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The Supreme Court and Patents: Moving Toward a Postmodern Vision “Progress”?

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Cover Page Footnote

Professor of Law, Wake Forest University School of Law. I would like to thank Christine Nero Coughlin, Samuel Oddi, Ron Wright and Atolani Akinkuotu for their invaluable assistance and support in the preparation of this article. A special thanks to Margaret Chon for inspiring me to pursue this topic.

The Supreme Court and Patents: Moving Toward a Postmodern Vision of “Progress”?

Simone A. Rose*

This paper challenges the traditional “modernist” view that incentive-centered patent protection is essential to meet the constitutional mandate of providing exclusive rights for limited times to inventors in order to “promote progress of the useful Arts.” For a modernist society, industrial/economic growth is one of the key dimensions for measuring forward-moving progress. As modernists, we advocate that a robust exclusive rights scheme for inventors is necessary to incentivize research and development, which in turn stimulates economic growth and promotes progress. This is currently the “grand narrative” of patent law. Applying this narrative, Congress, the Patent and Trademark Office (“PTO”), and the courts have elevated the goal of incentivizing research as synonymous with promoting progress. As a result, what constitutes Section 101 patent-eligible subject matter has expanded over time to include “anything under the sun made by man.” The novelty, non-obvious and enablement/written description requirements are deemed adequate proxies for determining what is patentable and what remains in the public domain, without the need for specifically evaluating subject matter eligibility.

What we often neglect to explore in patent law, however, are the societal perils and risks wrought by the modernist incentive-

* Professor of Law, Wake Forest University School of Law. I would like to thank Christine Nero Coughlin, Samuel Oddi, Ron Wright and Atolani Akinkuotu for their invaluable assistance and support in the preparation of this article. A special thanks to Margaret Chon for inspiring me to pursue this topic.

centered paradigm. The flaw in the modernist patent narrative is that by focusing the measure of societal progress on technological advancement and economic growth, we fail to adequately balance other equally important measures of progress such as improving public health, sustainability and access to basic research tools. A radicalized modern view of patent law allows us to challenge the incentive-centered narrative of promoting progress and consider this narrative's impact on future discoveries, humanism, morality and the environment. The Supreme Court recently took a step in this direction by restoring a balanced view of subject-matter eligibility and questioning whether Congress needs to explore other paradigms for protecting certain patent-ineligible subject matter.

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INTRODUCTION

[T]he patent system represents a carefully crafted bargain that encourages both the creation and public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited time.¹

In recent attempts to strike the balance, Congress has tended to focus on the motivation to innovate [incentive] side of the balance and paid less attention to the impediment to innovation side, perhaps because innovators include well-funded lobbyists.²

In drafting the U.S. Constitution, the Founding Fathers took the time to consider what role the federal government should have in protecting writings and inventions created in the United States.³ Although many Framers had concerns about the anticompetitive effect of monopolies,⁴ in the end, they were persuaded by the Madisonian view that federal intellectual property protection was needed to promote both economic and overall societal “progress.”⁵ The final version of the Constitution’s Intellectual Property (“IP”) Clause acknowledged this tension between providing exclusive rights and promoting free market competition by instructing

¹ Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 63 (1998).

² Max Stul Oppenheimer, *The Time and Place for “Technology-Shifting” Rights*, 14 MARQ. INTELL. PROP. L. REV. 269, 305 (2012).

³ See Dotan Oliar, *Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress’s Intellectual Property Power*, 94 GEO. L. J. 1771, 1804–05 (2006).

⁴ See *id.* (citing debates between Thomas Jefferson and James Madison about monopolies and noting Jefferson as being a little more anti-monopolistic and arguing that the IP Clause “struck middle ground between their positions”).

⁵ See *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 5–9 (1966) (discussing the Patent Right as being based on the Constitutional mandate to “promote the progress of the useful arts” and noting that Congress should not attempt to enlarge this monopoly considering the “innovation, advancement or social benefits gained”).

Congress to provide these exclusive rights for “limited times” to authors and inventors for the specific purpose of promoting “the progress of Science [Copyright] and useful Arts [Patents].”⁶

Scholars continue to debate the range of legislative power provided by the IP clause and whether the “to promote progress” portion of the clause limits Congress to providing an exclusive rights framework that will in fact promote progress.⁷ The dominant view is that the progress portion of the IP clause is merely an introductory preamble that fails to limit Congress’s intellectual property power.⁸ Interestingly, the source of this view, *Nimmer on Copyright*, fails to cite any legal or textual argument supporting this position.⁹ Scholars and some courts counter the Nimmer view with the more persuasive argument that the only way to give true meaning and textual balance to the IP clause is to view

⁶ See U.S. CONST. art. I, § 8, cl. 8. (“To promote the Progress of Science [Copyright] and useful Arts [Patents], by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries”).

⁷ See *Graham*, 383 U.S. at 5 (explaining that the “promote progress” clause is both a grant of power and a limitation); see also Chon, *infra* note 16, at 98–99 (discussing the possible interpretations of the mandate for Congress’s patent power to promote progress and noting that some scholars view progress “as best promoted through market competition, while others have found in the patent and copyright clause a mandate for innovation”).

⁸ See Oliar, *supra* note 3, at 1781 (noting that the dominant reading of the IP clause interprets the Progress Clause as a “preamble of no operative effect” rather than a limitation); see also MELVILLE B. NIMMER & DAVID NIMMER, *NIMMER ON COPYRIGHT* § 1.03 (2004) (“This introductory phrase is in the main explanatory of the purpose of copyright, without in itself constituting a rigid standard against which any copyright act must be measured.”); 1 NIMMER at § 1.03[B] (“[T]he introductory phrase, rather than constituting a limitation on Congressional authority, has for the most part tended to expand such authority.”).

⁹ Although there are many variations in interpretation, the two dominant views are that the Progress portion of the IP clause is simply a non-binding preamble introducing Congress’s broad powers in implementing Patent and Copyright protection. Professors Melville and David Nimmer have been cited as advancing this view without supporting citations, yet this view has been followed by various courts. See Oliar, *supra* note 3, at 1781–82 (discussing four varying interpretations of the IP clause’s Progress and Exclusive Rights provisions and noting that courts, the U.S. government as well as other commentators follow the Nimmer view.); see also Jeanne C. Fromer, *The Intellectual Property Clause’s External Limitations*, 61 DUKE L.J. 1329, 1339 (2012) (discussing the text and structure of the IP Clause and crediting the Nimmers for advancing the proposition that the Progress portion of the IP clause is “nothing more than a non-binding preamble.”).

the progress portion of the clause as an express limit requiring Congress to ensure that any patent or copyright statute does in fact promote progress.¹⁰ Unlike Nimmer, these scholars provide solid historical evidence, structural analysis, legal precedent and policy arguments to support their position.¹¹

Once one accepts the promotion of progress as a limitation on Congress’s intellectual property power, one must define “progress.” By the time the United States won its independence, European culture was steeped in modernism, which extols the virtues of capitalism, industrial growth, global expansion and the development of military power.¹² Since the United States was the progeny of England, it is no surprise that we would adopt the “modernist” view of progress as developing a strong capitalist framework, sustained industrial and economic growth¹³ as well as

¹⁰ See *id.* at 1336, 1340–43.

