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“Technologies of the law/ law as a technology”

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Abstract
Historians of science and technology and STS practitioners have always taken intellectual property very seriously but, with some notable exceptions, they have typically refrained from looking “into” it. There is mounting evidence, however, that they can open up the black box of IP as effectively as they have done for the technosciences, enriching their discipline while making significant contributions to legal studies. One approach is to look at the technologies through which patent law construes its object – the invention – in specific settings and periods by examining procedures, classifications, archives, models, repositories, patent specifications (in both their linguistic and pictorial dimensions), and the highly specialized language of patent claims. More ambitiously, we could treat intellectual property as a technology itself. Patent law does not evolve either by merely articulating its doctrine in response to technological developments. The line between what does and does not count as invention may be redrawn with the emergence of new objects and technologies, but is not determined by them. It is this constructive feature of the law that we are trying to capture with the notion of law as technology. We hope that thinking about the technologies of the law and the law as technology will bring into question what we mean by both “technology” and “law”.

Keywords
Patents, intellectual property, technology, innovation, methodology

Intellectual property (IP) (patents, copyright, and trademarks) has come to frame our daily lives – from what we read, watch, and listen to, the technologies we use to do that (and pretty much everything else we do during the day), all the way to the brands we

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buy.¹ And as IP is now part of the everyday experience of people around the world, it is also playing an increasingly central role in the development of science and technology at all levels.² In the past, engineers and their employers sometimes sought patents for some of their inventions, but patenting has now become a key element of corporate innovation strategies, framing invention even before it happens, guiding investments and efforts toward areas and objects that may be patentable, or adding a strategic advantage to one’s patent portfolio relative to that of the competitors.³ Similar trends can be seen at the edge of academic science.⁴ While alternatives certainly exist – prizes and awards can provide incentives⁵ and social norms can regulate credit and priority⁶ – IP has now become an unavoidable, perhaps dominant, feature of any knowledge-based “business ecology.”

1. This special issue was developed in the framework of the conference “Ownership of Knowledge,” Max Planck Institute for the History of Science, Department III: Artifacts, Action, and Knowledge, November 9–11, 2016. We would like to thank all the participants for their helpful comments, and in particular Dagmar Schäfer for her continuous and generous support.


The various roles that patents have come to assume since the Industrial Revolution offers rich research material for historians of technology. Perhaps more important to scholars of constructivist sensibilities is the fact that, as patenting becomes increasingly pervasive and integral to innovation strategies, the law keeps articulating and revising what kind of things can and cannot be patented. From the patenting of biotechnology,^8^

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^8^ The literature on the historical development of biotechnological patents and more broadly of notions of ownership in the life sciences is vast, but good starting points are Keith Aoki, *Seed Wars: Controversies and Cases on Plant Genetic Resources and Intellectual Property*
software, diagnostic methods, and genetically modified organisms like the OncoMouse, the law not only protects and propertizes innovation but also revises, in ways that are as problematic as they are intriguing, what counts as nature, that is, where we draw the ever-contestable line between nature and technology, discovery and invention. The old view of patents as legal “tools” that the law “applied” to protect certain technologies has thus been replaced with one in which the interaction between law and technology develops both new articulations of patenting as well as new definitions of technology. This is perhaps most evident in the case of business methods, where the extension of patenting to cover ways of conducting or organizing business strongly signals that such practices amount to a technology, even though they do not involve any innovation that most people would consider to involve technology as we know it. The same may be said about copyright law. Traditionally, its role in the technosciences was limited to regulating scientific publishing, but that changed dramatically when, a few decades ago, it became central to the
protection of software. As Brad Sherman shows in his contribution to this volume, this was far from a mere “application” of copyright to software, but it involved a complex re-articulation of the difference (and similarity) between “text” and “machine” while effectively redefining both.

It would be unfair to say that past historians of science and technology have neglected IP. Quite to the contrary, patents and patenting activities have been often discussed by historians of technology, economic historians, and business historians, going back to the Renaissance and early modern period14 and, of course, to the


Industrial Revolution, when patenting became common. Typically, that work has focused both on specific charismatic inventors (Watt, Edison, Sperry, and

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others), on the broader social contexts and roots of inventive activity, and on the politics of IP and innovation.


