SECOND JOBS

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My knowledge of finance is minuscule at best, but I do buy the *Wall Street Journal* on the weekends for the newspaper's coverage of cultural topics. In a recent *WSJ.Magazine*, there was an article by Katy McLaughlin (2011) about a neurologist/chef. Entitled "Cerebral Palate," it dealt with the career of Dr. Miguel Sánchez Romera, an Argentinean who has spent the greater part of his adult life in Spain. He is now living in New York, where he just opened a new restaurant that is considered the pinnacle of haute cuisine. Until 2009, he had a medical career in Barcelona treating patients with epilepsy and Alzheimer's disease; in addition he was chef/owner of a restaurant that earned a Michelin star just two years after it opened. (This is apparently a big deal in the culinary world.)

It is for articles like this that I buy the *Journal*. Otherwise, I would have no knowledge of restaurants that serve, as this one does, a 12-course tasting menu that costs $245. It is probably worth the price, because Romera has a unique approach to cooking, one that is very much tied to his medical specialty and that's dubbed "neurogastronomy." McLaughlin (2011) describes one of her experiences dining with Romera:

> I was starving when we started, but by the end of the tasting, I was sated, stuffed even. Amazing, considering that I'd not eaten a single bite of food and consumed almost no calories. The chef's entire presentation consisted of multicolored waters, served in tiny cordial stemware, warmed to just over body temperature and flavored with ingredients he'd bought at the farmer's market. (p. 44)

Romera explains this phenomenon by noting that we eat with our brains as much as with our stomachs: the flavors trick the satiety system in the hypothalamus.

At his restaurant Romera does serve real food and not just tasty water, and he has created an ingredient called "cassavia" that's a paste made from yucca root and is fat-free. It carries flavors and lends texture to foods, similar to the way a butter-based flour roux does, but without the calories. Again, it is about tricking the taste buds, in a healthy fashion. As McLaughlin notes, Romera sees his mission as serving diners meals that allow him to hold to the Hippocratic Oath of doing no harm. He doesn't believe in food that is high in salt and calories, and frowns upon too much wine with dinner – it dulls the taste of the food. Romera likes to tantalize his guests with different kinds of ingredients, such as coffee flowers and snapdragons. While I'll probably never make it to his restaurant, just reading about his cuisine was tantalizing.

I think one reason this article fascinated me is that it was a surprise to learn of a neurologist-chef. It's just not a combination one would be likely to come upon. Both these professions are so demanding, require so much training, and have so little in common that combining them would seem close to impossible. Maybe, but where there's a will – and a passion driving that will – there is a way. I often tell my students that if they have more than one interest or area of expertise, they are more employable, because they can fit in niches where others can't: a police officer with computer skills can handle databases or a math teacher with musical talent can help with the school band. However, having some breadth of interests isn't just economically helpful; it also makes life a lot more interesting. If one of those interests involves biology, then so much the better. As I thought about Romera's complex career, other examples came to mind of those with multiple interests that include the living world.

Gardeners & Statesmen

A couple of months ago, a friend of mine who is a neurophysiologist (in itself a hyphenated expertise) and also a gardener, told me about a book she had just read, *Founding Gardeners* by Andrea Wulf (2011). I had read Wulf's earlier book, *Brother Gardeners* (2009), about the relationships among British gardeners, explorers, and colonial American plantsmen, so I knew she was a good writer. It turns out that her latest book is even better. Maybe I feel that way because it deals more closely with American history, specifically with the first four presidents of the United States. Wulf looks at them from a different perspective, perhaps one that only a British writer could have envisioned: all these men were gardeners.

Wulf begins her book with yet another Founding Father, Benjamin Franklin, and his mission to England in the 1760s and 1770s. During that time, as he fought the Stamp Act and later the tax on tea, he also collected seeds and sent them back to his wife and son on their farm in Pennsylvania. As the years wore on, he could foresee the coming rift between England and its American colonies. He wanted to store up as much of the botanical richness of Britain as he could, including many species that had been sent there from all over the world during the great Age of Exploration. This botanical/agricultural side of Franklin is less well known to many of us than his patriotic side and his work on electricity. But by beginning with Franklin, Wulf makes her agenda clear: to have us think of American heroes in a different way and to argue that their role as gardeners was of a piece with their role as patriots. A major reason that Franklin sent plant material home was because he was planning for the future of his embryonic country. He thought in terms of plants because he was himself very much a farmer and gardener, along with being a printer, writer, scientist, inventor, etc., etc.

