Teach Your Children Well. . .

As I sit down to write this piece, summer is galloping to a close. To push the equine metaphor even further (perhaps too far . . .), I can already hear the hoof beats of a new academic year thundering their way inexorably closer, signaling a return to the rigors and routines of a new semester. At times like these, I tend to become somewhat sentimental, a sentimentality that is perhaps enhanced in this instance by the fact that one of the excellent articles in this month’s superb issue is by my very own first graduate student, who is now all grown up and doing wonderfully out on her own. With your permission, I will avail myself of the opportunity afforded by this editorial to spend a few paragraphs indulging my current reflective state of mind.

We learn many of the most important and useful skills that we retain through life by watching others perform them. Walking, talking, reading, writing, and relating are acquired, at least in part, by attempting to model the actions and aptitudes of grown ups or big kids. I submit that the process of becoming a scientist is similar to these other, more fundamental and universal capabilities in sharing their requirement for observation and imitation. Obviously, producing a scientist involves the countless hours of formal education, self study, and practical work that are necessary to develop a deep understanding of a field and its fundamental questions. These are all essential steps in the education of a scientific mind, but they are merely prerequisites for the creation of a successful independent scientist. The least tangible, but no less critical, component of the process of becoming a scientist is the identification of role models and mentors who, through their interest or example, help younger colleagues to navigate the intellectual, ethical, strategic, and bureaucratic complexities that must be overcome by anyone who hopes to establish a career in research.

Throughout our ascent of the academic ladder, we are rewarded largely for our individual achievements and abilities—incllect, insight, curiosity, creativity, dexterity at the bench, communication skills, and so on. Upon obtaining a measure of independence, however, we find that our success depends largely on a completely different skill set that is not taught as part of any established curriculum. Those of us who enter academia by becoming assistant professors, for example, suddenly find ourselves responsible for selecting the questions that our groups will pursue, identifying, attracting, and managing the students and fellows willing to devote their talents to the pursuit of those questions, finding the funds to support our fledgling laboratories, and figuring out how to get our papers published. New assistant professors are hired because they manifest promise in the individual pursuits of their graduate and postdoctoral work. In order to succeed in this new role, however, they must possess an innate ability to apply the same sorts of skills that are required to manage a successful small business.

Independent scientists need to know how to inspire rather than demand the dedication of those who work with them, to bring out the best in these individuals, and to recognize their own responsibility for the entire enterprise. They need to know how to identify good questions, how to formulate them in a manner that peer reviewers will find compelling, how to recognize a complete story, and how and where to advocate for its publication. They need to know how to get senior colleagues to read drafts of their grant applications and how to accept constructive criticism. They need to know what meetings to attend, how to present their laboratory’s findings, and how to get their work noticed. They need to know what opportunities will advance their science and their careers and which jobs, committee assignments, or service obligations are little more than distractions. The tools required to master these diverse tasks are not acquired in a classroom. Instead, they are absorbed by observing the positive (or negative) examples of our mentors, colleagues, and friends.

Many institutions and societies provide workshops for newly independent investigators that are designed to introduce them to the challenges discussed above and to provide them with strategies for surmounting them. These are valuable to a point and certainly worth supporting and developing. I maintain, however, that those who are concerned with ensuring the future success of each new crop of newly independent scientists can do no better than to provide them with the example and the mentorship that they need to internalize in order to thrive. Anyone who maintains an independent research operation is confronted almost daily with the evidence that the current scientific climate is difficult. Funds are scarce, competition is fierce, and gentility is often in short supply. Under such circumstances, it can be easy to lose sight of the fact that those who work in our laboratories do so not to advance our careers but to advance their own development as scientists. We need to take the time to foster in our students and fellows, both explicitly and through our actions, the intuition and self-confidence that they will require to make it on their own. Those of us who are fortunate enough to be indebted to the positive examples and supportive mentorship of senior colleagues need to repay that debt by serving in the same roles for those who now depend upon us.