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# "Introduction" (Chapter 1) of Stories About Science in Law: Literary and Historical Images of Acquired Expertise (Ashgate 2011)

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# "Introduction" (Chapter 1, pp. 1-9) from

# *STORIES ABOUT SCIENCE IN LAW: LITERARY AND HISTORICAL IMAGES OF ACQUIRED EXPERTISE*

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Near the end of 2010, at the mid-point of the (first?) Obama Administration, a *Wall Street Journal* editorial opinion entitled "Ag Department Uproots Science" warned of a "jaw-dropping" move on the part of U.S. Agriculture Secretary Tom Vilsack:

> [He] has invited activists and biotech critics to shape the agency's regulatory decision on a biotech product. If the precedent stands, it could permanently politicize a system that is supposed to be based on science (*Wall Street Journal*, 27 Dec. 2010, A16).

Even though "Roundup Ready," an alfalfa variety produced by Monsanto to withstand a popular herbicide, recently endured an environmental impact review that judged the product as "substantially equivalent to other varieties without red flags for regulators," Vilsack suggested "that science itself is subjective, and that he could have three different groups bring him three different supposedly scientific opinions" on the risks of Roundup Ready (*Wall Street Journal* 2010). Such "antics," granting governmental imprimatur to "vintage antibiotech activist fare" of a type seen "in trade disputes with the European Union," compelled the editorialist to conclude:

> If nonscience criteria are introduced as considerations for allowing the sale of biotech crops, the effect would be disastrous for the [U.S. Dept. of Agriculture's] regulatory reputation. We hope Secretary Vilsack makes his decision based on science, not politics (*Wall Street Journal* 2010).

Plain and simple, black and white, science versus politics.

The editorial is a microcosm of sorts for the world of law/science relations. Its author unwittingly revived the decades-old "science wars," which over-simplistically divided those who believe in the esoteric and decisive authority of objective science, from those who saw science as a cultural activity betraying social, institutional, rhetorical, and even political aspects in the construction of its authority. The former resisted what they saw as an attack on science (Collins and Evans, "The Third Wave of Science Studies…," *Soc. Stud. Sci.* 32(2):276 (2002)), while the latter resisted caricature as complete relativists with no appreciation for scientific progress. In academic terms, the former view was associated with a positivistic or idealized view of science as rising above politics and culture, while the latter view, associated with "science studies" or the sociology of scientific knowledge, variously emphasized

> that it is necessary to draw on "extra-scientific factors' to bring about the closure of scientific and technical debates – scientific method, experiments, observation, and theories are not enough (Collins and Evans 2002:239).

Finally, while adherents of the former view might have seen the need for elite scientists alone to make political and legal decisions on matters involving science and technology, the latter view's adherents "[a]lmost invariably … call[ed] for greater dialogue between science and the public, and for increased participation in decision-making about science and technology" (Collins and Evans 2002:272).

These positions can easily be identified in the brief *Wall Street Journal* editorial – in the implied criticism of Vilsack's suggestion that science is subjective, in the reference to the

European Union (where greater dialogue between science and the public has been normalized), and in the clean divisions between science and politics, between scientific data and non-science criteria, and between seemingly rational actors and "activists." The notion that there might be three credible but contradictory scientific opinions on any regulatory matter is dismissed as virtually impossible – hence the adjective "supposedly" when discussing different scientific opinions. The editorial therefore represents a particular view of expertise in law/science relations, namely one that eclipses genuine scientific controversy. That is, the environmental impact review (conducted by the Department of Agriculture's Animal and Plant Health Inspection Service branch) is assumed to be "science," while critics are marginalized as pseudo-scientific activists, and Vilsack's acknowledged doubt is dismissed as politically-driven.

Of course, the fact that the editorial appeared in the *Wall Street Journal* could lead one to discredit the argument as pro-agri-business, and its status as an editorial opinion rather than a news report reduces its significance. For my purposes, however, the editorial highlights the significance of one's images of science and scientific expertise and their role in legal contexts, whether in administrative decision-making involving science and technology or in the courtroom when a lawsuit involves scientific issues. Clearly, law relies on science, but how do we picture that relationship? One resource for exploring our understanding of science and its place in law is popular culture, including the literary representatives of law and science in novels, plays, and movies, as well as in historical narratives. My question in this book, without exhaustively surveying the field but by offering some examples, is what do we learn about the place of science in law when we consider the popular culture images of that relationship? A preliminary question for the reader, however, may be why those sources – stories about science in law – are promising for the study of law/science relations. My answer is that popular culture images of law, on the

one hand, and popular culture images of science, on the other, have proved to be fruitful for understanding law, and science, respectively.

