

MENTORS MATTER

By David A. Watson, Ph.D.

I have a confession to make. Several months ago when I set out to write about science, I thought I could simply discuss the mechanics of how and why things work, without talking about the human aspect of scientific discovery. This was overly optimistic, and for that matter simplistic as well. While science at its most reductionist is coldly logical and regimented, in practice the process is subject to all the same pressures as any other activity requiring cooperation among individuals. A good example of this can be found in the teaching of science and mathematics and the training of new scientists. Whether the next generation of students becomes interested in science and technology as a career path is clearly in the hands of those who teach them. Ask any scientist how he or she ended up in this line of work and likely as not you will hear a story about one or more teachers who made a difference along the way. Here's one.

To understand better why teaching and mentoring matter so much to science education and training, let me first explain the process a bit better. In order to specialize sufficiently to design and build rockets that can fly to the moon or Mars, or synthesize a new drug that can lower blood pressure or cholesterol, many years of formal education are required. Finishing high school and college constitutes just the beginning; graduate school follows, with the goal being another degree, the Ph.D. It's often said that to complete a doctorate is to specialize to such a level that one becomes the authority on so small an area as to constitute nearly nothing at all. To put it another way, according to my brother to be educated is to discover how little one really knows. The Ph.D. requires, in the sciences, a couple of years of coursework followed by the completion of an original research project suitable for publication in the peer-reviewed scientific literature. The entire program of work requires the approval of a committee comprised of faculty members with expertise in the student's field of study. The entire process requires, in theory, 3-5 years, but in reality more like 5-7 years. After completing the Ph.D., most individuals obtain additional training through a postdoctoral fellowship, usually last from 2-4 years. It would be unusual to enter the workforce as a fully trained scientist less than 10 years after graduating from college. To persevere requires a great deal of dedication

and determination, not to mention some outside help. Yes, brains help, but to have help in navigating the rough spots, someone to cheer you on and sing your praises, that's critical.

I was lucky enough to receive such assistance.