¹¹ According to Fromer and Oliar, the other, more persuasive view from an historical, structural and policy position is that “the progress provision is an independent restriction.” Fromer, *supra* note 9, at 1336. Oliar in his article takes the time to piece together the Framers’ limited discussions on monopolies and the proposed structure of the IP clause to substantiate the Progress as a limitation view. Both Oliar and Fromer evaluate the structural composition of the IP Clause and persuasively argue that the non-binding precedent view is incorrect since it fails to give meaning to the first “empowerment” portion of the clause and goes against the natural textual reading or an ends-means relationship between providing exclusive rights (the means) to promote the end result of promoting progress. See Fromer, *supra* note 9, at 1339–1340; Oliar, *supra* note 3, at 1810–18. The Oliar and Fromer views are consistent with leading Supreme Court cases. See, e.g., *Graham*, 383 U.S. at 6 (noting that Congress should not attempt to enlarge the patent monopoly without considering the “innovation, advancement or social benefit gained thereby. . . . Innovation, advancement and things which add to the sum of useful knowledge are inherent requisites in a patent system, which by constitutional command must ‘promote the Progress of . . . useful Arts.’ This is the standard expressed in the Constitution and it may not be ignored.”); see also *Eldred v. Ashcroft*, 537 U.S. 186, 242–267, (2003) (Breyer, J., dissenting); *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124, 126–27 (2006) (Breyer, J., dissenting) (adopting the view that the progress provision serves as a limitation because “*too much* patent protection can impede rather than ‘promote the Progress of Science and useful Arts’”).

For an additional argument that Congress’s power to promote progress of science and the useful arts is not limited to patent and copyrights, see Edward C. Walterscheid, *To Promote the Progress of Science and Useful Arts: The Anatomy of a Congressional Power*, 43 IDEA 1, 7–8 (2002).

¹² *Id.* at 55–62.

¹³ *Id.* at 58–60.

military power.¹⁴ According to leading sociologist Anthony Giddens, a modernist society includes both capitalism and industrialism as two of its four basic dimensions.¹⁵ In its infancy, the United States was primarily an agrarian economy, with no true industrial base.¹⁶ Most of its creative expression and useful inventions came from Europe, or the Far East.¹⁷ A mechanism for promoting the creation of domestic intellectual property would prevent the United States from remaining perpetually dependent on the outside world. Thus, it is not difficult to hypothesize that the Framers' view of promoting progress envisioned the modernist paradigm of providing intellectual property rights that would incentivize artistic endeavors as well as research and development of the useful arts.¹⁸ This, in turn, would stimulate knowledge and

¹⁴ See AMERICAN HERITAGE COLLEGE DICTIONARY 1093 (Houghton Mifflin Co. 3d ed. 1993) (defining "progress" as "development or growth" or "steady improvement, as of a society or civilization"); see also ANTHONY GIDDENS, THE CONSEQUENCES OF MODERNITY 55–62 (1990) (discussing the dimension of modernity); ROUTLEDGE COMPANION TO POSTMODERNISM viii–x (Stuart Sim ed., 3rd ed. 2011) (discussing what constitutes "modernism").

¹⁵ GIDDENS, *supra* note 14, at 59 (outlining the four dimensions that control the dynamics of a modern society: 1) Capitalism (capital accumulation in the context of competitive labor and product markets); 2) Industrialism (transformation of nature: development of the "created or industrialized" environment); 3) Surveillance (control of information and social supervision); and 4) Military Power (control of the means of violence in the context of the industrialization of war)).

¹⁶ See *Economic Growth and the Early Industrial Revolution*, INDEPENDENCE HALL ASS'N, <http://www.ushistory.org/us/22a.asp> (last visited Feb. 2, 2013).

¹⁷ See *id.*

¹⁸ In 1949, Karl Lutz began this discussion in his seminal article. Karl Lutz, *Patents and Science A Clarification of the U.S. Constitution*, 18 GEO. WASH. L. REV. 50 (1949). In this piece, Lutz evaluates the legislative history and plain language to conclude that when discussing the IP Clause's mandate, the United States Patent System "should omit any reference to 'science,'" since this refers to copyright and global knowledge, and should use phrases similar to: "[t]o promote the useful arts," "[t]o promote the progress of technology," and "[t]o accelerate technological progress." Lutz, at 54. Later scholars further dissected what the framers meant by progress and introduced historical evidence such as the pre-constitutional debates between Jefferson and Madison, the scant legislative history and textual "plain meaning" analysis to substantiate the "promote progress" clause specifically limits Congress's intellectual property power and includes the vision of increasing our knowledge base and improving the economy. See, e.g., Malla Pollack, *What is Congress Supposed to Promote?: Defining "Progress" in Article 1, Section 8, Clause 8 of the United States Constitution, or Introducing the Progress Clause*, 80 NEB. L. REV. 754 (2001); Oliar, *supra* note 3, at 1781–82; Fromer, *supra* note 9, at 1339.

economic growth in the United States, thereby lessening our cultural and economic dependency on Europe.¹⁹ Arguably, the incentive-based view of patents and copyrights as engines for stimulating economic progress did in fact contribute to the modernist goal of industrial growth and improved socioeconomic status. By the twentieth century, the United States was a leader in technological development and one of the world’s military and economic superpowers.²⁰

Historically, the Supreme Court provided minimal guidance on the progress limitation of the IP clause as applied to the Patent Act. While many courts recited the IP clause as the foundation for Congress’s intellectual property power when evaluating patentability issues,²¹ few took the time to discuss how patent law

¹⁹ Margaret Chon, *Postmodern “Progress”: Reconsidering the Copyright and Patent Power*, 43 DEPAUL L. REV. 97, 119–20 (1993) (discussing how Eighteenth-Century Americans were aware and bothered by their socioeconomic and cultural dependence on Europe. Since the U.S. was a “net importer of ideas and technology,” the concept promoting progress in the useful Arts and Science (knowledge) would elevate the United States from a lesser-developed country to one of “improved global socioeconomic status.” Because many Framers feared the anti-competitive effects of monopolies, the IP clause also provided that these exclusive rights be provided for “limited times,” thereby ensuring the ultimate enrichment of the public domain); *see also* Fromer, *supra* note 9, at 1373 (““To promote the Progress of Science and useful Arts’ generally refers to the goal of encouraging the advancement of systematic knowledge, cultural knowledge, and technology.”).