For example, the law-and-literature movement is based in part upon the notion, controversial in some critics' eyes, that literary representations of law and lawyers can offer insights into contemporary legal processes and institutions. While a fictionalized account of a legal proceeding may in some respects be inferior to an historical or scholarly legal account, fiction about law and lawyers can nevertheless function to raise ethical issues, demonstrate how established law might reflect social bias, or provide models for reform. Indeed, Richard Weisberg refers to literature as a "source of law," providing "unique insights into law's underpinnings" that can be "richer and certainly more accessible" than philosophy of law texts (Weisberg, *Poethics*, 1992:3). The notion that literature is a *source* of law sounds controversial – law is usually found in statutes, judicial opinions, reputable commentaries – but Weisberg means to make a strong point that literature about lawyers is not dispensable. From another vantage, Cynthia Bond argues that cinema participates in the constitution of race and racial classifications, such that audiences viewing a law film actually *construct* legally significant categories as part of their spectatorship (Bond, "Laws of Race/Laws of Representation…," *Tex. Rev. Ent. & Sports* 11:219-65 (2010)). While that too may sound counter-intuitive, the capacity of visual media to construct culture, and the way that law reflects culture in its operation and interpretation, grants to popular culture an oft-hidden power to create social realities. Thus William MacNeil coins the term *lex populi* (people's law or pop law) in turning to literary, televisual, and cinematic sources for jurisprudential insights (MacNeil, *Lex Populi*, 2007:1). Such sources "not only reach a much larger audience than standard legal texts, but potentially … help restore topics of jurisprudential import – justice, rights, ethics – to where they belong: …

with the community at large" (MacNeil 2007:1-2). Historical accuracy, which some might see as the primary value of literary representations of law and legal processes, is somewhat beside the point in light of the capacity of fictional images of law to direct sympathies, encourage moral judgments, or create hero-figures, which effects can in turn influence how law students, lawyers, and judges respectively learn, practice, and apply the law.

Similarly, literature-and-science studies are based in part on the notion, likewise controversial, that popular culture images of science and scientists have the power to change public perceptions of the scientific enterprise, influence government policy, inspire (or discourage) future scientists, affect research support and funding, and even create public consensus concerning a particular scientific theory. For example, there is a literary tradition of negative portrayals of science and scientists, documented by Haynes (*From Faust to Strangelove*, 1994) and suggesting that science is dangerous, or that scientists are amoral; likewise, Tudor (*Monsters and Mad Scientists*, 1989) documented the persistent image of the mad scientist in the history of horror movies. Both traditions can be linked to cultural awareness of the risks of science and the need for ethical or other regulatory controls. But there is also a contemporary backlash among scientists interested in (or writing) science fiction. Jennifer Rohn, the author of two laboratory novels (and editor of the website LabLit.com) coined the term "Lab Lit" in 2001 "to describe realistic novels that contain scientists as central characters plying their trade" (Rohn, "More Lab in the Library," *Nature* 465:265 (2010)). Like those who distinguish *hard* science fiction (or [plausible] science *in* fiction) from science *fantasy*, Rohn distinguishes "Lab Lit" from "science fiction, in which the action takes place in speculative worlds and may not involve scientist characters" (Rohn 2010).

Rohn describes the stereotypes in science fiction – "arrogance, asexuality, semi-autism, out-of-control experiments and concomitant downfall" – as clichéd, and seems to prefer positive portrayals (albeit in a "culture [that] is a complex web of urgent human passions and behaviors") to help science's image and to reduce public distrust of science (Rohn 2006). There is, nevertheless, a critical edge in Lab Lit; Rohn says of biotech that "what constitutes truth is just as ephemeral here as in the academic world, no matter how shiny its packaging" (2010b). Allegra Goodman's *Intuition* (2006), an unflattering example of Lab Lit, involves scientific fraud – "one of the guilty secrets of the scientific world," the prevalence of which "policymakers seriously underestimate" (Cookson, "The Real Lab Rats," *Fin. Times*, 23 May 2009).

> *Intuition* … is a brilliant fictional account of what might drive a scientist to manipulate data – and [it] captures the sheer uncertainty and ambiguity over research misconduct …. Fraud proves itself an excellent theme for bringing out the human side of science[:] … every "proof" and every "truth" is brought to us by humans, who are far from infallible (Cookson 2009).