But if historians of science and technology have taken patents very seriously, we believe that, with some notable exceptions, they have typically treated the law as a black box. We have careful studies of the role of patents in the articulation and dissemination of specific technologies, the changing models of technological development (from devices to systems), the tensions between corporations and skilled labor (through the work for hire doctrine), or the relation between patenting and technology transfer, among various other topics. While historiographically sophisticated, however, much of this literature has preferred to see and treat patents as the form inventions take when...
they become “clothed” by the law, rather than look more closely at how the law construes invention, and how that construction has changed over time. Similarly, economic and business historians have been counting and tabulating patents, treating their chronological trends and distribution across periods and countries as quantitative indicators of innovation and economic growth – something one added up rather than studied in detail. This approach has not changed in more recent studies using large data sets and complex network models. While quantitative studies of patents have ranged from informative to fascinating, the questions they pursued have not required them to look “into” IP.

For instance, there has been substantial discussion in the historiography of science and technology about what an invention is and how it may differ from a scientific finding or claim, but we have not, until recently, paid attention to the fact that the legal notion of invention differs significantly from what inventors and engineers (or historians of technology) mean by that term. (This is made patently clear when scientists and lawyers talk past each other during court proceedings). Conversely, STS practitioners have studied collaborative knowledge-making communities or the emergence of new fields like synthetic biology, often focusing on the constraints posed by IP and on the establishment of commons modeled on those promoted by the free software movement. Still, while STS has carefully studied laboratories and other sites of the technosciences, it has paid little

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attention to the practices and sites where IP law is articulated – patent offices, congressional hearings, courts of law, archives, depositories, and so on. In other words, there have been few attempts to look inside the law to study how it construes invention, in what sites and with what material and discursive technologies it does so.

The articulation of the new disciplinary and methodological space we propose here is not meant as a criticism of the approaches of previous scholars who have worked at the intersection of IP and the technosciences. Without their work, we would not be able to ask the questions we are posing now. What concerns us, and what we try to show through this special issue, is that historians of science and technology and STS practitioners can open up the black box of IP as effectively as they can that of the technosciences and that, in so doing, they can enrich their discipline while making significant contributions to legal studies. No doubt, this is not an easy task. Perhaps because of the technical density of the discipline, the mechanics of patent law have so far remained the province of expert lawyers, at least in terms of the capacity to represent or explain the peculiar language of the patent claim or the intricacies of patent prosecution. At the same time, for the same reason that scientists and physicians are rarely able to double as outstanding historians of science or medicine, the lawyers’ training and professionalization hinders their ability to double as historians of the interaction between law and technology, or to make the law as “strange” as sophisticated STS practitioners and historians can render the technosciences.

What is needed is a hybrid kind of scholar who can understand the concepts and practices of both the law and the technosciences, and the institutions (patent offices, law schools, patent agents and attorneys, patent examiner’s academies, and so on) that negotiate


the connections between the two. In the past, historians of technology or business and economic historians rarely developed the skills required to look at patents as artifacts in and of themselves rather than simply as means to secure the protection of certain technologies and innovations, but we are now beginning to see a growing number of historians and STS practitioners who can appreciate both the technosciences and the technologies of the law.

While the title of this issue refers to a field that is still emergent and thus difficult to define, we do not use “Technologies of the law” as a metaphor. Once we carefully look at how patent law construes its object—the invention—in specific settings and periods (and we do so with the same care and detail that a historian of technology would pay to an inventor’s development of a technology or device) it becomes clear that IP is much more than a text, a doctrine, or a specific form of enunciation, but that it involves a staggering amount of infrastructure, technologies, and labor. Setting aside the general question of where the law draws its authority from, tracing a patent application from pre-application work to the eventual grant demonstrates the indispensable function of the specific training of patent attorneys and examiners, of the bureaucracy of the patent office, of the system of patent classification (which frames the “species” of an invention and the scope of its examination), of the constitutive role of patent specifications in both their linguistic and pictorial dimensions, of the highly specialized language of

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patent claims (which is often unintelligible to the uninitiated), of repositories of patented biological materials and – in earlier periods – the role of patent models and of the museums that both stored and made them public.

