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Paige E.openhaver-Parry

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Seedlings depend on older trees, including those that have died, to survive.

Paige E. Copenhaver-Parry

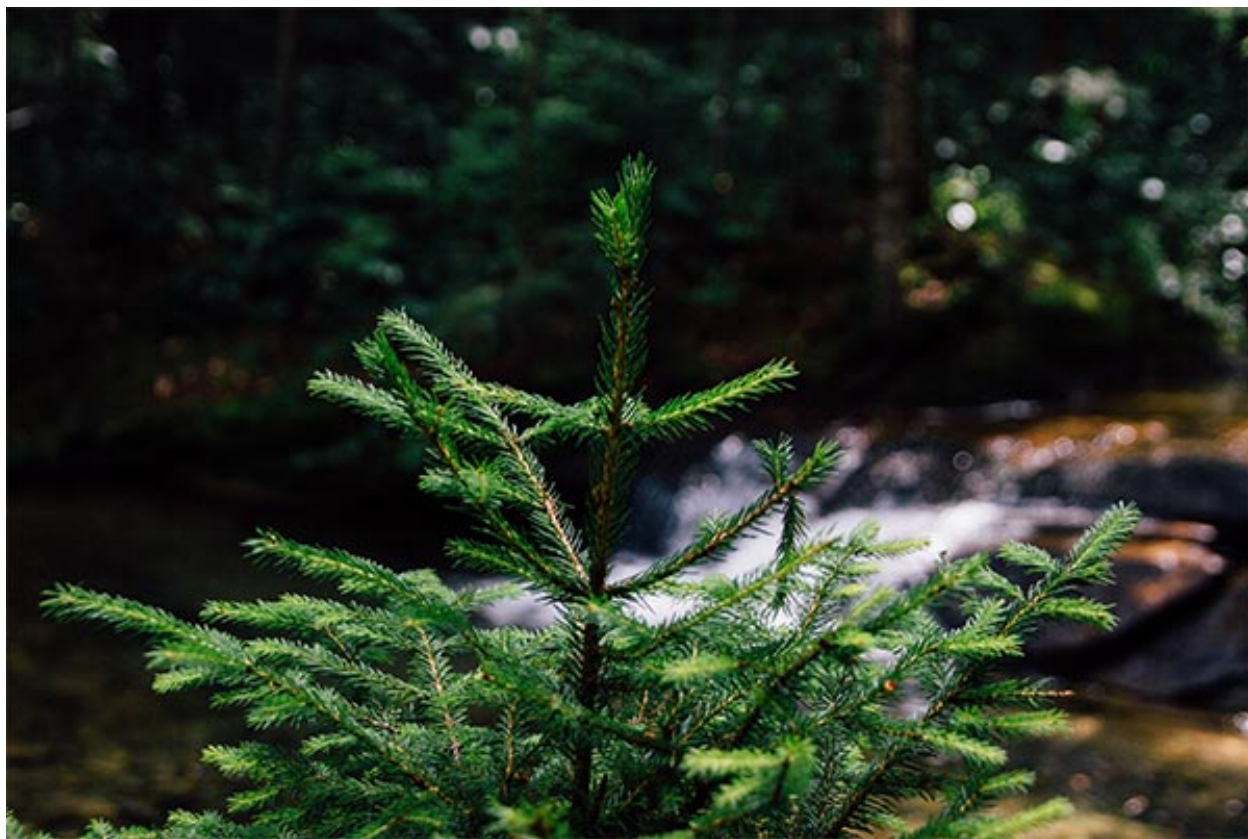
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EACH SPRING, I HAVE THE PRIVILEGE OF WITNESSING the miracle of new life as seeds that have buried themselves in the soil over the winter sprout roots, shed their papery coats, and stretch their bright green needles up toward the sun. My students and I spend weeks crawling across the forest floor – bellies, knees, and elbows scraping through the rich humus – as we identify, count, and measure hundreds of newly emerged conifer seedlings. Some of these seedlings will eventually grow into some of the largest trees in the world, but for now they stand scarcely two inches tall.

The journey to become a tree is not an easy one, and few of these seedlings will complete it. Our measurements show that only around fifty percent will survive their first year. In that time, they will be exposed to dry summer soils and scorching sun, competition from neighboring plants, cold winter frosts, and ravenous herbivores. With poorly developed root systems and limited biomass, many of these seedlings will wither away long before they see their second spring. Seedling survival is not a random process, and my students and I work to understand what determines whether seedlings wither or thrive. We measure things like shade, soil and air temperature, the density of understory vegetation, the abundance and proximity of neighboring trees, and soil moisture to help us define and predict the journey these seedlings take as they strive to grow larger and older in forests that are rapidly changing. The data that we collect tell us something about the future of the forests in which we work, but, as so often occurs when we carefully read nature, God’s “second book,” the data also teach us beautiful lessons about the patterns that God has so thoughtfully woven throughout all of his creation.

