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Editorial

More than a Repository for Dead Bodies - Making Natural Science Museums Relevant for the Next Generation

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Editorial

When baby boomers think back to their childhoods, they can probably recall a tree house, a boy/girl scout camping trip, family picnics, or a fleeting passion for fishing, biking, hunting, or horse-riding. In today's world, these baby-boomer parents are rightfully reluctant to give their children unsupervised time outdoors, due to the dangers from global threats or distrust of strangers. Most children know more about the complexities of Nintendo games than about their food chains. Those of us involved in science education recognize the need to reverse this trend. Whereas parents and teachers cannot take on the national challenge of science education on their own, science museums can play a big role supporting the reversal of science illiteracy.

It's no secret that the effectiveness of formal science education in the U.S. has been on the decline for some time. On average, Americans spend less than 5% of their lives in the classroom. Statistics indicate that our K–12 science education lags behind many other countries and despite amazing new technologies and a steady stream of brilliant graduate students, America's science literacy is waning [1]. Our science education has become the butt of late-night talk show jokes, such as this bit from Jay Leno: "According to a study by the National Science Foundation, 70% of Americans do not understand science. Here's the sad part: 30% do not even know what 70% means." On a brighter note, informal science education, where students learn outside the classroom, is proving to be increasingly effective, and museums are at the forefront of this movement. More Americans visited museums in 2012 than attended a sporting event. To keep visitors engaged, these institutions now provide educational gaming, after-school science programs, and virtual expeditions that link classrooms to scientific research. Not only are kids staying connected, they're learning scientific concepts and understanding scientific process. Yet public perception still tends to categorize science museums as dusty places filled with dead animals in jars and artifacts from ancient explorations.

A recent book, Last Child in the Woods- Saving our Children from Nature-Deficit Disorder by Richard Louv analyzes the societal problems that have arisen in the last generation of youth who have essentially lost contact with natural science. Louv quoted a fifth grader, who claimed, "I like to play indoors better 'cause that's where all the electrical outlets are." The author cites recent studies where outdoor education programs provided important therapeutic value to troubled youth, significant reduction in symptoms of attention-deficit disorder, and statistical gains in academic grades, problem solving and test scores. We may not feel safe offering young children free range of the outdoors in this day and age of urban dangers; but as parents, we need to seek ways to offer nature to our children as a critical part of raising healthy kids to become informed citizens. Science museums can give kids and families a renewed enthusiasm for nature…. Yes, looking at dead things in jars, that represent the evolutionary history of our planet, but also engaging in an "oh Wow" experience about the amazing ecosystems on our planet. Exciting new studies show us the benefits for youth education- biological, cognitive, and spiritual- when we give them the gift of nature.

What would it take for American science museums to overturn their dusty stereotype, to compete with malls and movies? What would it take for science museums to become more relevant? Confronting some of the planet's most critical issues, such as climate change and loss of biodiversity head-on might be a good start. So would dedicating a portion of their budgets and exhibit space to engaging the public in the true facts about sea-level rise and ocean acidification. Imagine if every science museum brought young people into direct contact with practicing scientists, so they could see that they're not geeks in white coats, but normal human beings helping to answer fascinating questions and resolve some of the most pressing issues humankind has ever faced. What if science museums engaged their local communities in monitoring invasive species using mobile apps, and surveyed biodiversity in native trees (versus exotics) so that more people could learn about, and appreciate, what lives in their own backyards? What if all museums created action plans to empower people to help reduce carbon dioxide emissions? Many museums are inspiring their public in new and creative ways, but we can and should be doing more. By becoming a forum for community involvement and by using the hooks of technology, exploration, and sustainability solutions to inspire science literacy, museums have as much power to change the world as any technological innovation.

Developing a funding model for such innovative approaches seems a necessary first step. In the business world, Benefit Corporations (B-Corps) include an element of sustainable operations as an added value for shareholders. Instead of offering stocks with monetary remuneration alone, B-Corps, such as Seventh Generation, Patagonia, and Bert's Bees, also commit to creating positive environmental and societal impacts. What if all science museums followed this model (maybe calling ourselves B-Muses) whereby a

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significant component of each museum's portfolio reflected relevant sustainability education and research initiatives? In addition to timeless exhibits about biodiversity, adaptation, or the aerodynamics of flight, benefit museums would dedicate a portion of their floor space to relevant sustainability issues and solutions: the decline of Monarch butterflies due to habitat alteration, ocean acidification and loss of coral reefs, or the challenges and benefits of renewable energy technologies.

When I was in college, most of my classmates were dedicated to making our environment cleaner and insuring that the next generation had clean air, water, and natural landscapes to enjoy. Oh the power of youthful optimism and energy! We had hopes of stopping rainforest degradation, reversing coral reef decline, saving endangered species, and ensuring clean air for everyone. Thirty years and thousands of eager graduate students later, the planet has lost more than 50% of her primary forests; atmospheric carbon dioxide now exceeds 400 ppm; and 70% of coral reefs have been destroyed. In short, the best efforts of our brightest and most dedicated minds have failed to stop-much less reverse-global environmental degradation [2]. Clearly, even in this age of astounding technological achievement, scientific innovation alone is not enough to change our current course. There is a critical need to alter the way in which science serves society- and the best place to start is with our youngest generations through the credibility of science museums [3]. Of course, natural science doesn't have to be, nor should it be, all gloom-n-doom. Perhaps the most important message benefit museums can convey is that all is not lost, that each one of us has an active role to play in the finding solutions to the issues we face.

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