

Teaching Literature and Science in Silicon Valley

Abigail Droge

Literature and science teaching has the potential to address an urgent need for collaboration across ever splintering and specializing literacies, and even a single classroom can act as a ground zero for large-scale cooperation between the humanities and the sciences. I begin the process of understanding what is at stake in literature and science teaching by describing my own experiences at Stanford University in Silicon Valley, California.¹ The opportunities and challenges that interdisciplinary teaching faces here, and the relationship that such teaching has to a surrounding corporate environment heavily based in science and technology, can suggest ways forward for the civic potential of literature and science more broadly.

In the Spring of 2016, I taught George Eliot, Charles Darwin, Robert Louis Stevenson, and H. G. Wells to a small group of Stanford undergraduates with backgrounds in English, Biology, and Computer Science.² On the first day, I asked the class to define "literature" and "science" from their twenty-first-century perspectives, and we made a word-cloud of their associations on the board. "Emotional," "ambiguous," "narrative," "enjoyable," "aesthetic," "qualitative," and "social" clustered under literature, while "empirical," "analysis," "examining," "testing," "logical," "hip/current," "observation," "quantitative," and "solutions-oriented" adhered to science. This exercise has peculiar traction at Stanford, where science majors are known as "techies" and humanities majors are dubbed "fuzzies" (not participating in the *hard* sciences). My students tell me that the labels are taken with varying degrees of seriousness, but the terms still reveal ingrained assumptions about the disciplines here. Stanford sits in the shadow of major tech companies like Google, Facebook, and Apple, and the university is in many ways co-constitutive with its surrounding industry. But the San Francisco Bay Area also celebrates a vibrant literary heritage that includes John Steinbeck and Jack London, as well as arts movements like the Beats and 1960s counterculture. Both worlds exist in overlaid palimpsests—a shiny Apple store sits within a few blocks of an historic artists' guild—yet it can sometimes be easy for one to eclipse the other, particularly when students must make difficult financial decisions about whether to prioritize humanistic inquiry or new types of scientific and technological literacy. Tellingly, "jobs" and "stable opportunities" landed on the science side of the list, though we did add the nebulous phrase "different kind of ambition" to the literature side.

Over the next ten weeks, we pulled apart and examined these first-day assumptions, deconstructing our monolithic terms into more nuanced meanings. The nineteenth-century texts on our syllabus gave us new ways of thinking about the role of imagination in science and the role of fact in fiction. The center-piece of the course was an in-depth tandem reading of *The Mill on the Floss* and *On the Origin of Species*, which were published within a few months of each other. Recovering the fluidity of the disciplines in the historical moment of 1859-60 gave my students the freedom to think about their own roles as interdisciplinary scholars within the rigid system of

specialization that has sprung up between Eliot and Darwin's time and our own. Students were especially surprised by Darwin's readability and lack of jargon. By the end of the course, my computer science major wanted to be a public academic, writing for a broad audience and advocating the role of imagination in science education. On the last day, when I asked students if they would revise their initial definitions of "literature" and "science" based on our Victorian readings, several said that they would rethink the prominence of terms like "logic" and "empiricism" in connection with science, to make room for "imagination" and "creativity."

In a lesson near the end of the term, we placed our coursework directly in conversation with Silicon Valley culture. After a discussion about whether Silicon Valley's attitude towards technology is utopic or dystopic (many students saw dystopia, despite a culture of constant positive advertising for technological solutions) I gave the class the following prompt: "Imagine you are the president of Stanford. Identify a current local problem and design a new interdisciplinary educational initiative to address it, or at least to understand it better as a first step towards action. Your board of directors consists of the scientific and literary authors we have read during the term: Eliot, Darwin, Wells, and Stevenson. What advice do you think you would receive from each author and would you take it?" Propositions from my students included a plan to establish an artist-in-residence at the university marine research center, a syllabus for a videogame design course, in which creative writers and programmers would work together to tell a story, a Darwin Center for Science Education, in which students from many disciplines could reflect on the ethical implications of scientific research, and a George Eliot Program for Science in Humanistic Inquiry, oriented around harnessing scientific innovation to further humanities projects.

