

Surviving Professional Puberty in Marine Mammalogy: Things Mom and Dad Didn't Tell You¹

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The Society for Marine Mammalogy has a history of strong interest in attempting to provide guidance and support for its student members. I have been asked to provide some comments regarding traits I believe are necessary to enhance one's career in marine mammalogy. The recipe I provide is based on my work as a marine mammal scientist who has been involved with students for 20 years, and I am proud that about 40 individuals whom I have taught or for whom I have served on thesis or dissertation committees are present at this conference. This does not mean, however, that my opinions should be taken to represent the feelings and opinions of my peers. I simply offer some observations and thoughts regarding what appears to me to work.

On being a biologist....

"To be, or not to be: that is the question:" (Shakespeare, 1987, page 93)

Have you ever considered how you spend your day and whether what you do facilitates your development as a biologist? In this time of high speed information transmission, we often lose sight of the value of careful reflection (to be considered in later). Yet one trend that worries me a great deal has to do with how prospective biologists spend their time at work. One might well expect a biologist or biology student to spend most of his/her time studying living organisms--for students at this conference, that presumably means marine mammals. That time could involve studies of whole organisms, their ecology and behavior, their anatomy or physiology, their health, energetics, and nutrition; it could involve reading the literature, regarding both the species of immediate interest and other species for the sake of meaningful comparisons; the time could also be spent discussing salient points with others. But the point is that marine mammal biologists must spend significant time dealing with or better understanding marine mammals.

I meet many young people who spend far more of their time mastering analytical techniques that allow them to perform certain tests of data or assessments of samples. To be sure, a good biologist must master certain techniques, but there is a cost to becoming simply an expert in analyses, rather than becoming a biologist who uses analyses. Consider the outstanding scientists in our field. What makes them noteworthy? I submit that they are special because of the questions they ask---biologically meaningful questions that permit us to understand species biology better or to conserve populations and stocks optimally. Good science is far more than matching a set of data to a technique

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or cranking tissue specimens through a particular mill. Science involves understanding species (the ones on which you focus and others) sufficiently to ask questions that mean something.

So...if you plan to be a biologist, act like a biologist. Devote time, energy, creativity to biology more than just to analyses.

Role models I have known....

Many of us consciously or subconsciously use other people who have influenced us as role models. This is certainly appropriate, but too close an adherence to what works for others can be a trap. Each person is unique, and what works for one person does not necessarily work for others. So as you consider what attributes may merit emulation on your part, also consider your own style and personality. Reflect on the strengths of some of our society's recently departed heroes--Doug Chapman, Ken Norris, Bill Schevill, for example--and note how different they were, but how successful each person was in his own way. You, too, should be true to yourself and your particular strengths.

Having said this, it is also important to note that there are some general attributes that leaders in the Society for Marine Mammalogy possess, and indeed that leaders in science possess as well. One of my professional heroes holds the remarkable position of being the father of modern biology--Charles Darwin. In his self assessment in his autobiography (Darwin, 1958), he wrote the following (page 144-145; emphases added):

"Therefore my success as a man of science, whatever this may have amounted to, has been determined, as far as I can judge, by complex and diversified mental qualities and conditions. Of the most important have been---the **love of science--unbounded patience** in long **reflecting** over any subject--**industry** in observing and collecting facts--and a fair share of **invention** as well as **common-sense**. With such moderate abilities as I possess, it is truly surprising that thus I should have influenced to a considerable extent the beliefs of scientific men on some important points'"

Do you notice anything missing? Darwin never mentions intelligence or genius. Now don't get me wrong--Charles Darwin was a pretty bright fellow. But by his own admission, it was his other traits that allowed him to succeed so well. And his other traits are attainable by you. I love Darwin's assessment because it leaves hope for people like myself that the value of being unusually intelligent is over-rated!

Like Darwin, the leaders of the Society for Marine Mammalogy are characterized by attributes such as synthesis, creativity, passion for their work, curiosity, hard work, and long careers. Generally, they are good listeners who read a lot--in other words, they seek other opinions besides their own. And almost always, they make time to reflect, to think, to ponder---a truly important ingredient in the recipe for success.

Thus, as you consider attributes to develop or enhance in yourself, think of the features I have just listed. You don't need to be a genius to do well, and the specific ways you grow and develop will be unique to you and your particular strengths.

Perhaps most of all, be true to yourself. Many students feel guilty because they have the mistaken perception that they have somehow failed to meet the standards of their mentors and role models. In most cases, perceptions of this sort don't match reality. Be yourself, grow commensurate with your own strengths and abilities, and you will be a success.

Some other good traits along the way...

Here I'll resort to a bit of a listing of what I consider to be good ideas. Some have been mentioned above, and others are new to this essay. To avoid sounding too "preachy" I'll resort to quotations of folks more eloquent than I.

1) To quote an unknown author, "Ode to a Hermaphroditic Snail", be thyself. After some OBJECTIVE self assessment, lead with your strengths and shore up you weaknesses. If you are a poor writer, take a writing class because you will have to communicate your findings to your peers. If you fear oral presentations, force yourself to do them because you will need to communicate orally as a professional. You get the point.