Other scholars suggest that rather than having an Enlightenment theory of progress as a global proxy for “all is getting better,” the Framers as Federalists would view “Progress” as “a qualitative improvement of arts and science” by the spreading or dissemination of an increased number of writings or the useful arts. Under this theory, Congress can only grant limited exclusive rights to individuals when “those rights promote the spread of science and the useful arts.” *See* Pollack, *supra* note 18, at 773–79. Like Chon, Pollack ultimately advocates a post-modern, ever-evolving definition of progress when making this evaluation. *See* Pollack, *supra* note 18, at 778–79.

²⁰ *See U.S. Status as World’s Superpower Challenged by Rise of China (U.S. Favorability Ratings Remain Positive)*, PEW RESEARCH CENTER PUBLICATIONS (July 13, 2011), <http://pewresearch.org/pubs/2059/-superpower-china> (arguing that while the U.S. remains the dominant global superpower, Western European leaders acknowledge China as rivaling the U.S. for global economic supremacy).

²¹ *See, e.g.,* *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974) (stating that the Constitution grants the power to Congress to legislate in the area of intellectual property); *Luck’s Music Library, Inc. v. Ashcroft*, 321 F. Supp. 2d 107, 112 (D.D.C. 2004) (noting that the IP clause grants Congress the power to provide exclusive rights to inventors and authors); *U.S. v. Elcom Ltd.*, 203 F. Supp. 2d 1111, 1137 (N.D. Cal. 2002) (stating that “[u]nder the Intellectual Property Clause, Congress is empowered ‘to

specifically promotes progress. Instead, courts appear to accept that as long as the basic statutory requirements for patentability are met, providing the patent right per se promotes progress.²² Thus, Congress never reflects on how any proposed amendments to the Patent Act meet the constitutional mandate to promote progress,²³ and *Graham v. John Deere* remains one of the few patent cases in which the Supreme Court acknowledged that the progress clause of the constitution is a limitation that must be considered when evaluating patentability.²⁴ Despite the *Graham* mandate, some courts go so far as to hold that the “progress” portion of the IP clause is nothing more than an introductory preamble to the mandate of providing “exclusive rights for limited times.”²⁵

promote the Progress of Science and the useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”); *In re Comiskey*, 554 F.3d 967, 976 (Fed. Cir. 2009) (explaining that Article I, Section 8, of the Constitution is the provision that authorized Congress to create a patent system).

²² See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (explaining that Congress intended the statutory requirements of the Patent Act to be given wide scope so as to fulfill the constitutional and statutory goal of promoting progress); see also *In re Bilski*, 545 F.3d 943, 980 (Fed. Cir. 2008) (quoting *Chakrabarty*).

²³ But see 157 CONG. REC. S5410 (daily ed. Sept. 8, 2011) (statement of Rep. Hatch) (explaining that the bill, although not perfect, strikes a balance between providing inventors with exclusive rights to profit from their inventions and allowing information to be available for public knowledge and implying that this balance complies with constitutional mandate); see also 157 Cong. Rec. H4505 (daily ed. June 23, 2011) (discussing adding a grace period to the American Invents Act); Letter from the House Comm. on the Judiciary, America Invents Act (H.R. 1249) (explaining the America Invents Act will positively affect the interests of both innovators and the population as a whole) (May 23, 2011), available at <http://judiciary.house.gov/issues/Dear%20Colleague%2005232011.html>.

²⁴ *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 5 (1966) (stating that the clause is both a grant of power and a limitation).

²⁵ In sharp contrast, the Copyright Act contains numerous limitations, such as Fair Use, that reflect a careful balancing of incentivizing creativity against access and many copyright cases discuss of the significance of being mindful of promoting progress and preserving this balance when interpreting the Act. See 17 U.S.C.A. § 107 (2006); see also *Kelly v. Arriba Soft Corp.*, 336 F.3d 811, 820 (9th Cir. 2002) (stating that “the Copyright Act was intended to promote creativity, thereby benefitting the artist and the public alike. To preserve the potential future use of artistic works for purposes of teaching, research, criticism, and news reporting, Congress created the fair use exception.”); *Stewart v. Abend*, 495 U.S. 207, 228–29, (1990) (noting that “although dissemination of creative works is a goal of the Copyright Act, the Act creates a balance between the artist’s right to control the work during the term of the copyright protection and the public’s need for

Rather than engage in a constitutional discourse, courts were more likely to espouse the “grand incentive narrative” as a justification for broadening the patent right, noting that patents are essential to incentivizing research and development and that without them we would impede economic growth.²⁶ The goal of incentivizing research and development, then, is elevated to near synonymy with promoting progress of the useful Arts. As a result, courts and the United States Patent and Trademark Office (“PTO”) continue to broaden their understanding of what constitutes patent-eligible subject matter under Section 101 to include “anything under the sun made by man” as long as it is useful, novel, non-obvious and meets the written description and enablement requirements.²⁷ This paradigm requires elevating Sections 102,

access to creative works.”); *Eng’g Dynamics, Inc. v. Structural Software, Inc.*, 26 F.3d 1335, 1344–5 (5th Cir. 1994) (explaining that the limitations on copyright protection follow logically from the purpose of the Copyright Act: “to protect an author’s original, creative expression insofar as is compatible with general advancement of expressive arts and ‘the free use and development of non-protectable ideas and processes.’”). *See generally* *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992).

²⁶ *See, e.g., Kewanee*, 416 U.S. at 480–81 (“The patent laws promote this progress [from the IP clause mandate] by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development. The productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens.”); *see also Chakrabarty*, 447 U.S. at 315 (“The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting the ‘Progress of Science and the useful Arts’ with all that means for the social and economic benefits envisioned by Jefferson.”); *Ass’n for Molecular Pathology v. USPTO*, 653 F.3d 1329, 1368 (Fed. Cir. 2011) (Moore, J., concurring) (arguing that patent protection for genomic material, including isolated genes is crucial for continued innovation and economic growth of the biotechnology industry).

For a scholarly commentary lamenting the current imbalance that results from the incentive-based grand narrative, *see Oppenheimer, supra* note 2, at 269, 305 (“[Under the mandate of the IP Clause] there is room to reward innovators with exclusive rights while still reserving to the public sufficient rights to guard against stifling further innovation. In recent attempts to strike the balance, Congress has tended to focus on the motivation to innovate [incentive] side of the balance and paid less attention to the impediment to innovation side, perhaps because innovators include well-funded lobbyists.”).

