

Perspective: We Stand on the Shoulders of Giants — A Tribute to Long and Productive Careers in Science

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Abstract

One of the primary characteristics of practicing science is our reliance on the discoveries and insights of those that came before us. When embarking on a scientific research project we first consult our mentors and the available literature. We network with other scientists and form collaborations with others in our field. A long and productive career such as that of Angel C. Alcala, to which this journal issue is dedicated, is an excellent example of how important a career in science is to both the scientific community and the advancement of civilization.

Keywords: A.C. Alcala, careers, mentors, collaborators

Perspective and Tribute:

In my youth I was encouraged to do an assessment to help in my choice of careers. The two options resulting from the analysis suggested I would do best as a biologist or a priest! The choice was clear to me, but it was striking that the dedication and motivation needed for someone religious would be similar to that needed for a career in science. The late Oliver Sacks, a neuroscientist I had the pleasure of meeting at a book signing several years ago, emphasized the importance of science in one of his last essays (Sacks, 2019):

What we are seeing---and bringing on ourselves [via the digital age and social media era] ---resembles a neurological catastrophe on a gigantic scale.

Nonetheless, I dare to hope that despite everything, human life and its richness of cultures will survive, even on a ravaged earth. While some see art as a bulwark of our collective memory, I see science, with its depth of thought, its palpable achievements and potentials, as equally important; and science, good science, is flourishing as never before, though it moves cautiously and slowly, its insights checked by continual self-testing and experimentation. I revere good writing and art and music, but it seems to me that only science, aided by human decency, common sense, farsightedness, and concern for the unfortunate and the poor, offers the world any hope in its present morass.

So, what is it then that makes a career in science productive? Practicing the scientific method as we curiously explore our natural world is certainly key and, ideally, doing so should result in the sharing of the knowledge gained with

others. Publishing our results from scientific experiments, field and lab observations and various surveys in peer-reviewed journals is the primary way we convey the results of our study. Even though networking and open communication among scientists is important in our modern society, peer review remains essential. As Sachs mentions above, the reporting of science via social media is risky and is no substitute for the sound science found in peer reviewed formats. As an example, the COVID-19 pandemic has tempted the release of unsubstantiated information in social media on testing and vaccines which has led to confusion and poor treatment of the disease in some cases.

However, publishing results is not the only way we do science. Teaching the scientific method is a key contribution of scientists whether it be in the classroom, field, or laboratory. We may also involve our elementary school, high school, undergraduate and graduate students in the active execution of the scientific method through collaboration on projects. The publishing of field guides, textbooks, laboratory exercises and reference manuals is an important contribution to the scientific endeavor. Angel Alcala, for one, has been exemplary in serving in all of the above areas with distinction.

Careers in applied science are key to the contribution to society by scientists. Using the knowledge, we have gained through science for conservation wildlife management, medical care and technology are essential to the advancement of civilization. Those in all areas of science from basic research

and education to applied applications have a responsibility to provide and use scientific data for the benefit and good of all humankind.

Although we do have at least some control over the productivity of our careers, we have much less so on their longevity. We do not want to confuse our legacy as a scientist with our career longevity. An example of a short career with a lasting legacy is that of W.H. (“Buzz”) Weller. This high school senior died in the field at the age of 18 while collecting what he had learned was a new species of salamander from the mountains of North Carolina, USA (Adler, 2007). We think of Weller as the “Patron Saint” of our amphibian and reptile collection at the Cincinnati Museum Center and he is given as much recognition in Adler’s publication and a Peterson field guide (Conant and Collins, 1998) as any long-standing career herpetologist. Without the inspiration and dedication of W. H. Weller in building the herpetology collection in Cincinnati, it may well not have developed into one of largest regional American collections, including significant holdings of Philippine amphibians and reptiles. On the other end of the spectrum in length of careers is one of my mentors and member of my graduate committee, the late Hobart M. Smith (Hansen, 2012; Duellman, 2013).

Smith’s life passion, as does Alcalá’s, highlights the importance of long, sustained careers to the continuity and integrity of the science process. Smith received his Ph.D. under E. H. Taylor at the University of Kansas. Taylor himself is well known for his work in Philippine herpetology. An interesting collaboration in early 1930’s herpetology is that W. H. Weller in Cincinnati and H. M. Smith, a year older than Weller and an undergraduate at Kansas State University in Manhattan, Kansas, apparently knew each other, a relationship which later led to an exchange of specimens from their collections (personal communication with HMS). As an undergraduate I used Smith’s textbook on comparative anatomy and then, to my great advantage, he moved his career to my graduate institution and became instrumental in my thesis research. Dr. Smith’s letter of recommendation was key in my landing a first academic position (so I was told) and I used his ideas in building my own course in comparative anatomy. He continued as my mentor until he passed away at the age of 100. Because of his longevity I was able to have some of my students join him in the field in his late 80’s and we all remember fondly that opportunity. As the decline of anurans was being documented in the 1990’s, Smith was returning to field sites he had worked 50 years earlier and shared with me his concern about the apparent declines of many reptile species as well. This is the invaluable contribution of having long productive careers in science.

The overlap in years of our careers provides continuity which helps insure the future of science. Alcalá was mentored by W. C. Brown, another productive herpetologist working in the Philippines. In his memorial to Brown, Alcalá summarized their scientific collaboration as “probably the longest one between an American and a Filipino, showing that a common love for science can transcend racial and cultural boundaries” (Alcalá, 2004). Both Brown and Alcalá have mentored today’s herpetologists who are committed to the study of Philippine herpetology, including Arvin Diesmos, of the National Museum of the Philippines and his long term collaborator Rafe Brown at the University of Kansas. I am confident that the next generation of scientists will be just as productive and with great longevity as they stand on the shoulders of the giants of science. We give thanks to all these colleagues, their connections and collaborations, and at this moment particularly to Professor Emeritus Angel C. Alcalá!

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