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Henry T. Greely

Mark M. Hernandez

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FOREWORD

TECHNOLOGY LAW: WHAT IS IT—AND WHAT SHOULD IT BE?

*Henry T. Greely & Mark M. Hernandez**

“What’s in a name? That which we call a rose
By any other name would smell as sweet.”

William Shakespeare, *Romeo and Juliet*, Act II, scene ii, 1-2.

JUST WHAT *IS* TECHNOLOGY LAW?

The law has always had to cope with technologies, internally and externally—from quill pens and horse-drawn carriages to typewriters and horseless carriages to computers and spacecraft—but it is only over the last few decades that American law schools have discovered, at least in some settings, “Technology Law.” One database of law journals and reviews contains 40 American law reviews under the subject of “Science, Technology, and Computers.”¹

On the other hand, few if any law schools seem to have courses called “Technology Law” or “Law and Technology.” The American Association of Law Schools (AALS) Directory of Law Teachers allows

* Henry T. Greely is the Deane F. and Kate Edelman Johnson Professor of Law; Professor, by courtesy, of Genetics; Director, Center for Law and the Biosciences; Stanford University. Mark M. Hernandez is Greely’s research assistant and a Stanford J.D. student in the class of 2010. Greely had the idea of this paper and drafted it; Hernandez was responsible for the collection and organization of the data. The two of them jointly hashed out what it meant.

1. The Washington and Lee database can be reached at <http://lawlib.wlu.edu/lj/>. On April 1, 2010, Greely searched for all U.S. journals under that subject. He also found 44 different journals under the subject “Health, Medicine, Psychology, and Psychiatry,” and 24 different journals classified as “Intellectual Property.” Some journals were listed in both topics—the overlap was particularly notable between the Technology and Intellectual Property categories. Of the 56 journals listed under Intellectual Property, 32 were also contained in the Science, Technology, and Computers. The Health category, on the other hand, had almost no overlap—one of its journals appeared in Science, Technology, and Computers and none appeared in Intellectual Property. There were also two journals indexed under “Air and Space.”

law professors to identify themselves as teaching one or more subject matter categories.² The list of “Law Teachers by Subject” for 2009-2010 gives faculty 104 different options.³ It includes nine categories that seem related to Technology Law—“Aviation and Space Law,” “Bioethics,” “Communications Law,” “Computers and the Law,” “Forensic Medicine,” “Health Care Law,” “Intellectual Property,” “Law and Medicine,” and “Law and Science”—but neither “Technology Law” nor “Law and Technology.”⁴

As someone who specializes in what I call “Law and the Biosciences”—the ethical, legal, and social implications of new bioscience discoveries—I have noticed that some people include biological issues within “technology law,” but others restrict technologies to the physical sciences, and particularly to computer-based technologies. An old division and rivalry between physics and biology seems to be alive, but inconsistently, in the understanding of this term.

So, what does Technology Law mean? What *should* it mean? And does it matter? This foreword will briefly explore both questions.

WHAT *DOES* LAW AND TECHNOLOGY MEAN?

In some languages—French is the obvious example—an authoritative body defines the language and its words, their meanings, spellings, and other attributes. English, in spite of regular handwringing about its decline and fall, has no language dictator. Various dictionaries, created by companies expecting to profit from selling them, may hope to influence spelling and usage, but the only real way to determine what words or terms mean in English is to see how people use them.

So who uses the terms “Technology Law” or “Law and Technology”? Lawyers and law firms that talk about their “Technology Law” or “Law and Technology” practices may be one large user. Many attorneys included in the Martindale-Hubbell Listings include in the description of their “practice areas” terms that use the word “technology,” such as Technology Law, Intellectual Property and Technology; Technology, Media, and Communications; Information

2. THE ASSOCIATION OF AMERICAN LAW SCHOOLS, *available at* <http://www.aals.org/> (last visited Apr. 5, 2010).

3. *Id.*

4. *Id.*

Technology; Technology and Science; and others.⁵ (An electronic search of the directory in Lexis/Nexis showed 765 attorneys in California alone with the word “technology” in the practice area segment).⁶ And law schools may also use the terms, even if the AALS does not recognize teachers by such a category. But, in spite of the wonders of Google’s technology, the meanings of the terms when used by either lawyers or law schools are not easily searchable. Law and Technology journals, however, can be searched and their contents examined to see how, in practice, *they* define the term.