²⁷ *See, e.g., In re Allapat*, 33 F.3d 1526, 1542 (Fed. Cir. 1994), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (erroneously citing the Supreme Court’s *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) for the proposition that the Supreme Court has acknowledged that Congress intended Section 101 to include “anything under the sun that is made by man.”). Like many courts citing the *Chakrabarty* case for this proposition,

103 and 112 to proxies for vetting eligible subject matter under Section 101.²⁸ Recently, the Federal Circuit did just that, in *CLS Bank International. v Alice Corporation Party, Inc.*²⁹ There, rather than making Section 101 subject-matter eligibility the threshold test for patentability, the court reduced Section 101 to “a general statement of the type of subject matter that is eligible for patent protection [with] . . . [s]pecific conditions for patentability to follow” in Sections 102, 103 and 112.³⁰ According to many courts, by broadly evaluating what constitutes patentable subject matter, we ensure “progress of the useful Arts,” which, as we have seen, is frequently equated with industrial growth.³¹ Implicit in this grand narrative is that, by creating a broad incentive to invent patentable subject matter, both the economy and society will flourish. This is the epitome of modernism, which, in its focus on economic advancement, is frequently devoid of considerations of human or

the Federal Circuit neglects the next part of the opinion which qualifies that “the anything under the sun” language found in the patent legislative history is subject to the common law exclusions of nature, physical phenomena, and abstract ideas. See *Chakrabarty*, 447 U.S. at 309.

²⁸ Since 1984 the PTO rules have allowed the patentability of genetic material, including isolated genes, without citing textual support for this interpretation. The Federal Circuit later argued that, to not view isolated genes as patentable subject matter would hurt the biotechnology industry’s twenty-five-year reliance on this unsupported rule. See *Ass’n for Molecular Pathology*, 689 F.3d at 1358 (Moore, J., concurring in part and dissenting in part). Even after the Supreme Court reigns in the Federal Circuit and reminds them of the significance of Section 101, they are still diminishing the role of Section 101 to serve as “the threshold test for patentability” and that District Courts can use 102, 103 and 112 as proxies. See generally *Diamond v. Diehr*, 450 U.S. 175 (1981) (explaining that Congress intended statutory subject matter to include anything under the sun that is made by man, thus, a claim for a physical and chemical process for molding precision synthetic rubber product falls within the categories of patentable subject matter); *In re Bilski*, 545 F.3d 943, 976 (Fed. Cir. 2008) *aff’d but criticized sub nom. Bilski v. Kappos*, 130 S. Ct. 3218 (U.S. 2010); *In re Nuijten*, 500 F.3d 1346, 1358 (Fed. Cir. 2007); *Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1064 (Fed. Cir. 1992); *In re Grams*, 888 F.2d 835, 837 (Fed. Cir. 1989).

²⁹ 685 F.3d 1341 (Fed. Cir. 2012).

³⁰ *Id.* at 1348 (holding that “[Section 101] need not always be addressed first, particularly when other sections might be discerned by the trial judge as having the promise to resolve a dispute more expeditiously or with more clarity and predictability”).

³¹ See *Chakrabarty*, 447 U.S. at 315 (“The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting ‘the Progress of Science and the useful Arts’ with all that means for the social and economic benefits envisioned by Jefferson.”); see also *Ass’n for Molecular Pathology*, 689 F.3d at 1358 (Moore, J., concurring in part and dissenting in part).

environmental impact.³² Such a view of promoting progress is focused on forward movement and will not consider moving backwards or sideways to prevent greater societal harm.³³

The flaw in the modernist patent narrative is that by focusing the measure of societal progress on technological advancement and economic growth, we fail to adequately balance other equally important measures of progress such as improving public health, sustainability, and access to basic research tools. This Article advocates adopting a radicalized modernist view of patent law that challenges the incentive-centered narrative of promoting progress and critically assesses this narrative’s impact on future discoveries, humanity, and the environment.

This Article is framed by the sociological constructs of modernism, radicalized modernism, and post-modernism.³⁴ Sociology, the study of human behavior, is useful to our purposes because it supplies valuable information about how we relate to each other, which can be used to help us understand how we structure various social institutions, including the law.³⁵ Modernism, the current societal paradigm, focusing on capitalism, industrialism and military power, helps us understand where we are.³⁶ Radicalized modernism, where society attempts to deconstruct the perils of modernism, forces us to question the status quo.³⁷ In sharp contrast, post-modernism is the utopian goal of a more holistic societal construct, which accounts for the perils of modernism and motivates us to effectuate any necessary changes or interpretations of the law.³⁸

³² See, e.g., Estelle Derclaye, *Eudemonic Intellectual Property: Patents and Related Rights As Engines of Happiness, Peace, and Sustainability*, 14 VAND. J. ENT. & TECH. L. 495, 525 (2012).

³³ See Chon, *supra* note 19, at 114–34 (arguing that the traditional modernist view of the IP clause’s Progress mandate should be abandoned and replaced with a post-modern or enhanced view of progress).

³⁴ I chose this construct after using Professor Margaret Chon’s seminal piece, *Postmodern “Progress”’: Reconsidering the Copyright and Patent Power*, 43 DEPAUL L. REV. 97 (1993) as part of my Advanced Copyright Seminar.

³⁵ See *id.* at 10–15.

³⁶ See *id.* at 48–49.

³⁷ See *id.* at 150.

³⁸ See *id.* at 54–55.

The first part of this Article explores sociologist Anthony Giddens' argument that, contrary to many assertions, the United States is still operating under the basic four dimensions of modernism: Capitalism, Surveillance/Control, Military Power and Industrialism. According to Giddens, we have yet to evolve into a "post-modern" order of multilayered democratic participation, a post-scarcity system, demilitarization and a humanization of technology.³⁹ Instead, we are currently in a state of "radicalized modernism" where we are beginning to question the modernist narratives in light of views of the past and future.⁴⁰ The ultimate goal of the radicalized modernist is to determine what aspects of our sociological framework are "true" and what should be modified or eliminated in moving toward the post-modern paradigm.⁴¹ The Article then applies Giddens' sociological construct to how courts and the PTO currently evaluate the patentability of biotechnology and genomic subject matter. I will establish that the current application of the incentive-centered patent narrative found in many biotechnology and genomic subject-matter eligibility cases fits squarely within the capitalist and industrial growth dimensions of modernism and fails to respond adequately to the sociological risks and perils as outlined by Giddens.