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Washington

Wulf then moves on to George Washington, and this was the section of the book that I enjoyed the most. Yes, I knew about Mount Vernon, and that Washington was a farmer. However, the idea that he was obsessed by plants was new to me. Even during the bleakest days of the Revolutionary War, and there were many of them, Washington kept thinking about Mount Vernon, writing instructions to his farm managers, and making plans for the future. When he finally returned to Virginia at the end of 1783, he had been away almost nine years, with only one very short visit home in all that time. Even though it was the dead of winter, he immediately began planning a renovation of his gardens, including a wholesale transplantation of trees to the area around the bowling green that spread out from the front door of his home. He wanted to showcase native species, and combed his woodlands for the right trees. These were not saplings he was having moved, but large trees. This was a major undertaking and he went at it with zest. It was as if this was why he had fought the Revolutionary War, so that he and his fellow Americans could dedicate themselves to the betterment of their land, in the broadest sense of the term.

After Washington had been home for only a few months, he set out on a 700-mile journey by horseback through Pennsylvania to Ohio, wilderness at the time. This gave him a better sense of the breadth of his country, and he returned with a desire to bring some of the plant diversity he had seen and heard about into Mount Vernon. Along with species he had collected from Ohio, he planted white pines from the Northeast and live oaks from the South. Wulf does a good job of capturing the relish with which he wrote and planned and worked to shape the gardens and woods of Mount Vernon. Since, to my knowledge, Washington's relationship to trees hadn't gone beyond the cherry tree, all this was a revelation. It made the Father of Our Country seem much more human: a man with a passion and the energy to fulfill it.

Particularly memorable for me was the story of Washington's role in resolving a long-standing issue between Virginia and Maryland over the navigation rights to the Potomac and to Chesapeake Bay. This dispute had been going on since before the Revolutionary War, but the two colonies had put the quarrel aside while they were fighting a common enemy. Now they needed to settle it for their good and that of their new nation. In 1785, Washington invited the commissioners designated to come up with a solution to Mount Vernon, where they hammered out a compromise. In gratitude for his assistance, both sides, having seen the passion with which he was planting trees on his property, sent him botanical gifts, including a carriage load of cuttings and several hundred fruit trees.

This delight in his garden extended to Washington's farm as well. He was vigilant in using his land and was always trying new crops and new planting methods. This connection to the land makes apparent how difficult it must have been for Washington to tear himself away from Mount Vernon yet again to go to the Continental Congress in 1887, and then to New York to begin two terms as president in 1889. When he returned to Mount Vernon after the war, he was a vigorous man in his early 50s. When he returned in 1897 after his two-term presidency, he had only two more years to live. He still loved his land and his plants, but his years of vigorous work on his property were over.

The good thing about being the Father of a country is that your home is likely to be preserved, so we still have evidence of what Washington achieved. However, few of the trees he planted remain. In an odd book called *Seeds*, Richard Horan (2011) writes about his travels all over the country visiting the homes of famous writers and collecting seeds from the trees at these locales. Ideally, he was looking for trees that were growing there at the time that the writer was in residence. Horan got the idea for this project while visiting Abraham Lincoln's home in Springfield, Illinois. He found a basswood tree that is pictured in a photograph of Lincoln taken in the same spot in 1860. The idea that this tree was a living link to the president excited Horan. When he saw seeds from the tree scattered on the ground, he collected them, and resolved to plant them when he got home. That was the start of a project that extended over several years, involved planting hundreds of seeds, and required a number of road trips around the country. One included a stop at Mount Vernon, where Horan was disappointed to learn that only nine trees survived from Washington's time, including several on the bowling green. Until the year before, there had been three more that had since succumbed to disease, a common story that Horan heard on his travels. Still, those nine are going strong and have to be well over 200 years old.