The first part of this Foreword describes the results of some limited empirical research. We (that is, Hernandez) gathered the tables of contents of all issues with publication dates in or after 1999 for nine “technology law” journals:

Berkeley Technology Law Journal
Duke Law & Technology Law Review
Harvard Journal of Law & Technology
Journal of Technology Law and Policy
Jurimetrics (published at Arizona State University)⁷
Michigan Telecommunications and Technology Law Review
Stanford Technology Law Review
Virginia Journal of Law and Technology
Yale Journal of Law and Technology

We chose these journals largely because they came from some of the more prestigious law schools. According to the “combined ranking” from the Washington and Lee law review database, in 2009, these nine journals included the top four journals among the 40 members of the Science, Technology, and Computers category, as well as numbers six, 12, 14, 15, and 25.⁸

We then created some broad categories for defining the subjects of articles in these journals. Greely started with three general categories:

5. MARTINDALE HUBBLE LISTINGS, *available at* www.martindale.com (last visited Apr. 5, 2010).

6. Searched on April 1, 2010 with “PRACTICE-AREAS (technology) and STATE (california).” A search without a limitation to state returned a message that there were more than 3,000 results.

7. Jurimetrics is published by the American Bar Association’s Section of Science and Technology and the Center for the Study of Law, Science, and Technology at the Sandra Day O’Connor School of Law at Arizona State University. It is the only journal among these nine to be peer-reviewed.

8. WASHINGTON AND LEE RANKINGS AND SUBMISSIONS, *available at* <http://lawlib.wlu.edu/lj/> (last visited Apr. 5, 2010).

biology-related (“carbon-based”), computer-related (“silicon-based”), and “other.” Hernandez then refined this classification scheme as he reviewed the tables of contents for each issue. He subdivided the categories further, as follows:

Carbon-Based Articles

- Health and Medicine
- Genetics, Cloning, and Stem Cells
- The Human Brain
- Biotechnology

Silicon-Based Articles

- The Internet
- Computers and Software
- Media and Communications

Intellectual Property⁹

Other Articles

- Scientific Developments (and Their Consequences on the Law)
- Privacy and Security
- The Economics of Technological Developments
- Technology’s Influence on the Art and Science of Lawyering

From 1999 on, the nine journals published 1051 articles. Hernandez assigned each article to a primary category. Where he could make the assignment with confidence based on the title, he did so. When the title was unclear, he examined the article itself. When he believed that an article also had a second strong focus within these categories, he gave it a secondary classification. This was the case for 159 articles.

The resulting database can be mined in many different ways, and we are considering doing further analyses of it. For our present purposes, though, the resource can tell us, in a very concrete way, what “technology law reviews” treated as “Technology Law” topics, based on what they actually published. Here are the results:

Intellectual Property	<u>345</u>	<u>32.8%</u>
Silicon-Based Articles	<u>315</u>	<u>30.0%</u>
The Internet	197	18.7%

9. In making these decisions, Hernandez also made some judgments about where certain subcategories belonged. Most notably, he suggested that “Intellectual Property” be put in the Silicon-Based category because most of the intellectual property in these journals seemed to relate much more strongly to computer issues than to biological issues. After reviewing his work, Greely concluded that, given the sheer number of Intellectual Property articles and their broad scope, it made more sense to list them separately. A closer examination might usefully try to dissect out what kind of intellectual property issues the articles discuss.

Computers and Software	36	3.4%
Media and Communications	82	7.8%
Other Articles	<u>218</u>	<u>20.7%</u>
Scientific Developments (and Their Consequences on the Law)	64	6.1%
Privacy and Security	81	7.7%
The Economics of Technological Developments	45	4.2%
Technology's Influence on the Art and Science of Lawyering	28	2.7%
Carbon-Based Articles	<u>173</u>	<u>16.5%</u>
Health and Medicine	56	5.3%
Genetics, Cloning, and Stem Cells	92	8.8%
The Human Brain	9	0.9%
Biotechnology	14	1.3%

A few conclusions jump out of this table. Technology law reviews do, in fact, publish substantial amounts of work in all four major categories. No one category comprises a majority, or even close to a majority. Apart from Intellectual Property, which accounts for nearly a third of all the articles, only the Internet supplies the topic for more than 10% of the articles. The combined bioscience field of genetics, cloning, and stem cells is the next largest subcategory with nearly 9% of all articles.

A look at the underlying data makes it clear that the popularity of various topics and categories vary with time. Articles about cloning, not surprisingly, are more common in the early years of this sample; five of the nine articles about the brain are from 2009 and two of the remaining are from 2007 and 2008. Only 32 (about 1/6th) of the 197 articles about the Internet are from 2007 and later. It does seem, not surprisingly, that "Technology Law" shifts its contents over time as different technologies come into prominence.

Less obviously, different journals prefer different topics. Jurimetrics accounts for a disproportionate share of the articles on genetics, cloning, and stem cells; the Harvard Journal of Law and Technology provides a large share of the recent articles on the Internet. It is unclear whether these are the result of chance, though it is at least plausible that the interest of the host school's faculty may affect the topics student editors choose (and student authors write about). Thus, the concentration of recent Internet articles at Harvard may have some connection to the presence on the Harvard Law School faculty of Professor Jonathan Zittrain.

WHAT *SHOULD* TECHNOLOGY LAW MEAN?

Much more could be said about what the data indicate, but it will not be said in this Foreword. We want to turn from the descriptive question to the normative ones—what *should* technology law mean—and does it matter?