The second part of the Article applies the modernist theories of Giddens and, in the IP context, the postmodernist theories of Professor Margaret Chon to argue that a postmodern view of progress is more balanced and constitutionally sound than our current incentive-based modernist view and should be our ultimate goal. Finally, I contribute to this discussion by arguing that to fully evolve to a post-modernist view of progress, we must take the bold next step of evaluating the Patent Act from a radicalized modernist perspective to determine the impact of providing these

³⁹ See *id.* at 164–65.

⁴⁰ *Id.* at 149–150.

⁴¹ See, e.g., Constance Lever-Tracy, *Global Warming and Sociology*, 56 CURRENT SOC. 445, 453–55 (2008) (citing Giddens' explanation of radicalized modernity and Giddens' discussion of global warming as a product of human intervention, and discussing the radical modernist approach to global warming and how this approach involves "asking the kinds of questions about future directions that most sociologists believe they have now put behind them.").

incentive-centered exclusive rights on future discoveries, humanism, morality and the environment. I posit that the Supreme Court took a first step in *Mayo Collaborative Services v. Prometheus* by challenging the incentive-centered patent narrative and reinforcing the significance of Section 101’s subject matter eligibility requirement as the threshold test for patentability.⁴² There, the Court began to embrace the vision of the “Progress Project” by acknowledging access to basic building block research as a fundamental right which sometimes supersedes the presumptive power of patents to incentivize research.⁴³ The *Mayo* court also took a subtler, yet equally powerful, step from a radicalized modernist perspective—leaving the door open for Congress to determine whether certain patent-ineligible subject matter should still be protected under a more limited *sui generis* IP framework.⁴⁴

⁴² See generally *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

⁴³ *Id.* at 1303 (“And so cases have endorsed a bright-line prohibition against patenting laws of nature, mathematical formulas and the like, which serves as a somewhat more easily administered proxy for the underlying ‘building-block’ concern.”).

⁴⁴ See generally *id.*

I. COURTS MISTAKENLY VIEW “PROGRESS” THROUGH A MODERNIST LENS⁴⁵

A. *Modernity: A Background*

The one constant in attempts to define modernity or what constitutes a “modern social order” is that there is no constant.⁴⁶ Sociologists disagree on what serves as the foundation for “modernist” thought.⁴⁷ The Marx-centered view places capitalism at the center of modern society and holds that class struggle is its fundamental weakness.⁴⁸ Others, like Durkheim, focus on industrialism and the division of labor as the overarching dynamic in a modern society.⁴⁹ Still others, such as Weber, start with a capitalist set of ideas and values yet frame modernity in a discussion of “rationalization,” surveillance and expansion of consolidated power or the “nation-state.”⁵⁰

Anthony Giddens provides one of the more comprehensive definitions of modernity. According to Giddens, “‘modernity’ refers to modes of social life or organization which emerged in Europe from about the seventeenth century onwards and which

⁴⁵ One might question why place discussion of “constitutional progress” in the sociological context of modernism, radicalized modernism and post-modernism? Theoretically, the value of sociology is it that it supplies valuable information about us and how we relate to each other, which we can then use to gain control over how we structure various social institutions, including the law. This “control” parallels the control that the “physical sciences provide in the realm of nature.” GIDDENS, *supra* note 14, at 15. This led to researching numerous sociological discussions on modernism and post-modernism, some broad, some context-specific. Ultimately, I was struck by the following statement of Professor Anthony Giddens which takes this paradigm one step further: “Sociological knowledge spirals in and out of the universe of social life, reconstructing both itself and that universe as an integral part of that process.” *Id.* at 15–16. Thus, I posit that scholars should encourage Congress to reflect on the various social dynamics that frame the construct of our society and then in particular, the law. Modernism, the societal construct centered around capitalism, industrialism and military power, helps us understand where we are as a society. Radicalized modernism helps us question and challenge the status quo, while post modernism motivates us to effectuate the necessary changes.

⁴⁶ *See id.* at 39.

⁴⁷ *See id.* at 7 (discussing how classical founders of sociology differed in their views of the modernity).

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

subsequently became more or less worldwide in their influence."⁵¹ In his book, *The Consequences of Modernity*,⁵² Giddens synthesizes the various sociological views of modernity and proposes that modernity is "multidimensional on the level of institutions, and each of the elements specified by these various traditions [continues to] play some part [on modern society]."⁵³ Giddens describes the four interrelated organizational clusters or dimensions of modernity as: 1) capitalism (capital accumulation in the context of competitive labor and product markets); 2) industrialism (transformation of nature: we start developing and using technology to "improve" our surrounding environment); 3) military power (control of the means of violence in the context of the industrialization of war); and 4) surveillance (control of information and social supervision-the basis for the creation of nation-states, rather than tribal communities).⁵⁴ Within each dimension, Giddens encourages us to consider how modernity continues to impact the following dynamics: 1) the separation of time and space (abandoning the pre-modern localized society for the global society that no longer requires physical presence to develop relationships); 2) the development of disembedding mechanisms (the creation of symbolic tokens, such as money economies the abandonment of our spiritual base; our increased

⁵¹ *Id.* at 1. According to Giddens, "[m]odern organizations are able to connect the local and the global in ways which would have been unthinkable in more traditional [pre-modern] societies and in so doing routinely affect the lives of millions." *Id.* at 20.

⁵² *Id.*

⁵³ *Id.* at 12. Giddens discusses the three dominant sources of the dynamism of modernity: 1) the separation of time and space (getting away from localized activity and developing global connections); 2) the development of disembedding mechanisms (the creation of symbolic tokens such as money economies and the integration of "expert systems" into our ordinary life, with an abiding trust in science and technological development; and 3) a reflexive appropriation of knowledge. *Id.* at 53.