Scientists, in Goodman's novel, rely on luck, "charm money from NIH," crave recognition, and suppress data in a feudal institution of jealousy and politics (Goodman 2006:18, 31, 127, 182, 211, 230). Thus the pursuit of realism in Lab Lit, albeit escaping the negative portrayals of *Frankenstein*-genre clichés, actually enhances the critical potential for offering the public a modest, rather than idealized, view of science. While one might not be able, in hard science fiction studies, to replicate Weisberg's form of argument – literature is not a *source* of scientific knowledge – it is arguably a source of knowledge *about* science, and certainly a source of popular culture images of science.

My own effort is aimed at combining (1) law-and-literature studies (wherein literature offers insights into legal processes and institutions) with (2) literature-and-science studies (wherein literature offers insights into scientific practice and progress) to enrich the discourse of

(3) law/science relations (which is itself a field of study that focuses on contemporary rules of evidence and regulatory frameworks, and seldom relies on literary or historical sources). In such an enterprise, we do learn something about law, especially the ways in which law relies on science and sometimes idealizes the capacity of science to settle legal disputes; we also learn something about science, especially the ways in which science is like law – institutional, rhetorical, cultural, and even political. But my primary goal is to focus on stories that explore the relationship between law and science, and especially the cultural images of science that prevail in legal contexts.

The particular approach in this book contrasts with but parallels other methods of exploring the ways that expertise is transferred to or constructed within legal contexts. Sociologists of scientific knowledge might proceed by conducting ethnographic studies – visiting laboratories, interviewing scientists – to understand how credibility and expertise are established, and then observe what happens to science in law – how experts function in regulatory or litigation contexts, and how controversies are settled. Likewise,

> [p]olitical scientists study expertise [and its role in public decision making], and more often than not they have important things to say .... Economists of various persuasion, but in particular the new economics of science ..., are [also] rediscovering the phenomena analyzed by sociology of scientific knowledge .... (Rip, "Constructing Expertise," *Soc. Stud. Sci*. 33:3:421, 428 (2003)).

And of course, historians and philosophers of science attend to questions concerning the origins and development of, as well as criteria for judging, scientific expertise.

By contrast, the subject of inquiry for this book, literary and historical images of scientific expertise in law, lies at the intersection of the three aforementioned interdisciplinary projects: law and science, law and literature, and literature and science. The first two projects are primarily associated with legal scholarship – i.e., "law" is typically "the privileged element"

or object of interdisciplinary inquiry in the two dyads (law and science, law and literature), insofar as the inquiry is typically concerned with what literature (both its texts that represent law and lawyers and its critical methodologies) or scientific knowledge can tell us about or *do* for law (Pether, "Language," in *Law and the Humanities* (eds. Sarat et al.) 2009:318 n.7). The third project (literature and science), conversely, is not typically viewed as a field of science, but is rather associated with literature (both its texts that represent science or scientists, and its critical methodologies, including language and rhetoric studies) or science studies, including historical, philosophical, or sociological studies of science. My own focus on literary and historical images of expertise (appropriated into legal contexts) simultaneously harnesses elements from all three projects to create a hybrid enterprise of sorts.

The law and science project is not so much a unified field of inquiry as it is a general recognition that the understanding of science and technology is crucial for numerous areas of law, including not only scientific expertise to offer insights in the courtroom and in regulatory contexts, but also patent law, bio-ethics, and regulation of science and technology (including pollution abatement, genetically-modified food safety, pre-market drug testing, and restrictions on synthetic biology, to name but a few). The relationship of law and science is therefore the subject of conferences, journals, associations (e.g., the ABA section on science and technology), and law school courses. Nevertheless, the "project" of law and science can be variously defined, and because its perceived elements are part of numerous other sub-disciplines (evidence law, administrative law, environmental law, health law, cyber-law), its boundaries are vague. In any event, since this book is about scientific expertise in law, albeit focused on literary and historical images, my inquiry can be located within the "law and science" project.

As to the law and literature, and literature and science, projects, and the potential for a hybrid law, literature, and science project, they are the subject of Chapter 2. Acknowledging the difficulty of identifying law-lit and lit-sci as "movements" or clearly bounded sub-disciplines, I explore the twin inquires in law *and* literature studies (i.e., law *in* literature, and law *as* literature) and the twin inquires in literature *and* science studies (i.e., science *in* literature, and science *as* literature). I characterize my approach as a hybrid because, for example, a fictional text about a scientist testifying in court is not only a literary representation of law (law *in* literature), as well as literary representation of a scientist (science *in* literature), but the testimony of the scientist is both a legally significant text (law *as* literature) and a scientific text (science *as* literature) that can be analyzed using literary critical or rhetorical tools.

