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Spring 4-16-2020

### John Aber: Professor of Natural Resources and the Environment

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#### Recommended Citation

Casellini, Brigid C., "John Aber: Professor of Natural Resources and the Environment" (2020). *Inquiry Journal*. 16.

[https://scholars.unh.edu/inquiry\\_2020/16](https://scholars.unh.edu/inquiry_2020/16)

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## Mentor Highlight

### John Aber

—Brigid C. Casellini

John Aber is a professor in the Department of Natural Resources and the Environment at the University of New Hampshire. Below is a correspondence with Dr. Aber about his own research and his mentoring experiences with undergraduate students.

***Inquiry:*** What is your research focus? Did your undergraduate studies point you toward it? What interests you most about it?

For the last ten years, my research has focused on sustainable agriculture, and especially on supporting the viability of organic dairy farms in New England. My interest in the topic goes back to the first Earth Day in 1970, when that event catalyzed my switch from studying computer science to studying environmental science. In the '70s, sustainable agriculture, as we now call it, was a hot topic, and switching to low impact, organic methods was popular. However, I ended up doing thesis work on forest ecosystems, and focused on that for nearly thirty years, studying the impacts of clearcutting, acid rain, and climate change.

Agriculture remained an interest, however, and I continued to follow efforts like the ones at the New Alchemy Institute, located on Cape Cod, near where I did a post-doc at the Marine Biological Lab in Woods Hole. New Alchemy built what they called “The Ark,” an attempt at a self-contained crop and fish production and waste composting system, closing the loop for agriculture by matching composting of wastes with regeneration of nutrients for crops. Interestingly, Gary Hirshberg, later CEO of Stonyfield Farm, and an energetic supporter of sustainable agriculture, was one of the founders of New Alchemy. Completing the circle, Stonyfield was one of the earliest supporters of the Organic Dairy Research Farm at UNH, which has been in turn the location for many student research projects.

Students have had a lot to do with the re-emergence of my interests in sustainable agriculture. Enthusiasm for this topic among today’s undergraduates is contagious. That enthusiasm also makes it easy to recruit talented undergrads to work on projects like those at the Organic Dairy Research Farm.



John Aber at UNH's Organic Dairy Research Farm. *Photo credit: Jeremy Gasowski*

**Inquiry:** What is the purpose of a mentoring relationship? What should the student and you gain from it?

Mentoring should foster one of the most important and supportive relationships for undergraduates. First-year students come to us full of enthusiasm and energy, and that energy is a constant source of inspiration for myself and other faculty. They also tend to come with a wide and somewhat unfocused range of goals and ideals and passions. Mentoring, perhaps like parenting, can be a process of helping and guiding self-discovery. Questions I often ask include, "What part of your academic life at UNH is the most compelling for you?" and "What do you find easiest to do—what comes naturally?" Often this leads to subjects unlike the first declaration of a major. I remember the student who felt he had to major in a science but had arranged a full summer immersion in German language and culture and truly enjoyed his German classes. I counseled that he switch to a German major. He did.

These four (or so) undergraduate years are perhaps the one chance for students to find the path that is most fulfilling and offers the best chance for professional satisfaction and success.

**Inquiry:** Please describe one or two memorable mentoring experiences or mentees.

There are so many. The first time I taught Introduction to Environmental Science at UNH I had just landed a USDA grant to study at the Organic Dairy Research Farm. I went into the class that first day and mentioned that there would be opportunities for student research. Six freshmen students came up after class and asked to take advantage of that opportunity. I involved them all, and they all went on to present at the Undergraduate Research Conference (URC) that same year. Three now have master's degrees and one is completing her PhD. I was able to work with them throughout their undergraduate years. It is great to see them succeed.

Mentoring exceptional students is really an easy task, as they are so motivated and bright. Jacqueline Amante is one example I use when recruiting students to UNH. She was my advisee, and she really made the most of her UNH experience. She also asked about research experiences in her first year in the environmental science major and went on to complete two independent research projects and presented at the URC in all four years, winning prizes for her presentations in two of those years. Jacki also studied abroad in Italy and landed a summer National Science Foundation research project in Idaho, among lots of other activities.

Another amazing student who I actually helped mentor out of environmental science and into environmental engineering, was Katerina Messologitis. As an undergraduate, she led a team to do work in Africa to develop a sustainable, clean water supply at the village level. Beyond the



John Aber with Matt Smith, who Aber describes as the "heart and soul" of the composting project at the Organic Dairy Research Farm for many years. Smith completed his PhD in 2016. *Photo credit: Jeremy Gasowski*

engineering aspects, Katerina and her colleagues approached a number of funding sources and received financial support for the work. Amazing to see undergrads being successful at fund-raising.

Much more could be said about both of these students.

Perhaps mentoring students who are less self-directed is more of a challenge, but this might be more rewarding as well. One student comes to mind who was excellent in class work, but ill at ease in conversation, and unconvinced of an ability to succeed. Building confidence in mentees, and helping them realize just how special they are, can be as important as ensuring academic advancement. This student has become very successful at both the undergraduate and graduate level.

***Inquiry:*** Please describe any difficulties or problems you have had in mentoring undergraduates.

Undergraduates, to me, are adults in the making. College life can be stressful in many ways, and students will often face challenges for which they are not fully prepared. These can be academic, financial, or personal. One constant source of care, for me, is to keep the mentoring relationship professional. I try to keep students focused on moving ahead and solving those problems in the academic realm, and maybe in the financial realm in terms of locating jobs, grants, financial aid, etc. By building confidence in this way, it seems that some of the social side of life improves as well. I never ask about anything outside of academics. If a student raises concerns that I am not trained to handle, they can be referred to the many professionals on campus who are. These are your students and advisees—they are not your friends.

The other side of that is talking openly and supportively with students, to gain their trust, so that honest discussions about current and future plans can be substantive and helpful. Building this kind of trust is one of the most satisfying parts of being a faculty mentor for me. A university can seem chaotic and unpredictable to undergrads. Having at least one consistent and hopefully helpful relationship with a mentor seems to be helpful—at least that is what I hear from students.

***Inquiry:*** What advice or tips would you give a faculty member new to undergraduate mentoring?

Remember that these undergraduates are still partly children as well as partly adults. They need support, honest advice, redirection when you think it necessary. I try to listen, to be receptive, to create an informal and supportive environment, and to truly enjoy the process. Your advice will not always be heeded, and that is as it should be. You really don't know what will be best for each student, and giving advice can be one of the most fraught experiences. Still, it is a great process and well worth an honest effort.