We will take the second question first. Yes, it does matter, or, at least, it *can* matter. Journals both reflect and create communities—of authors, readers, and editors. The subject matter that appears in a journal helps define what the community thinks of itself. If someone who identifies herself as interested in “Technology Law” looks at these nine journals, she will conclude that Technology Law is a broad term, broader than, say, just the silicon-based world. She will be exposed to people, topics, and ideas that she would not otherwise see. The journals’ contents will affect the contents of people’s minds, and hence of contents of the field.

Ironically, changes in technology may be undercutting some aspects of this field-creating function of journals. It used to be (when law students and law professors walked five miles barefoot through the snow to get to class, uphill in both directions) that reading a law review article meant picking up a physical law review, either a single issue or a (usually heavy and awkward) bound volume. Looking for an article on cloning would inevitably take the reader past pieces on the Internet or patent policy. A few people (though very few) would even get a subscription to the journal, or be on a distribution list for the journal, and would browse its contents. Now, for readers, that unavoidable browsing, with its occasional wonderful serendipity, is largely gone. An electronic search brings up *the* article the reader wants and not the one before it or the one after it. (This may have always been largely true of authors, who read the journal issue, if at all, in their own reprints, unless the issue contains several articles on their topic.)¹⁰

This field-defining benefit may, therefore, now be less important for general readers, but it still remains important for the editors, almost always students, who produce these law reviews. They will be reading submissions on a wide variety of topics and will understand the field as a mix of many topics. And, in the long run, it is the new people coming into the field who determine what that field means going forward. The experiences of the editors of the 40 American technology law reviews

10. In that case the author will certainly at least skim the other articles to see how, often, and whether he or she is cited—and may occasionally absorb more information from them.

are not insignificant in shaping the field of technology law. Assuming about 15 editors per journal per class, they would be roughly 600 new lawyers a year with a particular interest, and a broad understanding, of Technology Law.

But the preceding discussion just deals with whether the breadth of topics covered does matter. It does not address whether the reviews *should* define “Technology Law” broadly. I believe they should, for the following reason.

Scholarly communities provide value when their members connect with each other. A journal of “Law and Horses or Television” would not provide much extra value. Some people will be interested in the law of horses and some in the law of television, but they seem unlikely to have much to say to each other about their interests (apart from a possible appreciation of the old sit-com, Mr. Ed). Their knowledge and insights are unlikely to add value to each other.

I believe the opposite is true of Technology Law, broadly defined. The carbon-based scholars and the silicon-based scholars will have many different interests, but they will also have important shared interests.

Both fields are interested in privacy, albeit in very different ways. Greely recently was the only speaker of about 30 at a conference on privacy sponsored mainly by computer- and Internet-oriented groups. I was the only person to speak about the special issues concerning health privacy. (One other speaker talked about the carbon-based issues of forensic use of DNA). It was interesting and important for me to hear their very different perspectives; I think it was important for them to hear mine.

Both fields are interested in intellectual property, though, again, often in different ways. Movement on reforming the patent lines has long been stalled in Congress in part by the conflicting interests of the electronics industry, on the one hand, and the pharmaceutical and biotechnology industries on the other. Understanding each other’s perspectives may make compromise more likely—or at least make stalemate less frustrating.

Both fields are interested in forecasting the consequences of new technological developments and how societies and governments will attempt to deal with their introductions. The relative lack of regulation in the silicon-based fields contrasts sharply with the heavy regulation of

many carbon-based advances, performed by the Food and Drug Administration and others.

Certainly there are many issues that affect only one part of Technology Law, with few if any implications for other areas. But when important issues, or experiences, arise in different technologies, having forums to discuss them, and having trained lawyers who have some idea about both technologies, should prove quite useful.

CONCLUSION

“In real life, unlike in Shakespeare, the sweetness of the rose depends upon the name it bears. Things are not only what they are. They are, in very important respects, what they seem to be.”

Vice President Hubert H. Humphrey, March 26, 1966¹¹

We all live in many different overlapping circles. We are citizens, family members, students, teachers, readers, and writers. We form communities around our shared interests and some of those communities, like some of those interests, will be closer than others. The Internet Law community is different from the Patent Law community, which in turn is different from those that form around Law and Genetics or Privacy Law. But we can, and should, build higher-level communities when we have things of mutual interest and value to share.

At least as defined by the concrete reality of what is published in technology law reviews, Technology Law is now such a broad community. We need to recognize that breadth and to make sure that Technology Law not only *is* broad but seems broad. In that way we can help it remain broad, and broadly open to the inevitable new fields of law that science and technology will bring us—and, in so doing, help our law and our society maximize the benefits of new technologies and minimize their harms.

11. ROBERT ANDREWS, THE COLUMBIA DICTIONARY OF QUOTATIONS 616 (Columb. Univ. Press 1993 New York).