The chapters that follow provide examples of my hybrid approach in various literary and historical contexts. Chapter 3 considers several exemplary "literature and science" short stories (by Ramón y Cajal) that not only reveal the ethical, rhetorical, and reputational (or public relations) aspects of the scientific enterprise, but frequently contrast law and lawyers with science and scientists. My goal is to compare Cajal's literary descriptions of science and scientists with an idealized view that often dominates legal discourse. Chapter 4, focusing on Arthur Miller's adaptation of Ibsen's *An Enemy of the People*, explores the recent interest in the public understanding of science and the argument that the public should play a role in scientific controversies. I then identify judges as belonging to the public (i.e., not on the "side" of science) with respect to courtroom experts and admissibility determinations, and distinguish between two judicial images of science. In Chapter 5, I turn to trial movies involving experts, and identify there the same two views of science – an idealized view and a modest or pragmatic view – that correspond to the two views of science in the post-*Daubert* U.S. courtroom. Judicial and public

idealizations of science, I argue, have adverse consequences in law. Chapter 6 re-visits Capote's *In Cold Blood* to reflect on the ethical obligations of lawyers with respect to expert evidence. Notwithstanding Capote's claim that his "true" novel has no authorial message, I show that Capote implicitly condemns legal processes as potentially detrimental to both scientific progress and the goal of justice in law. Finally, in Chapter 7, I consider the ethical obligations of scientific experts, with reference to an early 19th-century episode of alleged arsenic poisoning. The medical journal article on the affair by Dr. Samuel Jackson, published in 1829, not only reveals the discursive and literary aspects of scientific texts, but demonstrates the modesty required of experts in the courtroom. Moreover, I show that the history of arsenic poisoning expertise in the 19th-century parallels in some important respects the crisis in forensic science nowadays.

I conclude in Chapter 8 that the foregoing stories reveal important aspects of science and its interaction with legal processes and institutions. Challenging the idealized view of science as a catalog of stabilizing truths to be appropriated into law, the literary materials selected for this book reveal science to be a social enterprise involving public relations, cultural authority, contradictory self-images, ethical dimensions, and rhetorical strategies that together determine the place of science in law.

I consider this book to be introductory and suggestive, rather than comprehensive, with respect to the potential value, for law, of reflecting on stories of appropriated scientific expertise. Following the U.S. Supreme Court's opinion in *Daubert v. Merrill Dow Pharmaceuticals* (*Daubert* 1993), there was a barrage of scholarly interest and publication concerning the appropriate standards for judicial assessment of the scientific validity of expert testimony. Questions about the nature of science and scientific methodology, and whether the image(s) of

science developed by courts hearing cases involving scientific expertise were accurate or realistic, sustained numerous legal debates in the decade following *Daubert* (1993). And then, just as those debates might have died down, the so-called forensic sciences, especially identification techniques (other than DNA technologies) associated with police crime laboratories, began to come under a severe scrutiny that continues today. Questions about the nature of science and scientific methodology, and whether some forensic "sciences" are science at all, have therefore been revived in legal contexts. This book, in an indirect fashion due to its attention to presumably marginal (from a scientific perspective) literary and historical sources, focuses on and questions some of the contemporary images of science in law.

The project described in this book intersects with, benefits from, and sometimes builds upon the work of numerous scholars in law, literature, and/or science. First, in the wake of *Daubert*, Beyea and Berger identified two competing visions of science or "schools of thought" that judges alternatively draw upon in their judgments of scientific validity: (i) Science as Logical Reasoning, wherein science is viewed as an accessible catalog of truths, comporting "with the popular concept of a scientist doggedly collecting irrefutable facts" and moving "from observations or data to general laws of nature"; and (ii) Science as Process, wherein science is viewed as a contentious process of "intuition, conjecture, inference, professional judgment, and repeated testing," involving subjective elements in each step of the production of scientific knowledge (Beyea and Berger, "Scientific Misconceptions…," *Law & Contemp. Prob*. 64:328-330 (2001)). While one might criticize Beyea and Berger for setting up a superficial contrast between the so-called positivist tradition and a fairly conventional process account which they associate with Karl Popper and Thomas Kuhn, thereby appearing to be oblivious to decades of scholarship in science studies (or the sociology of scientific knowledge) that moves well beyond

Popper and Kuhn by identifying the role(s) of social, rhetorical, and institutional aspects of the production of scientific knowledge, it is nevertheless helpful to identify visions of science that matter in law and influence legal decisions. Moreover, the judiciary may well be limited, in its understanding of science, to a narrow set of conventional perspectives, and one of the purposes of this book is to try to broaden that horizon in mainstream legal discourse.