⁵⁴ *Id.* at 57–59. Giddens also posits that each dimension of modernity includes its own variation of the dynamics of modernism, namely, the separation of time and space, disembedding mechanisms and reflexivity of knowledge. *Id.* at 63. Globalization is also inherent in the breaking of time and space according to Giddens and he also represents the four modern dimensions of globalization as: 1) the world capitalist economy; 2) the nation-state system; 3) the world military order; and 4) the international division of labor. *Id.* at 65–78.

reliance on experts, science and technology as keys to growth); and 3) a reflexive appropriation of knowledge.⁵⁵

While this ever-evolving and elastic dynamism had a positive societal effect within each modernist dimension—we are now both an economic and military global “superpower”—it came at a price.⁵⁶ Surveillance and control developed at the expense of privacy and trust. Industrial growth came at the expense of a permanent class system.⁵⁷ Global communication and enhanced time and space required some sacrifice of local community and global trust.⁵⁸ Last, but not least, industrial and technological growth force us to live with the continued risks of nuclear holocaust, unequal access to basic technology, disruption of the ecosystem and potential environmental harm.⁵⁹

According to Giddens, there are two sets of adaptive responses to the perils and risks created by modernism. The first set we can view as conservative responses and the second set we can view as pessimistic and radical. Included in the conservative set, *pragmatic acceptance* reflects a willingness to go along with the status quo.⁶⁰ It is satisfied with temporary gains because pragmatic acceptance centers around the belief that society is powerless to effectuate true change.⁶¹ *Sustained optimism*, or “persistence of

⁵⁵ See *id.* at 16–17. Regarding reflexive knowledge, “[w]e are abroad in a world which is thoroughly constituted through reflexively applied knowledge, but where at the same time we can never be sure that any given element of that knowledge will not be revised.” *Id.* at 39.

⁵⁶ See, e.g., *id.* at 7 (“Modernity, as everyone living in the closing years of the twentieth century can see, is a double-edged phenomenon.”).

⁵⁷ See *id.* at 55 (noting that capitalism, one of the two distinct “organizational clusters” of modernity forms “the main axis of a class system”).

⁵⁸ See *id.* at 80 (contrasting pre-modern cultures, “where the local community always remains the basis of wider social organization” and modern societies where “we interact more or less continuously with others whom we either do not know well or have never met before—but this interaction takes the form of relatively fleeting contacts”).

⁵⁹ *Id.* at 124–134; see also BARRY SMART, *Postmodernity*, in KEY IDEAS 12 (Peter Hamilton ed., 1993) (citing Giddens for advocating the humanization of technology as key evidence of a much-needed paradigm shift from modernism to post-modernism).

⁶⁰ See GIDDENS, *supra* note 14, at 135.

⁶¹ *Id.* Giddens posits that pragmatic acceptance leaves society with perpetual anxiety, blocking out of reality and perpetual nightmares of an apocalyptic future. “Pragmatic acceptance is compatible with an underlying feeling-tone of pessimism or with the nourishment of hope—which may coexist with it ambivalently.” *Id.*

the attitude of enlightenment” is the second conservative adaptive response.⁶² Sustained optimism reflects continued faith in modernism and the ability of rationalization and providential reasoning of the enlightened to minimize risks and maintain a state of forward-moving progress.⁶³

At the opposite end of the spectrum, the pessimistic and radical adaptive responses or attitudes include *cynical pessimism* and *radical engagement*.⁶⁴ Giddens describes cynical pessimism as a “nostalgia for ways of life that are disappearing or a negative attitude toward what is to come.”⁶⁵ The problem with cynical pessimism is that while it acknowledges problems with the status quo, it uses cynicism and dark humor as a mode of survival without any “formula for action.”⁶⁶ On the other hand, *radical engagement* takes the proactive position of facing our major problems and encouraging society to “either reduce their impact or to transcend them.”⁶⁷

Giddens posits that as a society, we are now in a state of radicalized modernism (“RM”), where we have adapted an attitude of radical engagement and are now becoming involved and asking the hard questions about how to transform beyond “the institutions of modernity.”⁶⁸ Radicalized modernism acknowledges that we are caught up in dialectic of powerlessness and empowerment.⁶⁹ Yet, as a society, we continue to struggle with how we can learn from the past, consider the future, and move toward a post-modern “utopia” that is demilitarized, includes multi-layered democratic participation, and reflects a humanization of technology.⁷⁰ Unfortunately, in the area of patent law, it appears that we are behind the radicalized modernist curve and instead seem caught somewhere between pragmatic acceptance and sustained optimism.

⁶² *Id.* at 136.

⁶³ *See id.*

⁶⁴ *Id.* at 136–37.

⁶⁵ *Id.* at 137.

⁶⁶ *Id.* at 136–137.

⁶⁷ *Id.* at 137.

⁶⁸ *Id.* at 3, 149–50.

⁶⁹ *Id.* at 150.

⁷⁰ *Id.* at 160–164.

B. U.S. patent law: a modernist paradigm of “promoting progress” that fails to address its societal inadequacies and potential harms

1. Development of the incentive-centered patent paradigm

Under the Giddens paradigm, a modernist society includes both capitalism and industrialism as two of its four basic dimensions.⁷¹ By the time the United States won its independence, European culture was steeped in modernism, which extols the virtues of capitalism, industrial growth, global expansion and the development of military power.⁷² Since the United States was the progeny of England, it is no surprise that we would adopt the “modernist” view of progress as the development of a strong capitalist framework, sustained industrial and economic growth,⁷³ and military power.⁷⁴

During its infancy stages, the United States was primarily an agrarian economy without a true industrial base.⁷⁵ The Framers, as enlightened modernists,⁷⁶ drafted the Intellectual Property Clause of the Constitution to empower Congress to “promote progress” by providing federal intellectual property rights that would incentivize artistic endeavors, as well as research and development of the

⁷¹ *Id.* at 59 (outlining the four dimensions of a modern society as: “1) capitalism (capital accumulation in the context of competitive labour and product markets); 2) industrialism (transformation of nature: development of the ‘created environment’); 3) surveillance (control of information and social supervision); and 4) military power (control of the means of violence in the context of the industrialization of war)”).

⁷² *Id.* at 55–62.

⁷³ *Id.* at 58–60.

⁷⁴ *See supra* notes 13–14 and accompanying text; *see also* GIDDENS, *supra* note 14, at 55–62 (discussing the dimension of modernity); ROUTLEDGE COMPANION TO POSTMODERNISM viii–x (Stuart Sim ed., 3rd ed. 2011) (discussing what constitutes “postmodernism.”).

⁷⁵ *See* Walterscheid, *supra* note 11, at 15.

⁷⁶ *See* Walterscheid, *supra* note 11, at 10, 14; Pollack, *supra* note 18, at 775–76; *see also* Chon, *supra* note 19, at 122 (“The essential characteristics of Enlightenment as faith continue to dominate legal as well as other forms of discourse. Enlightenment perspectives which are still very much with us today include the privileging of individual-centered reasoning as a primary means of apprehending the world, the emphasis on empiricism or positivism as required characteristics of any intellectual project of integrity, and the continual insistence . . . that critical thinking (a more ‘progressive’ way of thinking) will point the way to transformative action.”).

useful arts.⁷⁷ This in turn would stimulate industrial development and economic growth in the United States, thereby lessening our cultural and economic dependency on Europe.⁷⁸ With this in mind, Congress developed a framework of federal patent and copyright law which provided exclusive rights for limited times, in exchange for adding this wealth of Science (copyrightable subject matter) and the useful arts (patentable subject matter) to our ever-expanding knowledge base.⁷⁹

Over time, in both copyright and patent cases, courts reinforced the modernist view that providing the incentive to innovate is directly related not only to increasing our knowledge base, but also to industrial and economic growth.⁸⁰ For example, in *Kewanee v. Bicron*,⁸¹ a case evaluating whether state trade secret protection is preempted by federal patent law, the Court explains how patents promote progress “through the introduction of new products and processes of manufacture into the economy,” thereby increasing employment and making better lives for our citizens.⁸² Similarly,

⁷⁷ See Walterscheid, *supra* note 11, at 1.