Adams & Jefferson

Of the four Founding Fathers Wulf deals with, John Adams is the odd man out in several ways. He is the only one not from Virginia and the only one who did not own slaves. Also, he was not as wealthy as the others were and owned a farm with a couple of hundred acres rather than thousands. But like his colleagues, he was fervent about his land and ever trying to improve it. Wulf describes journeys that Adams and Thomas Jefferson took in the spring of 1786 to visit English gardens while they were both envoys for their young nation. Adams, ambassador to England, was attempting to negotiate a trade treaty with the British. Jefferson, who was ambassador to France, came to England to assist Adams. After they worked out a new draft and sent it off, they had time on their hands and decided that a tour of some of the great garden estates would be a useful way to occupy themselves.

Jefferson in particular wanted to pick up ideas for his own estate at Monticello, but Adams, too, had an ardent interest in plants. What they discovered was that many of the plants favored by English gardeners were North American species. Ironically, the opposite phenomenon was occurring across the ocean, where British plants were crowding out native species, as colonists attempted to recreate European gardens. This is definitely an example of the grass being greener on the other side of the fence. There was a lively plant trade between England and America. People such as the wealthy merchant Peter Collinson had been importing seeds and cuttings from the colonies for decades, especially through the services of John Bartram, a Philadelphia farmer and nurseryman. He and his son, William, had also supplied plants to all four of the founding gardeners – and to Franklin as well.

William Bartram figures in one of Wulf's central stories in the book. She describes an event that occurred during the hot Philadelphia summer when delegates to the Constitutional Convention were attempting to hammer out a compromise between states with large populations and those with small ones. If you remember your history, the larger states wanted representation to be by population size, and the smaller states thought that each state should have the same number of representatives. They were at an impasse when a group of delegates, including some from each side of the controversy, went off by carriage to spend a morning at Bartram's farm. In their eagerness to escape the city's heat, they arrived so early that William Bartram was in the middle of his morning chores. He dropped everything to guide his guests around for a three-hour tour, with many plant and seed purchases made by the end of it. Within a few days after the farm visit, the Great Compromise was reached in which

representation was by population in the lower house and set at two each in the upper house. Wulf can't prove that the Bartram tour was responsible for breaking the deadlock, but by reminding representatives of both sides that they had much in common when it came to the land, the trip may have softened viewpoints just enough to ease the way to agreement.

Madison

Among those on the jaunt was James Madison, who at 35 years of age was one of the younger delegates, and not yet married to Dolley. He would inherit the Virginia estate called Montpelier, after the great French garden. I must admit that of the four founders Wulf investigates, Madison is the least known to me. By the time he became the fourth President in 1809, the country was going beyond its infancy, and excitement about its birth was waning. To me, Madison is the first in a long list of presidents leading up to the next great figure, Lincoln, so I hadn't paid much attention to Madison. Wulf helped me to value him more highly. She sees him as a passionate gardener, and also as one of the founders of environmentalism. In 1817, the year he left office, Madison gave a speech in which he warned about the destruction of fertile soil and the need to investigate rotation of crops and other methods to ensure that the land would remain rich for future generations. He also expressed alarm about the exploitation of forests; here was another great resource of the nation that was being thoughtlessly wasted.

But Madison went further by citing the latest science of the day, including Humphrey Davy on agricultural chemistry, Joseph Priestley on oxygen, and even Jan Ingenhousz on plant respiration. Here was a politician with a deep knowledge not only of the nation's resources, but of how science could aid in husbanding those resources. This side of Madison was new to me, and fascinating. It is yet another reminder of how well read and eager for ideas the men who shaped our country were. Wulf taught me that the threats to our environment have a long history and so have the attempts to deal with those threats. There are times when I get overwhelmed by all the new biology there is to learn, and I forget the importance of history to keeping the new in perspective. Reading about the founding gardeners made me realize that I have to make history my "other job" not only to deepen my understanding of biology's roots, but also to help me, and my students, develop as better citizens.