Second, in the debates over environmental protection, some have raised the notion of opposing "worldviews" concerning technological progress.

> The precautionary worldview approaches the uncertainties associated with any new technology with caution, placing substantial burden of proof on its proponents ... The opposite ... is [the] Promethean [worldview, reflecting] faith in the capacity of humans to manipulate complex systems for their own advantage ... (Levidow, "Precautionary Uncertainty…," *Soc. Stud. Sci*. 31:866 (2001)).

While these views probably reflect extremes of a continuum, and not clearly bounded positions (Levidow 2001:866), the dualism highlights the importance of cultural conceptions of scientific dangers and opportunities in making legal judgments. Recent work in the cultural cognition of risks indicate, for example, that individuals with an egalitarian or communitarian worldview seem to be skeptical concerning the risks associated with synthetic biology, but quite sensitive to the risks associated with global warming or nuclear power; conversely, those with hierarchical and individualistic worldviews seem to be skeptical about global warming or nuclear power risks, but quite sensitive concerning synthetic biology risks (Mandel et al., "The Cultural Cognition of Synthetic Biology Risks…," 2008). Similar research confirms that an image of nature as robust leads to greater tolerance of risk and more trust in science, whereas an image of nature as vulnerable leads to more concerns about risk and less trust in science (Schwartz and Thompson, *Divided We Stand*, 1990:2-4). Thus, in political and legal debates in the shadow of science,

> what are considered facts depends ultimately on an accepted framework of social (and therefore evaluative) premises. Even scientific knowledge, whilst perhaps not wholly fluid, is certainly plastic in the sense that it is socially negotiated (science being a social activity) and molded by values of various kinds (Schwartz and Thompson 1990:19).

Scientific authority and public trust in science are not given, but depend upon cultural images of science, thereby intertwining science with social frameworks.

Finally, the possibility of a law, literature, and science fiction enterprise was explored over a decade ago by Bruce Rockwood, who highlighted an unfortunate tendency in law and literature studies

> to focus on canonical literature, rather than literature more widely read. Science Fiction, while referred to in some law and literature collections and criticism, remains a largely unmined mother-[lode] for explaining our understandings of law through literature (Rockwood, "New Possibilities," *Leg. Stud. Forum* 23:267-8 (1999)).

In this perspective, science fiction (i) shapes "metaphors of everyday life, including those we use to view law and society"; (ii) explores political, legal and ideological alternatives ... and possible futures"; and (iii) has the potential to "explore and develop jurisprudential concepts" (Rockwood 1999:269, 271-272). Examples include Jeffrey Nesteruk's analysis of corporate law and personhood in the story of the android Lieutenant Commander Data in *Star Trek: The Next Generation* (Nesteruk, "A New Narrative…," *Leg. Stud. Forum* 23:281 (1999)), William Pencak's work on the Orpheus myth and technological subjugation in cyberpunk science fiction (Pencak, "Lyres Against the Law…," *Leg. Stud. Forum* 23:293 (1999)), Derrick Bell's science fiction parable about race, entitled "The Space Traders' Solution" (Bell, "The Power of narrative," *Leg. Stud. Forum* 23:318-345 (1999)), and the sustained argument by Kieran Tranter that attending to the works of science fiction is crucial for understanding the interaction of law and technology in numerous contexts, including the regulation of early automobiles (Tranter,

"The History of the Haste-Wagon…," *Melb. U. Law Rev*. 29(3):843 (2005)), and the cloning and stem cell controversies in Australia (Tranter, "Biotechnology…," *Law, Innov. & Tech*. 2(1):51 (2010)). Tranter offers compelling examples of how we draw our images of the dangers and potential benefits of technology from popular science fiction books and films.

This book, by contrast, is concerned with literary accounts (including several historical narratives) of the use or appropriation of science in legal contexts, but I am convinced, as are the scholars discussed above, that popular culture images of science have consequences for law. Our images of scientific authority (discussed in Chapters 3), of public scientific controversies (discussed in Chapter 4), of scientific expertise in the courtroom (discussed in Chapter 5), of the potential for erroneous science in law (discussed in Chapter 6), and of the ethical obligations of experts (discussed in Chapter 7) have everything to do with how science is appropriated in law. The sources selected for analysis in this book have the potential to create, confirm, and, by providing a critical distance or point of reflection, challenge the various cultural images of science that matter in legal contexts.