf of California (Upton et al., 1986, 1988), while doing his dissertation work on the phyletic co-evolution of nematodes and their subterranean rodents in Bolivia; Wade Wilson helped with a major systematic monograph on the coccidia of primates (Duszynski et al., 1999), while doing his thesis on the bot flies of rodents on UNM’s Sevilleta LTER site. Most of the “side projects” assigned to virtually all of my students eventually got published, and these multiple activities and related experiences (multi-tasking before it became today’s norm) paid dividends when these students left my lab to apply for Ph.D. programs, or admission to professional schools, or in getting interviews for university faculty positions.

What about fires?

Finally, there must be flexibility between mentors and students. Just as mentors are different, so is every student different from the other. Some progress rapidly and seek or need little guidance, while others progress more slowly. Of the latter, some get discouraged, or just do not get it, and drop out. Others let the complexities of their lives get in the way or distract them and may continue on a relatively even keel, while making little or no research progress. Sometimes these students need a fire lit under them. Fires can manifest in the form of a simple discussion with the student, pointing out shortcomings at the lesser extreme, to defining in writing, weekly deadlines with the threat of dismissal from the graduate program, if these deadlines are not met, at the other extreme. Part of being a mentor is knowing the strategy that will work with which student, when it will work best, and having courage to do it. I think it is a mistake to keep even 1 student in your program for years beyond what is considered “normal” for your department and college or university. Thus, in my view, every mentor is morally obligated to regularly assess each of his/her students’ progress on a regular basis and, if that progress is unsatisfactory, a good mentor must do something about it.

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