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“Zen Ecology” and the Origin of Scientific Ideas

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Recent evidence from cognitive science validates an older perception that creative thinking in humans involves two distinct processes—one that generates a sudden, intuitive insight, followed by a second process of deliberate rational analysis that error-checks and develops the insight. As Scheffer et al. (2015) point out (see also Scheffer 2014), modern science stresses the second approach at the expense of the first. We are trained in a “scientific method” that is wonderfully efficient for evaluating alternative hypotheses against empirical evidence, but we receive virtually no training in how to generate novel ideas. Scheffer and colleagues argue that taking time off from focused work to let the mind wander aimlessly is essential to the creative process both in science and in the arts (and when done in a natural setting seems to contribute as well to overall mental and physical health; see e.g., Fleischner 2017). But how many of us are encouraged to take time off for walks or daydreams, and how many conferences schedule unstructured free time?

In 2012 we had the good luck to help teach a field course for the Tropical Biology Association (TBA; http://www.tropical-biology.org (http://www.tropical-biology.org)) at the Amani Reserve in the Usambara Mountains of northern Tanzania. Our co-teacher was the late Brian Moss, a retired lake ecologist from the University of Liverpool (see Jeppesen and Johnes 2016 for a lovely summary of his life’s work). Our course brought together beginning graduate students from European and African countries. The intent was to build connections and capacity and confidence for the students, beyond an introduction to local natural history, and this was done during a month of living together in Spartan facilities embedded in nature.

During the first week of the course Brian Moss led a “Zen Ecology” exercise. “Zen” refers here to what Zen Buddhists call Zazen—a practice of seated meditation that is intended to lead to insight (https://en.wikipedia.org/wiki/Vipassana) into the nature of existence (https://en.wikipedia.org/wiki/Shunyata). After a brief discussion with each small group of students, Brian asked them to leave behind digital cameras and cell phones and to wander individually into the forest, armed only with notebook and pencil. They were encouraged to engage directly with nature through their senses rather than through a device, and with no preconceptions about what they might encounter. When something caught their attention—a pattern of insect damage on a leaf, for instance—they were to observe quietly, then sketch what they saw, using words and arrows to clarify as they wished. In essence, this is meditative, open-minded observation of the natural world. Brian talks more of this approach in an essay in the International Society of Limnology newsletter (see http://www.limnology.org/news/silnews62.pdf (http://www.limnology.org/news/silnews62.pdf)), without using the term “Zen Ecology” (but he did use the term with the TBA students.)

For many students the experience was transformative: they had never before gone into nature without a goal or preconceived idea, and had never thought to use sketching as a way to see more completely. And when they returned and shared what they had drawn and experienced with the other students, all sorts of ideas and questions emerged spontaneously and intuitively. These at first tended to be vague, but as students talked among themselves (gently guided by Brian) questions emerged more fully developed. Some student research projects later in the course came from the Zen Ecology exercise.

Zen Ecology was a revelation for us as well. We had struggled over decades to find a way to help students master the entire scientific process, from generating questions to devising and testing hypotheses, and had long thought that starting with unplanned observation and curiosity was key. For years we tried the “fifty questions” exercise we had learned in Organization for Tropical Studies (OTS) field courses. In this exercise, participants go into nature and return with questions to share with the group. We had found, to our disappointment, that students often felt pressure to produce “clever” or “cutting edge” questions, and as a result to filter the thoughts that came into their heads rather than going into the experience with an open mind and heart.

We have found Zen Ecology less threatening than “fifty questions” for helping us attend to nature directly and completely, without barriers. For many people this exercise—contact with nature without the filter of devices or goals—truly seems to get at a wellspring of creativity. What do we all want, if it is not access to such a wellspring, a source of ideas that can be winnowed and refined into novel and interesting research questions?

You may recoil at the idea of drawing insect damage on a leaf, or drawing anything at all. You are no artist! Grit your teeth and remember this: the drawing is not intended as “art”. It is a private record that helps you solidify and remember what you experience; think of it as a visual diary or journal. Consider that sketching was an essential tool for recording impressions in the days before photography, and that naturalists in those days surely had the same distribution of “artistic talent” (and lack thereof) that we all now have. Most of all, recognize that sketching as a means of gaining “ownership” of an observation of nature has no substitute in electronic imaging, no matter how sophisticated that imaging is.

Since 2012 we have tried out versions of Zen Ecology with high school classes, undergraduate research interns, graduate classes, even groups of senior citizens (that moniker would include the two of us!). We encourage you whenever possible to try your own version. Try it for yourselves, and in your teaching and mentoring. Please share with each other (and with us) what works and doesn’t!

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