Journal of Paleontology, 91(6), 2017, p. 1326–1327

0022-3360/17/0088-0906
doi: 10.1017/jpa.2017.100

JOURNAL OF PALEONTOLOGY
A PUBLICATION OF THE Paleontological SOCIETY

Awards and Citations

Presentation of the 2014 Charles Schuchert Award of the Paleontological Society to Shanan E. Peters

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Fellow paleontologists, I am delighted today to have the chance to say a few words about Shanan Peters. Shanan got an early start in paleontology, collecting with his uncle, Ken Karns, with whom he also developed an impressive museum. Shanan is such an avid naturalist—any of you who have been in the field with him may have seen him identify any plant, animal, or fungus in sight; manage to stay unbitten in the midst of a swarm of mosquitoes; or dive a couple of bodies' lengths to snag a beetle—that he could have gone in any direction in his career. We're fortunate he chose to focus on the paleontological and geological parts of natural history.

Sometimes people who find a passion early are poor students because they know everything already, or think they do. Not so with Shanan. From the time I first met him over fifteen years ago—shortly after which he asked me to give him a series of increasingly difficult exercises so he could teach himself computer programming (in the days before R and python, when we had to wrestle with C and FORTRAN)—he has never stopped challenging himself. But somehow he combines the humility of the lifelong student with something I can only call hutzpah. He simply cannot help being thrilled—in a deep emotional and intellectual sense—by bold ideas. The pace at which he generated them as a graduate student naturally led me to dub him "The Whippersnapper." But there has always been a firm foundation supporting all the what-if scenarios we have argued about over the years (often late at night over a bottle of Scotch): What if the Late Ordovician extinction episode were a spurious by-product of stratigraphic incompleteness? What if our perception of the Cambro-Ordovician radiation were distorted by a change in the evenness of community structure? What if, despite the legacy of the 1981 Sepkoski et al. "Consensus Paper," changes in biodiversity over the Phanerozoic were exaggerated by the quality of the record after all? What if, instead, both the record and true biodiversity were independent manifestations of a common underlying driver?

It is with this last what-if question that Shanan made his earliest big impact. I think he has provided the most compelling evidence to date of what has come to be known as the "common-cause hypothesis," showing, for example that large-scale temporal and spatial patterns of origination and extinction are not consistent with being mere artifacts of the stratigraphic record, but instead indicate that both taxonomic turnover and the architecture of the record share a common cause (or causes).

To develop and carry out tests of the common-cause hypothesis, Shanan built an impressive database and array of analytical tools that he collectively refers to as "Macrostratigraphy." I admit it took me years to grasp his innovative proposal to study stratigraphic units in the same analytical framework as fossil taxa, with rates of sedimentary initiation (akin to origination) and termination (extinction), but this proved to be a key insight that enabled rigorous tests of alternative hypotheses. This impressive effort had humble beginnings when, as a graduate student, Shanan assembled a stratigraphic compilation based on a crude tabulation of formation names in North America. (On this subject, I cannot resist a favorite anecdote. We worked together on the formation compilation, with me reading out and Shanan typing in relevant data from Grace Keroher's massive *Lexicon of Geologic Names of the United States*. We had agreed to skip formations with a stated thickness of less than 10 feet. So imagine Shanan's consternation when I came to the unit on which he had cut his paleontological teeth—and continued to study with Kennard Bork at Denison—and I read out from page four thousand one hundred ten: "Waldron Shale; Middle Silurian; Southern Indiana, west-central Kentucky, and central Tennessee … Thickness between 2 and 5 feet; average 3 feet." Sorry, Shanan, we can't include it. But The Whippersnapper wouldn't accept that, so he convinced me that he could specify dozens of localities he had personally visited where it was 12 feet thick or more. You might think he was bluffing. But I've played a fair bit of poker with Shanan, and, trust me, he doesn't know how to bluff. As with his research, he wins at cards by folding early with a weak hand and betting hard on a strong hand.) Anyway, Macrostrat has enabled a wide range of hitherto impossible analyses—especially when linked with the Paleobiology Database—such as assessing the spatial completeness of paleontological sampling, or Phanerozoic-scale changes in paleoenvironment in relation to extinction selectivity.

Shanan has made a big splash with Macrostratigraphy, but there's a lot more one could say. He's a fine geologist and teacher when he dons his boots and heads out to the field. (He was even able to teach the likes of me how to collect paleocommunity data.) His Ph.D. work documented increased evenness in community structure from the Cambrian to the Ordovician, and—importantly, given that we often wring our hands about the meaning of global diversity—documented that local diversity and abundance of elements of Sepkoski's Evolutionary Faunas closely match their representation

globally. And, with Bob Gaines, he has documented features of the Neoproterozoic "Great Unconformity" and has pursued the implications of this major episode for biogeochemical cycles and biological evolution.

One of the hallmarks of many fine scientists is to realize they have succeeded at something and move on to other challenges. Shanan could easily continue to make important contributions if he simply persisted in the same vein, expanding and refining Macrostrat. Instead, he recently took on a project more audacious than anything he's done before (and, given his general level of audacity, that's saying something). Working with computer scientists, he is leading an effort to develop a system—"PaleoDeepDive"—to automagically read and interpret the paleontological and geological literature and extract usable data, such as morphology and geographic and stratigraphic occurrence. The results so far are remarkable and very promising—for example a Phanerozoic diversity curve assembled in just a matter of weeks that strongly resembles previous multi-year efforts. I hesitate to prognosticate, but I think we're seeing an important part of the future of paleontology. But whatever the future holds, Shanan will be in the thick of it.

Members of the Society and distinguished guests, it is an honor and a pleasure to present the recipient of the 2014 Charles Schuchert Award, Shanan E. Peters.

October 19, 2014

https://doi.org/10.1017/jpa.2017.100 Published online by Cambridge University Press