One of the subtle reasons why objective self-assessment is useful is that you gain a true impression of yourself that can not be distorted by unmerited criticism. It is a fact of life that people will critique you and your work; by having a clear and accurate view of you can more easily weather and react constructively to such attacks.

2) Avoid "physics envy", defined as "the disease among scientists where the behavioral biologists fear their discipline lacks the rigor of physiology, the physiologists wish for the techniques of the biochemists, the biochemists covet the clarity of the answers revealed by the molecular biologists, all the way down until you get to the physicists, who confer only with God" (Sapolsky, 1997, page 157). What Sapolsky suggests is that we should avoid too great a reliance on reductionism in our approach to science. Instead, maintain a balanced approach.

3) If biology is your passion (as it should be if you are a biologist), have fun with it. Indulge in a little silliness, and show some emotion. In the words of Shannon Brownlee (1999, page 943) in her tribute to Ken Norris, arguably the best-known marine mammalogist of all time: "...the lesson I hold most dear from 20 yr of knowing Ken, I could have learned from Dr. Seuss. That lesson is this: These things are fun, and fun is good. If you have never done such things, you should." Brownlee goes on to remark that "Ken's genius sprang from is sense of wonderment and delight with the natural world." Delight, wonderment, fun...all are important attributes to foster.

4) Be opportunistic. When he was just 22 years old, Charles Darwin set off on the voyage of the Beagle, a trip that affected both his own life and subsequent scientific thought. That's being opportunistic! I see many young people plan their lives and careers so

tightly that they miss opportunities. While you are young, take calculated risks to become as knowledgeable and experienced as possible. It can make all the difference in the world.

5) Some of the most important skills are tough to learn. Among them are the following:

---learn to work well with others. The greatest advances in science are being made by teams whose skills and knowledge are complementary. If you don't interact well with others, your potential will be seriously limited.

---deliver what you promise, on time. Not many people do this--if you do, you will stand out!

---celebrate your field, and avoid envious comparisons. There are so many important questions to be answered by creative minds. Rather than wasting time bemoaning someone else's success, focus on the important questions you can address.

---learn to laugh at yourself. If you are anything like me, sooner or later, others will laugh at you. You might as well join the crowd.

---don't focus on the questions and issues of yesterday and today--be far-sighted.

For sale or hire, one marine mammal scientist. Marketing yourself....

All too often, people do themselves a disservice as they attempt to secure positions. It is truly unfortunate when this happens, especially when it can be avoided pretty easily. I offer a few practical suggestions for you. First of all, do not underestimate the importance of making a good first impression. As you develop a letter of inquiry, an application, or a curriculum vita, be *meticulous*. When I receive a letter in which there are numerous grammatical or other problems, I make the assumption that this person is equally careless with his/her science. Take the time to represent yourself well, right from the outset.

Some other suggestions include the following: Follow Darwin's formula of passion, hard work, creativity, reflection, and common sense. These fundamental traits, more than any gimmicks, will carry you far. Be of good character; there are lots of competent people who have not earned the trust of their peers, and such people have difficulty getting positions. Meet key people and get to be recognized by them; the fact that you are attending this conference shows that you already understand the importance of this.

Lots of applicants look the same on paper--good grades, good recommendations, good experience. Make yourself appear unique. If you are good at mathematics or chemistry, take extra courses. Perhaps you can even obtain a minor or second major; this will set you apart from the average biologist. If you have unusual research experience or rare analytical skills, note that in your curriculum vita. It is an extremely competitive world out there, and not everyone wishing to become a marine mammalogist will make it. But you can succeed, if you groom yourself carefully. Among the more important traits to

acquire, as noted above, is learning to think in the future. By being far-sighted, you will groom yourself for the directions that fields are heading when you apply for a job, rather than the directions fields have headed in the past.

Finally, most importantly, strive for excellence. Too many people settle for simply being good. You should become excellent.

Marine mammal scientists often care a great deal about the well-being of the species they study, and to some extent, many of these people entered the field in order to help conserve species or otherwise to make a difference. It has become a cliché that "you can make a difference". But it is also absolutely true. Consider Darwin, Norris, and other heroes to biologists in general or to marine mammalogists in particular. They made a difference in how we think about animals and their place in the world.

One of my favorite examples of somebody making a difference involves a non-scientist, Marjorie Stoneman Douglas. Her personal attributes---knowledgeable, passionate, persistent, able to communicate and interact well---allowed her to be a key force in the creation of the Everglades National Park. I highly recommend her book "The Everglades: River of Grass" (Douglas 1947) as a source of inspiration.

In summary anyone can make a difference if (1) truly motivated to do so and (2) equipped with the proper attributes. Don't let anyone tell you differently.

And in conclusion...

J.B.S. Haldane (1927) remarked that "the universe is not only queerer than we suppose, but queerer than we can suppose." To be one of the people who has the privilege of allowing our species to clarify biological questions and to understand linkages and trends among organisms, it seems safe to say that you should use everything at your disposal. Be bold and opportunistic; work hard; be passionate about your work; and do not settle for anything less than excellence. The secrets of Haldane's queer universe are not likely to be unlocked by wallflowers.

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