⁷⁸ See Chon, *supra* note 19, at 120 (discussing how eighteenth-century Americans were aware and bothered by their socioeconomic and cultural dependence on Europe. Since the U.S. was a “net importer of ideas and technology,” the concept promoting progress in the useful Arts and Science (knowledge) would elevate the United States from a lesser-developed country to one of “improved global socioeconomic status.”); see also Oliar, *supra* note 3, at 1810 (citing textual support for the literal meaning of the Progress Clause as “improvement of knowledge” and “advancement of human happiness.”); Fromer, *supra* note 9, at 1373 (“To promote progress of Science and useful Arts’ generally refers to the goal of encouraging the advancement of systematic knowledge, cultural knowledge, and technology.”).

Other scholars suggest that rather than having an Enlightenment theory of progress as a global proxy for “all is getting better,” the Framers as Federalists would view “Progress” as “a qualitative improvement of arts and science” by the spreading or dissemination of an increased number of writings or the useful arts. Under this theory, Congress can only grant limited exclusive rights to individuals when “those rights promote the spread of science and the useful arts.” See Pollack, *supra* note 18, at 773–79. Like Chon, Pollack ultimately advocates a post-modern, ever-evolving definition of progress when making this evaluation. Pollack, *supra* note 18, at 778–79.

⁷⁹ See generally Pollack, *supra* note 18.

⁸⁰ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974).

⁸¹ *Id.*

⁸² *Id.* at 480; see also *Brenner v. Manson*, 383 U.S. 519, 535 (1966) (“But a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion. ‘(A) patent system must be related to the world of commerce rather than to the realm of philosophy.’”).

in *Eldred v. Ashcroft*,⁸³ a copyright case, the Supreme Court cites its own precedent to opine that “[t]he economic philosophy behind the [IP] Clause . . . is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors.”⁸⁴

Nevertheless, the Framers were concerned about more than the modernist dimensions of capitalism and industrial growth when drafting the IP clause. Of equal importance was the fear that an overly broad exclusive rights scheme for patents and copyrights could have an anti-competitive effect and lead to some of the same problems faced by England under the Statute of Monopolies.⁸⁵ James Madison and Charles Pinckney⁸⁶ seemed more driven by the need for a uniform federal scheme for patents and copyright as a limited monopoly that would benefit the public.⁸⁷ Although there is virtually no legislative history surrounding the IP clause itself, some scholars view the IP clause as a compromise which included the first limitation “promoting progress” by incentivizing invention and writings to promote economic growth and increase knowledge, and the second limitation that any exclusive-rights granted to authors and inventors must be for “limited times” in order to create and preserve a robust public domain.⁸⁸ Thus, one could infer that the “granting of exclusive rights” portion of the IP clause reflects the Framers’ modernist goal of incentivizing industrial and economic growth within a capitalist framework.⁸⁹ In sharp

⁸³ *Eldred v. Ashcroft*, 537 U.S. 186 (2003).

⁸⁴ *Id.* at 214 (citing *Mazer v. Stein*, 347 U.S. 201, 219,(1954)).

⁸⁵ See Chon, *supra* note 19, at 139–41. Because many Framers feared the anti-competitive effects of monopolies, the IP clause also provided that these exclusive rights be provided for “limited times,” thereby ensuring the ultimate enrichment of the public domain; see also Olliar, *supra* note 3, at 1803 (“Despite the anti-monopolistic sentiment—however widely it was shared—a majority of the Framers probably saw intellectual property rights as ‘justified monopolies.’”); Walterscheid, *supra* note 11, at 37 (“[I]t is precisely because the delegates were familiar with the Statute of Monopolies either on legal or political terms that they were not about to give Congress any general power to create monopolies.”).

⁸⁶ Charles Pinckney is credited as being the drafter of the Constitution’s IP clause. Walterscheid, *supra* note 11, at 25.

⁸⁷ *Id.* at 24, 48.

⁸⁸ See Fromer, *supra* note 9, at 1331–32.

⁸⁹ See Walterscheid, *supra* note 11, at 36.

contrast, the “to promote progress” and “limited times” portions reflect a broader definition of progress that goes beyond a simple balancing of incentives with monopolies and is geared toward developing a robust public domain and ensuring adequate access to knowledge.⁹⁰

While the Copyright Act includes limitations such as fair use⁹¹ that reflect balancing public access against incentive,⁹² the Patent Act remains focused on the incentive-centered narrative.⁹³ It contains virtually no limitations reflecting concerns for public access, and it only addresses preserving the public domain through the twenty year term limitation and basic patentability requirements of subject matter, utility, novelty, non-obviousness and written description and enablement.⁹⁴ This lack of statutory balance is due in part to the failure of courts to fully explore the public access and sustainability aspects of “promoting progress” when evaluating patentability.⁹⁵

The 1829 case of *Pennock v. Dialogue* is one of the earliest patent cases referencing the IP clause’s main objective of

⁹⁰ See Chon, *supra* note 19, at 98–99; *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1292 (2012).

⁹¹ See Fair Use, 17 U.S.C.A. § 107 (West 2012).

⁹² See *Kelly v. Arriba Soft Corp.*, 336 F.3d 811, 820 (9th Cir. 2003) (“The Copyright Act was intended to promote creativity, thereby benefitting the artist and the public alike. To preserve the potential future use of artistic works for purposes of teaching, research, criticism, and news reporting, Congress created the fair use exception.”); *Stewart v. Abend*, 495 U.S. 207, 228 (1990) (noting that “although dissemination of creative works is a goal of the Copyright Act, the Act creates a balance between the artist’s right to control the work during the term of the copyright protection and the public’s need for access to creative works”); *Eng’g Dynamics, Inc. v. Structural Software, Inc.*, 26 F.3d 1335, 1344–45 (5th Cir. 1994) (explaining that the limitations on copyright protection “follow[] logically from the purpose of the Copyright Act: to protect an author’s original, creative expression insofar as is compatible with general advancement of expressive arts and ‘the free use and development of non-protectable ideas and processes’”), *opinion supplemented on denial of reh’g*, 46 F.3d 408 (5th Cir. 1995). See generally *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992).

