

EDITORIAL

Teaching as THE Oldest Profession

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If you google the phrase “the oldest profession,” a Wikipedia page pops up highlighting the conventional meaning of this phrase (common since World War I): (https://en.wikipedia.org/wiki/Oldest_profession_%28phrase%29), but the site also lists teaching as the “oldest profession.” And why not? Humans aren’t the only animals that teach. This suggests that the teaching profession is much older than any other. Behaviorists define teaching as when an animal (the pupil, usually an offspring) acquires skills after observing the teacher (usually a mother) perform a behavior. The teacher performs this behavior in the presence of the pupil, and at some physiological cost to itself (Bradbury and Vehrencamp, 2011). Teaching can be considered an evolved trait when benefits gained by the teacher after a pupil’s learning are greater than any physiological cost to the teacher. These benefits are a function of how much better the pupil performs a task than others without training (Bradbury and Vehrencamp, 2011). There are clear examples of non-human teaching that fit the definition above; Bradbury and Vehrencamp (2011) describe them in termites, birds, meerkats and various solitary carnivores. Thus, we neuroscience educators practice a “profession” that probably evolved before humans, who have refined and greatly extended this ancient tradition on a grand social scale!

The *JUNE* wheel turns and this is my first issue as Editor-in-Chief of our Faculty for Undergraduate Neuroscience (FUN) journal. Previous Editor-in-Chief Eric Wiertelak moves to Senior Editor, Raddy Ramos joins the core *JUNE* editorial team as Associate Editor, and Fern Duncan continues her essential role as *JUNE* Producer. I have relied heavily on these three for direction, advice, encouragement and support as I begin to understand and execute the duties of my new vocation.

Since assuming the role of *JUNE* Editor-in-Chief, I have had several experiences that made me consider deeply our impact as educators. Two specific and recent personal events erased any doubts I may have had about devoting most of my professional life to neuroscience teaching. First, at lunch with a colleague, I expressed that my scientific productivity did not match the high level of training I received in rich and exciting neuroscience environments, especially as a Ph.D. student at the Marine Biological Laboratory and as a post-doc and research associate at Cornell. My colleague commented that my real impact was on the generations of undergraduates I have taught and mentored in 30 years at Cornell. He noted that a few dozen more scientific papers would never match the influence that my teaching had on shaping future science. A second and poignant reminder of our influence

on students came from the parents of a young undergrad who died recently of complications from lupus. Bruce Land, a Cornell engineer, and I both knew her as an excellent student in separate courses that we teach. When we learned she was sick, we offered her an amplifier design project she could do under our direction at home. We exchanged emails over several months to encourage and follow her progress. Suddenly, her emails stopped. Her parents expressed their appreciation that this project gave her joy and a purpose each day. It’s not often, thankfully, that we receive such a strong affirmation of our teaching and mentoring.

I want to mention some neuroscience educators who have recently been appreciated by our FUN community. Our *JUNE* “Editor’s Choice Award” honors authors who have submitted especially good papers. In 2015 we chose for “Outstanding Neuroscience Pedagogy” an article that describes the development of teaching activities for a freshman neuroscience class. It focuses on scientific grant writing to promote critical thinking and writing skills (Köver et al., 2014). Our award for “Outstanding Neuroscience Laboratory Article” highlights a digital laboratory module that introduces students to basic techniques in molecular neuroscience (Grisham et al., 2015). Also in 2015 at the Society for Neuroscience meeting in Chicago, FUN gave out faculty awards for Lifetime Achievement (Steven Zottoli), Career Achievement (Lee Coates), FUN Educator of the Year (Mary Morrison), FUN Service (Jennifer Yates) and FUN Mentor (Anthony Kline). See [<http://www.funfaculty.org/drupal/node/455>] for a full listing of past FUN Faculty Awards. These educators who have been publically acknowledged for creatively expanding the knowledge and life skills of our students are only the tip of the iceberg.

This brings me to the content of this *JUNE* issue. We present five opinion pieces on the following topics; training undergraduate and graduate students for outreach programs in Africa (Karikari et al.), an update on the exciting evolution of *Nu Rho Psi*, The National Honor Society in Neuroscience (Hesp et al.), an introduction to our new “Case Studies” feature (Wiertelak et al.), a useful guide to seeking faculty positions at PUIs (Ramirez), and a convincing argument for the inclusion of under-represented minorities into mainstream training programs (Vega & Colón-Berlinger). The main articles begin with a detailed analysis of undergraduate neuroscience students applying to osteopathic medical schools and their motivations for doing so (Ramos et al.). Four of these articles present or discuss the following student laboratory techniques or exercises: event related potentials using EEG procedures (Nyhus and Curtis), *in vivo* optogenetics techniques for the

student laboratory (Roberts et al.), student manufacture and use of EMG equipment to encourage interdisciplinary skills (Crisp et al.), and investigating neurodegeneration with commercially available mammalian neurons (Catlin et al.). Another article describes success in changing middle school students' attitudes about science in Ghana after participating in neuroscience outreach activities taught by undergraduate and graduate students (Yawson et al.). Descriptions of three innovative courses provide information for 1) implementing the federal "Brain Initiative" to instill core concepts and competencies using neuroscience content (Schaefer); 2) using the "C.R.E.A.T.E." method which focuses on a subset of scientific papers to teach scientific methodology and content in a "Pleasure and Pain" course to reduce student attrition (Bodner et al.); and 3) creating students' service based projects that address alcohol abuse in a Pharmacology class (Kennedy). Our new "Case Studies" feature presents the first of a series of case studies, "Nora's Medulla," as an ongoing theme to teach basic neuroscience principles (Roesch and Frenzel). We also present neuroscience book reviews of: LeDoux's *Anxious: Using the Brain to Understand and Treat Fear and Anxiety* (Cecala), *Presti's Foundational Concepts in Neuroscience: A Brain-Mind Odyssey* (Milar), and Watson and Breedlove's *The Mind's Machine: Foundations of Brain and Behavior* (2nd edition) (Johnson and Weldon). Finally, a technical report describes the construction of a "running

wheel" to monitor earthworm movements, opening up possibilities to bring more invertebrate lab exercises into the undergraduate behavioral neuroscience lab (Wilson and Johnson).

Let's consider ourselves active practitioners of the "oldest profession." Enjoy the articles in this *JUNE* issue as examples of faculty sharing their ideas to promote the best practices in neuroscience teaching. Consider submitting your own creative ideas and teaching developments to *JUNE*. Teach the teachers.

REFERENCES

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