This activity made clear the value of literature and science teaching beyond our classroom by prompting my students to adopt both literary and scientific habits of mind to address a problem. But, importantly, it did not assume that the past provides an appropriate or inappropriate rubric for assessing the present. The class had to choose whether advice from past generations was relevant, or whether it must be changed in order to accord with different circumstances. This lesson also allowed students to engage in a metacognitive reflection about the specialized structures that govern their own educations. What may have started as a course on Victorian evolutionary thought had ended as a meditation on the ongoing interactions between the disciplines in Silicon Valley. It is telling that many of the ideas generated by the class focused on redesigning educational forms—a center, a syllabus—in order to provide new pathways for interdisciplinary connection.

Stanford already does offer students numerous ways to be interdisciplinary. Many arts and science initiatives are single course offerings, like mine, and come from both humanities and science departments. The Stanford Biology Department, for example, emphasizes the relevance of literature and the arts for both incoming and advanced students. "Views of a Changing Sea: Literature and Science" prompts first year undergraduates to address issues of climate change by reading fiction alongside non-fiction, and Biology and other life science students can opt-in to a year-long Senior Reflection, "an exciting, in-depth creative project that joins a compelling scientific subject with a passion for the arts" ("Art"). The Stanford Medical School hosts reading groups for physicians, and a course called "Medical Improvisation" uses theater

techniques to improve bedside manner, claiming that "[m]edicine, like theater, is both a skill set and an art form" ("Art"). Materials Science students in "Thermodynamics and Phase Equilibria" can unpack difficult concepts and engage with the history of the discipline by reading a graphic novel, specially written for the class by an interdisciplinary team of researchers and artists ("Thermodynamics"). Cross-listed and team-taught courses offer yet another avenue. "Water Resources: Culture and Context," cross-listed in the American Studies and Environment and Resources Departments, is led by a "multidisciplinary team of instructors" who take turns leading the seminar and engaging with different resources, like an exhibit in the university art center, and "local feats of water infrastructure" ("Art"). And "Literature and Human Experimentation," cross-listed in five departments, including Comparative Literature, Human Biology, and African American Studies, grapples with "modes of ethics deliberation that are possible via creative uses of the imagination, and literature's place in a history of ethical thinking about humane research and care" ("Art").

The single course has many advantages. Already overtaxed students who do not have much spare room in their schedules for courses that will not directly contribute to their program of study can at least be exposed to materials which they might not otherwise encounter. Including content from another discipline is a powerful way for a professor to establish mutual relevance and introduce change within existing rigid systems of course requirements. But there are challenges, too. Interdisciplinary classes often find themselves ironically curtailed within the confines of a single academic discipline, since it can be difficult to reach and entice students beyond the instructor's home department. If the course is limited to a single term, it can be hard to encourage lasting impact, particularly through applications like community engagement or systemic institutional change that could build robust collaborative connections between isolated departments. And finally, arts and science courses are often only feasible in already privileged and well-funded institutions. If a college is struggling to provide survey courses of all major literary periods, for example, it will be less likely to have the luxury of a specialized seminar on literature and science. Thus, the important work of interdisciplinarity runs the risk of being segmented, brief, and unevenly distributed.

Literature and science teaching often goes beyond the single course at Stanford to inform entire interdisciplinary centers and programs. The Literary Lab and the Center for Spatial and Textual Analysis (CESTA) are both strongly collaborative examples of the digital humanities that bring together scholars and students from many disciplines. The Medicine & the Muse Program run by the Stanford Center for Biomedical Ethics "integrate[s] the arts and humanities into medical education, scholarly endeavors, and the practice of medicine" ("Medicine"). The Cantor Arts Center on campus hosts an "Art+Science Learning Lab," oriented around the interdisciplinary work of conservation ("Art"). And the Emmett Interdisciplinary Program in Environment and Resources (E-IPER) combines perspectives from across the disciplines, including the humanities, earth sciences, and engineering, to address pressing environmental problems ("Emmett"). The benefits of these types of programs are multiple: they allow for specialization while still valuing collaboration; they bring people from different fields into immediate personal contact; and they have the potential to accomplish more systemic change, by virtue of having larger infrastructural resources. They can train students in many types of thinking, from analytic to empathetic, and they recognize that a variety of skills and viewpoints are

required to solve large problems. One potential downside to such a model, however, is that the students who engage in interdisciplinary programs tend to be self-selecting. Interdisciplinarity becomes an elected add-on, not the norm of academic experience.