As an ecologist, much of my work requires me to identify patterns. I look for patterns across individuals, populations, and landscapes. I search for trends in data using the tools of probability and statistics. Once I identify meaningful trends, I work to understand what they tell me about the processes that generated them. For example, the patterns recorded in tree rings tell a story about how a tree’s life was shaped by changes in temperature, precipitation, and competition from year to year. Ecologists use the tool of inference to decipher the processes that underlie all manner of natural patterns. I believe that God gave us this inferential ability so that we can recognize and understand the many patterns that he has scrawled across diverse components of creation, extending from nature to humanity. God has repeated the lessons from his word in so

many different places that we may have the opportunity to learn of him from everything that we might study: “Ever since the creation of the world his eternal power and divine nature, invisible though they are, have been understood and seen through the things he has made” (Rom. 1:20).



Photograph by Andrew Spencer (public domain)

The patterns we see in seedlings have taught us that independence is a myth and that the community in which an organism finds itself has much to do with its ability to grow and thrive. Similar to the scattered seeds in Jesus’ Parable of the Sower recorded in Matthew 13, the location in which a seed lands does indeed determine a great deal of its ability to germinate, grow, and survive to become a tree. We’ve learned that the more a seedling is crowded by shrubs, ferns, and other understory plants, the less likely it is to survive to its second spring, but seedlings that germinate on logs provided by their deceased ancestors have a better chance. These logs help hold moisture where shallow seedling roots can access it and provide vital nutrients that were for so long bound up in the tissues of large, old trees. We’ve also learned that climate – air and soil temperature, precipitation, and soil moisture – has little to do with the germination and survival of seedlings that grow beneath the canopy. The most important determinant of seedling success appears to be the density of the canopy above it, which is provided by larger trees that have survived the journey to the top of the forest. While we’re still working to quantify the processes by which overstory trees in our forests benefit seedlings on the forest floor, we know that they greatly influence the amount of light a seedling receives. Too much light, and a seedling will wither and die; too little light, and a seedling will be unable to grow. Ultimately, we’ve learned that for a seedling to survive, it requires just the right amount of help from larger, more mature trees in the stand as well as a boost from the fallen trees that have come before it.

THIS IS A PATTERN THAT ECOLOGISTS FIND repeated again and again throughout nature. Organisms exist in carefully organized communities, and the collective structure of the community determines the fate of every individual that exists within the community. God has used the patterns of the natural world to teach us not only that communities are indispensable but that the specific behaviors and structures of a community shape individual journeys. As it is with trees, so it is with communities of faith.

In Christian tradition, the community of believers, including those living on earth and those in heaven, is referred to as the communion of saints. This is a central theme in church doctrines extending across denominations, in recognition of the importance of community for a life of faith. The beauty of this community lies in its structure, which is characterized by diversity of experience, maturity, and ability. This diversity ensures that, in times of fragile faith, believers have the protection and wisdom of the community “to provoke one another to love and good deeds” (Heb. 10:24), and the legacy of faith and the prayers of those who have come before them. Just as seedlings require the help provided by canopy trees and fallen logs to survive the journey to adulthood, so too do Christians require the communion of saints to grow toward spiritual maturity. Thanks to the communion of saints, when the scorching sun shows its face, it is just enough to help us grow, and not enough to cause our faith to wither.

Perhaps one of the most beautiful truths of this community is that every individual, whether weak or strong, is required; and in fact, “the members of the body that seem to be weaker are indispensable” (1 Cor. 12:22–23). Just as the fate of the forest relies on the success of fragile seedlings, God often uses the most unlikely individuals for his most significant work.

In nature, barring substantial human interference, these processes – seedling germination, the buffering and shading effect of canopy trees, the death and decomposition of large, old trees – play out effortlessly, ensuring that healthy forests persist. In human communities, nurturing the structure and behaviors that ensure a vibrant, supportive community requires intention and choice. Intentional or not, our mere existence inevitably shapes the communities in which we live. And may we find joy in this reality, recognizing, in the words of Pope Francis, “How beautiful it is to support each other in the wonderful adventure of faith!”