Given the common tendency to think of the law as a body of doctrine or a form of enunciation, the claim that law has technologies may be already radical enough. We find it productive, however, to take a further step and start considering IP as a technology or a system of related technologies that produce all sorts of effects and objects well beyond the definition of invention, for example the definition of what elements of language may be protected as trademarks, or the way copyright may be made to protect software not as an invention but as an expressive text. Jurists would likely say that these developments are


doctrinal – articulations of the logic of the law – but we propose that they represent the development and recursive operation of the law as a technology.

While these infrastructures, “material forensics,” and media change in time, they never disappear to leave behind a purely discursive and doctrinal law. As Kang shows, the recent digitization of patent applications, their on-screen analysis, and the online modes of prior art search is changing the examiners’ sense of what the invention is, but do not return to or reach an unmediated, transparent apprehension of “invention.” In addition to these material technologies, we need to add the procedural rules, standards of evidence, canonical forms of argumentation, and discursive framing devices one finds deployed both in the statute and in the courtrooms where patents are challenged. Baudry’s contribution suggests that we should add “styles of patent examination” to this list of techniques. As he shows, French academic savants put in charge of examining patent applications in the post-revolutionary period construed patentable technology in a very specific fashion, distinct from and subaltern to academic science. Similarly, Arapostathis demonstrates how, in lawsuits involving the Marconi patents, the notion of patentable invention was construed by mobilizing specific types of expert witnesses, and specific historical accounts of discovery and invention – narratives that, we believe, should also be counted as technologies. Finally, Bellido’s and Pottage’s contribution shows that the integral role of technology is not limited to patent law, and that trademark law as we know it would not exist without dictionaries – tools that, while eminently mundane, also provide a key test for the validity of trademarks by functioning as archives of genericness against which the mark’s distinctiveness is to be judged.

The second half of our title – “law as technology” – may strike some readers as counterintuitive. No doubt, law as technology is less descriptive and more suggestive than “technologies of the law,” but we do not treat it as metaphor either. For instance, Biagioli’s contribution shows how the very existence and legitimacy of patent law depends on its purported ability to function as a balance establishing an equilibrium between the interests of the inventor and that of the public. That is, patent law has to function as an instrument, not only as a legal instrument but, effectively, as a political technology. More generally, we use the notion of law as technology to indicate, for instance, that patent law does not evolve

either by merely articulating its doctrine in response to technological developments, nor does it simply deploy its various technologies to draw a line between patentable and unpatentable technology as if that line was clear and distinct within the technology, or that, alternatively, there is a technology, distinct from the law, on which the law can draw lines as if on a blackboard. As Buning shows in this issue, analyzing the social-epistemological dimensions of a priority dispute about an early modern globe, legal categories are not ontologically determined but are constructed through an unsettled process of negotiation. The line between what does and does not count as invention (as well as the fundamental distinctions in other branches of IP between original and copy, distinctive and generic, idea and expression) are not drawn on some kind of medium but construed by the recursive operations of both the discourse and technologies of IP law. These distinctions may be redrawn with the emergence of new objects and technologies, but they are not determined by them. It is this constructive feature of the law that we are trying to capture with the notion of “law as technology,” a dimension that is sadly made invisible by statements that “the law always lags behind the development of technology,” as if the law only represents, however belatedly, the objects that the technosciences confront it with.

Thinking about the technologies of the law and the law as technology will, we hope, help us question what we mean by both “technology” and “law.” It may also help us reframe the complex assemblages that we used to call “intersections between science and law” as something that should be approached through subtler and more complex concepts that do not assume and reify the assumption that on one side we have technology (material) and on the other we have law (doctrinal or textual).

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