To close, I want to consider the context of the Silicon Valley tech industry, which offers a stimulating and often bizarre lens through which to meditate on the broader implications of literature and science teaching.³ The corporate culture of the Valley is saturated with intersections between literary and scientific methods, though they are often not overtly labeled as such. Buzzwords include terms we might recognize as literary—"narrative," "storytelling," "empathy," and "creativity"—but these terms are often dissociated from the content or context of the humanities to become free-floating business strategies for developing tech products. A primary site for interdisciplinary interplay is "design thinking," a mantra associated with the Stanford d.school (shorthand for the Hasso Plattner Institute of Design at Stanford) and many Silicon Valley companies. Design includes a strong narrative drive as part of an iterative process of prototyping products and imagining the experiences of potential users. As a d.school class known as "StoryViz" puts it, design students in the course will have both "an opportunity to explore those elements that make stories great" and "a chance to riff on an emergent trend: stories being as powerful as the products they describe" ("StoryViz"). The method of "design fiction," often used by "futurists," makes the literary connection more explicit by borrowing strategies from creative writing (often science fiction) to imagine what-if scenarios (sometimes with a dystopic tinge). Fictional vignettes can be oriented around everything from potential products, as in the "TBD Catalog" from the Near Future Laboratory in San Francisco, to global problems like the sustainability of foodways, as in the work of nonprofit research organization The Institute for the Future (IFTF).

This is the world that our students will join when they leave our literature and science classes. And, notably, more and more literature students are joining the ranks of the techies to find jobs in Silicon Valley. Some voices are even calling explicitly for tech companies to invest in humanists. According to Christian Madsbjerg, successful businessman and author of *Sensemaking: The Power of the Humanities in the Age of the Algorithm*, reading novels provides the empathetic skills necessary to nurture an unabashedly lucrative entrepreneurship:

We shouldn't ask people to forgo books and great art in order to code. In an increasingly technologically-driven society, we should do the opposite: cherish it, respect the human abilities it fosters, and applaud our kids for wanting to spend time with great stories. You don't need to do it because it's nice, but because it's smart business. (Madsbjerg)

Such rhetoric does the positive work of fostering the connection between literature and technology and pluralizing the methods used to address complex problems, not to mention offering well-paying jobs to humanities graduates. But there are a number of cautions that we must be aware of in order to make sure these collaborations remain responsible and productive. The largest challenge is what we might call handmaiden syndrome. It is easy for a better-resourced discipline (in Silicon Valley, this often means science or engineering), to employ a less-resourced discipline (frequently from the arts,

humanities, and social sciences) as an interdisciplinary gesture, which is in fact a masquerade (either overtly or covertly) for a financial or entrepreneurial goal. The lesser discipline is expected to become a tool, not an equal partner. This happens most frequently when skills from the humanities, like "empathy" and "creativity," are divorced from the content of the humanities: a company might want to employ an English PhD student because of her problem-solving skills and her writing ability, but not expect or desire that employee to inflect into her work any kind of ethical or historical understanding of the traditional pitfalls of over-confidence in technology, or a critique of the entrepreneurial mindset.⁴ Make it new and make it now are the mantras of Silicon Valley. Types of knowledge that would come from understanding literary content, like historical awareness, an appreciation of multiplicity and contradiction, a nuanced emotional and empathetic capacity, or even a slower and more deliberative working style, become subsumed in a push toward present profits and present innovation.

In a Silicon Valley environment in which literature students often go on to careers as tech writers, program managers, or start-up founders, we must ensure that they, and their science colleagues, leave college prepared to navigate a complicated interdisciplinary terrain. It is not enough to be able to adopt tools, skills, and modes of thought from the sciences and the humanities, though that is crucial. Students must also gain a meta-cognition about the institutions and industries in which they find themselves. They must understand why and how certain values have adhered to science or to literature and what they can do to harness both the skills and the content of those fields in order to interrogate the structures that govern them. What is required for this kind of endeavor is intra- and inter-institutional collaboration on a new scale, but the energy must start with us. Literature and science teaching must become the norm, not the exception. This article is therefore a small step in what must be a larger process: celebrating, interrogating, and strategizing our potential as teachers (and researchers) of literature and science.