A Pirate/Naturalist

Another book recommended to me was one I would never have picked up on my own, *A Pirate of Exquisite Mind* (Preston & Preston, 2004). Pirates are really not my thing. But Robbin Moran, a plant scientist with an interest in the history of science, suggested the biography of William Dampier (1652–1715) because Dampier was one of the earliest Europeans to write about the natural history of Australia and also explored other areas of the world during a 12-year circumnavigation. Among the other things I learned from this book is the difference between a privateer and a buccaneer. A pirate is essentially someone who steals on the high seas. A privateer did it somewhat legally, having an official government letter allowing theft from enemy ships. Buccaneers, on the other hand, were more outright pirates, with no official sanction. Dampier belonged to this second group and usually served under a captain who directed operations. His journey around the world involved moving from one ship to another as circumstances dictated, sometimes with extended stopovers in such places as Jamaica, the Galápagos Islands, Southeast Asia, etc., etc.

Dampier relished this life, and he also relished writing about it. He kept journals and went to the trouble of hauling these tomes around and protecting them from the elements, though they did suffer some water damage along the way. He was interested in everything: the ocean currents and weather phenomena, the indigenous peoples he encountered and their customs, the strange plants and animals he saw and sometimes sketched. When he finally returned from this 12-year adventure, he wrote books on various aspects of his journey, including one on trade winds, tides, and currents and another on the products and trading practices he had observed. Here was a man of many talents, and someone willing to investigate almost anything he came upon.

Dampier married a few months before his 12-year voyage (1689–1691), but even when he finally returned to England and to his wife, Judith, he couldn't settle down indefinitely. In January 1699, he set out again as captain of a British naval vessel, the *Roebuck*. On this voyage, he explored part of the west coast of what was then called New Holland and is now Australia. He didn't manage to get around to the more agreeable areas of the east coast, but again, he wrote about his observations when he returned to England. The two volumes he completed included illustrations of such creatures as the monkfish and the cuttlefish. He also returned with pressed plants that eventually became part of the Hans Sloane collection, which is now in the Natural History Museum, London.

Dampier preceded Captain Cook to Australia by almost 100 years and Charles Darwin to the Galápagos by almost 150 years. His books became important to the explorers who came after him. When Darwin made up a reading list on the species question, he included only four books written before 1700, and Dampier's was one of them. Darwin saw Dampier as a naturalist and valued the buccaneer's descriptions of species and his ability to differentiate between what would later come to be known as subspecies. So it seems to be unfair to Dampier to characterize him simply as a pirate, just as it isn't right to call Romera merely a chef. Such pigeonholing gives too limited a view of a multifaceted person. It satisfies the human urge to simplify things and keep them neat, though it leads to a skewed view of people and of the world.

Having a Second Job

I have to admit that I enjoyed reading about the people I've discussed here because in each case, I was surprised by what I discovered. This is a result of my own tendency to categorize people as doctors, or chefs, or pirates. Hyphenated lives are just too difficult to deal with, even though they are so much more fascinating. These lives could be more interesting to our students as well. A biologist/pirate could wake up the back row, as could a lesson on trees from the viewpoint of George Washington (what is *he* doing in bio class?); the diet-conscious would take to a chef who can trick the hypothalamus – colored water that can make you feel full, wow.

Needless to say, ferreting out examples of people who take biology *and* something else seriously isn't easy. It requires us to be fairly hyphenated as well; at the very least, we have to be biologist/readers. But this wakes us up, too. I loved discovering that Salvador Luria (1984), who won the Nobel Prize for his pioneering work in molecular biology, studied sculpture and became quite good at it. However, he eventually gave it up because he found himself becoming too worried about being good at it; it was no longer fun to have a dual career. The x-ray crystallographer Helen Megaw was also interested in design and fashion. This led her to spearheading an early-1950s project for the Festival of Britain, which showcased

British goods as the country tried to reconstruct itself after World War II. Megaw enlisted the aid of such notable scientists, and future Nobel Prize winners, as John Kendrew and Dorothy Hodgkin. The latter's x-ray diffraction image of the structure of insulin was converted into a repeat pattern for wallpaper. Kendrew's image of the muscle protein myoglobin ended up on upholstery. Lesley Jackson (2008) has written a wonderful book on the whole project. It's full of illustrations of interest to those of you who may be biologist/interior decorators. In any case, keep your eyes open for such extensions of biology into other areas – they are myriad and surprising. It turns out that an awful lot of biologists have second jobs.

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