

Combining Microbiology with Other Interests: Hobbies, Holes, and Hollywood

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Author

Hazel A. Barton

Northern Kentucky University

At some point in their microbiological career, everyone wonders if there is something else they'd rather be doing. Even the greatest microbiologists must have gone through a difficult period in their research that led them to consider, however briefly, the prospect of an alternative career. Or perhaps you've become so engrossed with another aspect of your personal life, you've wondered if it would be possible to somehow combine this interest into your research. My personal interest has always been caves and cave exploration and, during moments of doubt, I've wondered if I would be happier leaving research and caving full-time.

Since I remember coming up with my first research question at age 6 (aimed at understanding how the shape and color of peas is changed through digestion), I wanted to be a scientist. While biology fascinated me at school, it wasn't until we carried out our first microbiology experiment when I was 14 that I found my calling in life: microbiology research. At about the same time, I took part in an outdoors course that included a trip to explore a local cave. While I remember most of my peers being terrified, I was absolutely captivated. Caves provided the ability to explore the unknown and travel to places that no one had ever been before. Despite my mother's best efforts to encourage me in more "lady-like" pursuits, I was soon a fully fledged cave explorer, albeit one with the ability to knit!

As I continued to follow my passion for microbiology, I progressed through undergraduate and graduate school. During this period, my caving exploits became a topic of much discussion within my graduate department, especially when I would show up at the lab covered from head-to-toe in bruises, cuts, and scratches. It also became a big discussion point between me and my advisor: I felt that cave exploration helped me relax and keep a perspective on my Ph.D. work, he felt it was distracting me too much from my research. It was, however, possible to keep a balance between personal interests and graduate school, provided I kept focused on my research, worked hard, and understood that school always came first.

Things started to change regarding my interest in caving when I began working as a postdoctoral fellow with Norman Pace at the University of Colorado, Boulder. Throughout my Ph.D. in medical microbiology, my caving skills were merely a distraction, in Norm's environmental microbiology lab, they were an asset; the geology and hydrology of caves that was essential knowledge as a cave explorer helped me understand rock transformations and geochemistry and why certain microbial activities occurred in one area of a cave and not the other. Suddenly the conversations I was having with my boss were not about my "distracting" cave exploration but why I hadn't already used my caving knowledge to explore some outstanding questions in microbial ecology. Suddenly a whole new frontier appeared: it would be possible to combine my love of caves with my love of microbiology.

While this may appear as the holy grail of research activities for a number of microbiologists, especially those of us who like to get out of the lab once in a while, there are significant issues to consider, including whether you want your pastime to become your job. By using caves as research sites, it would forever change how I perceived caves and turn caving expeditions into

work trips—and nothing has the potential to suck all the fun out of something as turning it into work. But just as it's possible to juggle graduate school with personal interests, it's also possible to take advantage of the skills and knowledge we accumulate from our hobbies and use them to push our research in new and exciting directions. Again, it is important to retain balance and leave work behind when you play—that weird goo floating on the water in Grayson-Gunner Cave will always just remain weird goo, despite any temptation to carry a sampling vial.

It is also important to consider the perceptions of fellow scientists in your research field. While knowledge and skill from your pastime can give you a great advantage over your scientific peers and improve the significance of your research, it is, however, not an excuse to go have fun. It is critically important that the research questions you are asking are appropriate and relevant. In my case, caves provide a unique environment in which to ask questions regarding subsurface geomicrobiology and the ability of microbial communities to survive without significant energy input from photosynthesis. Therefore, caves provide the model with which to address an important question regarding microbial ecology. They do not represent a model in search of a research question. Therefore, before combining your personal interests with your research focus, you should ask yourself "... what's the question?" If nothing immediately pops into your head, then stick to your hobby simply for the joy it brings to your life.

The majority of the general public perceives scientists as geeky people who wear lab coats and glasses and don't have an adventurous bone in their bodies. This is a far from accurate stereotype and obviously not true of microbiologists; we invented beer after all! However, if you do manage to combine your hobby with your research, you stand the chance of bringing a new and exciting aspect to microbiology and attracting some media attention. Not long after I'd started combining my research with cave exploration, Hollywood came calling. I was approached by a film company that made IMAX movies, an immersive experience where the audience is placed very close to a large screen so that the image fills their entire field of vision and gives them a feeling of "being there." Making IMAX documentaries is a very specialized field, requiring very large film and subsequently a very large and heavy camera. I was contacted by one of the best IMAX documentary companies, McGillivray Freeman Films, who were looking for a cave scientist on whose research they could base their documentary, *Journey into Amazing Caves*. I was pretty reluctant to believe that they would really be interested in me, until a FedEx courier appeared at work bearing an envelope with a plane ticket to Greenland.

While I will openly admit that being involved with the production of a documentary is fun and exciting, it is not without its inherent pitfalls. As a scientist, becoming involved with the media has the potential to damage your scientific credibility, through perceived or actual misrepresentations of the research that you carry out. My involvement in the IMAX movie has been in turns very positive, for example when looking for a job; but it had a negative effect when I attempted to obtain research permits for sensitive cave locations. The problem is that any media company, whether film or magazine, generates income based on their ability to sell their product and you become an integral part of that product. The temptation is therefore to ask you to make what you do more "exciting," but this is a hazard with the potential to undermine your scientific integrity and misrepresent your hobby. You may be asked to perform an experiment in a certain way that is visually more "pleasing," but this may backfire on you if you're seen doing something rather bizarre with a sampling bottle. Rather, it is your job as the scientist to find the excitement within your research and explain this in layman's terms, not only to the reporter, but also to the general public. Even if this does mean learning to trade terms such as "molecular phylogenetics" for "special chemicals," resulting in a fairly bad teasing from your coworkers. If you are a good communicator, it is possible to maintain your integrity within the scientific community and also bring the excitement of science and microbiology to a wider audience. You'd be surprised whose

lives you touch through the revelation of how exciting research can be and what it truly means to be a scientist.

The lines that were historically drawn between the scientific fields are blurring as the questions we ask begin to cross disciplinary boundaries; for example, my cave research involves chemistry, geology, and mathematical modeling. In a similar way, the skill sets of successful microbiologists are beginning to expand beyond traditional lab techniques, creating room for researchers who can bring new directions to microbiology.

In summary, combining hobbies with your scientific endeavors is a risky proposition, with respect to your legitimacy within the scientific community and also the potential it has to take the fun out of something you truly enjoy. On the other hand, by asking questions that no one has been able to ask before, you have the potential to positively impact both your hobby and science for a broad audience. It is hard work, requiring a delicate balancing act between your personal and professional life, but for me it has been a very rewarding experience.