Notes

1. My perspective at Stanford is by no means representative of the experiences of diverse populations across the San Francisco Bay Area. ("Silicon Valley," itself, is a notoriously nebulous term.) I can only offer a starting point into an infinitely more complex question.

2. The course was titled "Novels vs Dinosaurs: Narratives of Evolution in Nineteenth-Century British Literature and Science" and was part of the Writing Intensive Seminars in English (WISE) program in the Stanford English Department. I am immensely grateful for the dedication and thoughtfulness of my students.

3. In my discussion of the tech industry, which spans everything from Facebook to medical and biotech companies, I am considering engineering and programming as part of "science," broadly defined.

4. The problem of stripping methods of their disciplinary contexts is not unique to the experience of humanists in Silicon Valley. This phenomenon has also been commented on extensively by anthropologists, many of whom work in the tech industry and are uncomfortable with the way that the ethnographic methods central to their discipline are being rebranded as user experience, or "UX," research. See, for example, Shaheen Amirebrahimi's 2016 article, "The Rise of the User and the Fall of People: Ethnographic Cooptation and a New Language of Globalization."

Works Cited

- Amirebrahimi, Shaheen. "The Rise of the User and the Fall of People: Ethnographic Cooptation and a New Language of Globalization." *Ethnographic Praxis in Industry Conference Proceedings*, 2016, pp. 71-103.
- "Art + Science." *Stanford Arts*, arts.stanford.edu/for-faculty/art-science/. Accessed 29 Mar. 2017.
- "CESTA – A Premier Research Center in the Digital Humanities." *Center for Spatial and Textual Analysis*, Stanford University, cesta.stanford.edu/. Accessed 29 Mar. 2017.
- Darwin, Charles. *On the Origin of Species*. Ed. Joseph Carroll. Peterborough, Ontario: Broadview Press, 2003.
- Droge, Abigail. "Novels vs. Dinosaurs: Narratives of Evolution in Nineteenth-Century British Literature and Science." *Writing Intensive Seminars in English*, Stanford English Department, english.stanford.edu/courses/2015-2016-english-162w. Accessed 29 Mar. 2017.
- Eliot, George. *The Mill on the Floss*. Ed. A. S. Byatt. London: Penguin, 2003.
- "Emmett Interdisciplinary Program in Environment and Resources." *Stanford School of Earth, Energy & Environmental Sciences*, earth.stanford.edu/eiper/about. Accessed 29 Mar. 2017.
- "Explore the Stanford d.school." Hasso Plattner Institute for Design, Stanford University, 2017, dschool.stanford.edu. Accessed 29 Mar. 2017.
- Madsbjerg, Christian. "Silicon Valley Needs to Get Schooled." *LinkedIn*, 18 Mar. 2017, linkedin.com/pulse/silicon-valley-needs-get-schooled-christian-madsbjerg.
- "Medicine & the Muse Program." *Stanford Center for Biomedical Ethics*, Stanford Medicine, 2017, med.stanford.edu/medicineandthemuse.html. Accessed 29 Mar. 2017.
- "Stanford Literary Lab." litlab.stanford.edu/. Accessed 29 Mar. 2017.
- Stevenson, Robert Louis. *Strange Case of Dr Jekyll and Mr Hyde, and Other Tales*. Ed. Roger Luckhurst. Oxford: Oxford UP, 2008.
- "StoryViz beta: the Stanford d.school's storytelling & visual communication studio." StoryViz, 2012, storyviz.com/content/get-started/. Accessed 29 March 2017.
- "TBD Catalog." Near Future Laboratory Shop, 2017, shop.nearfuturelaboratory.com/. Accessed 29 Mar. 2017.
- "Thermodynamics and Phase Equilibria." *Stanford Vice Provost for Teaching and Learning*, vptl.stanford.edu/spotlight/thermodynamics-and-phase-equilibria. Accessed 29 Mar. 2017.
- Wells, H. G. *The Time Machine*. Ed. Patrick Parrinder. London: Penguin, 2005.
- "What We Do." *Institute for the Future*, 2016, www.iftf.org/what-we-do/. Accessed 29 Mar., 2017.