⁹³ Matthew W. Coryell, Note, *Patent Law as an Incentive to Innovate Not Donate: The Role of the U.S. Patent System in Regulating Ownership of Human Tissue*, 36 J. CORP. L. 449, 451 (2011).

⁹⁴ See generally 35 U.S.C.A. § 102 (West 2002); 35 U.S.C.A. § 103 (West 2012); 35 U.S.C.A. § 112 (West 2012).

promoting the progress of Science and the useful Arts.⁹⁶ Unfortunately, the Court merely mentioned this limitation in the context of focusing on Congress's ability to merely grant patent rights for "limited times."⁹⁷ It was not until the 1966 case of *Graham v. John Deere*⁹⁸ that the Supreme Court articulated the constitutional command that the patent system must promote progress of the useful Arts. The *Graham* Court further emphasizes that this standard may not be ignored.⁹⁹

*Kewanee v. Bicron*¹⁰⁰ is one of the few patent cases decided after *Graham* that specifically references the Constitution's IP clause then goes on to explain how patent laws promote progress by incentivizing inventors to invest in developing patentable subject matter, which in turn has a "positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens."¹⁰¹ Unlike *Graham*, the *Kewanee* Court failed to discuss whether the progress clause does in fact limit Congress's intellectual property power.¹⁰²

Despite the existence of relatively straightforward precedent like *Graham* and *Kewanee*, later courts were more likely to forego any constitutional vetting of their application of the Patent Act when evaluating patentability, and some would go so far as to ignore the *Graham* mandate altogether and hold that the progress clause was *not* a limitation on Congress's intellectual property power.¹⁰³ Rather than engage in a constitutional discourse when evaluating patentability, courts were more likely to espouse the

⁹⁶ *Pennock v. Dialogue*, 27 U.S. 1, 19 (1829).

⁹⁷ *Id.* at 17. "[T]his could be done best, by giving the public at large a right to make, construct, use, and vend the thing invented, at as early a period as possible, having a due regard to the rights of the inventor." *Id.* at 19.

⁹⁸ *See Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 5 (1966)

⁹⁹ *Id.* at 6.

¹⁰⁰ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974).

¹⁰¹ *Id.* at 480.

¹⁰² *See generally id.*

¹⁰³ *See, e.g., Oliar, supra* note 3, at 1781–82 (citing a series of cases including *Hutchinson Tel. Co. v. Frontier Directory Co. of Minn.*, 770 F.2d 128, 130 (8th Cir. 1985), *Ladd v. Law & Tech. Press*, 762 F.2d 809, 812 (9th Cir. 1985), *Eldred v. Reno*, 239 F.3d 372, 378 (D.C. Cir. 2001), *Schnapper v. Foley*, 667 F.2d 102, 111–12 (D.C. Cir. 1981), *cert denied*, 455 U.S. 948 (1982)).

“grand incentive narrative” that we must broadly evaluate the patent right since patents are essential to incentivizing research and development (“R&D”) and that without them we would impede economic growth.¹⁰⁴ The goal of incentivizing R&D is then imbued with as much value as the promotion of the progress of the useful Arts. As a result, with respect to new technologies, courts and the PTO continued to broaden what constitutes patent eligible subject matter under Section 101 to include “everything under the sun as long as it is made by man” that is useful, novel, non-obvious and meets the written description and enablement requirements.¹⁰⁵ This paradigm requires elevating Sections 102, 103 and 112 to proxies for vetting eligible subject matter under Section 101.¹⁰⁶ This was recently done by the Federal Circuit in *CLS Bank International. v. Alice*.¹⁰⁷ There, rather than making Section 101

¹⁰⁴ See, e.g., *Kewanee Oil Co.*, 416 U.S. at 480–81 (“The patent laws promote this progress [from the IP clause mandate] by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development. The productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens.”); see also *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (“The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting ‘the Progress of Science and the useful Arts’ with all that means for the social and economic benefits envisioned by Jefferson.”); *Ass’n for Molecular Pathology v. USPTO*, 653 F.3d 1329, 1358–81 (2011) (Moore, J., concurring) (arguing that patent protection for genomic material, including isolated genes is crucial for continued innovation and economic growth of the biotechnology industry).

For a scholarly commentary lamenting the current imbalance that results from the incentive-based grand narrative see Oppenheimer, *supra* note 2, at 305 (“[Under the mandate of the IP Clause] . . . there is room to reward innovators with exclusive rights while still reserving to the public sufficient rights to guard against stifling further innovation. In recent attempts to strike the balance, Congress has tended to focus on the motivation to innovate [incentive] side of the balance and paid less attention to the impediment to innovation side, perhaps because innovators include well-funded lobbyists.”).

¹⁰⁵ See, e.g., *In re Alappat*, 33 F. 3d 1526, 1545 (1994); see also *supra* note 28 and accompanying text.

¹⁰⁶ Since 1984, the PTO rules have allowed the patentability of genetic material, including isolated genes, without citing textual support for this interpretation. Later, the Federal Circuit argued that to not view isolated genes as patentable subject matter would hurt the biotechnology industry’s 25-year reliance on this unsupported rule. See *Ass’n for Molecular Pathology*, 653 F.3d at 1358–81 (Moore, J., concurring in part and dissenting in part); see also *supra* note 28 and accompanying text.

¹⁰⁷ *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341 (2012).

subject-matter eligibility the threshold test for patentability, the court reduced Section 101 to “a general statement of the type of subject matter that is eligible for patent protection ‘subject to the conditions and requirements of this title.’ Specific conditions for patentability follow” in Sections 102, 103 and 112.¹⁰⁸ According to many courts, by broadly evaluating what constitutes patentable subject matter, we ensure “progress of the useful arts,” which, as we have seen, is frequently equated with industrial growth.¹⁰⁹

2. The problem with the incentive-centered patent narrative

Arguably, the incentive-centered view of patents and copyrights as engines for stimulating economic progress did in fact contribute to the modernist goals of developing a strong capitalist framework and stimulating industrial and technological growth.¹¹⁰ By the twentieth century, the United States was a leader in technological development and one of the world’s military and economic superpowers.¹¹¹ Also, the globalization of technology motivated the United States, and its fellow members of the Paris and Berne Conventions, to advocate for a global intellectual property treaty.¹¹² In 1994, the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) was enacted.¹¹³ Article 27.1 of TRIPS requires member states to provide uniform patent rights across technologies.¹¹⁴ Having uniform patent

¹⁰⁸ *Id.* at 1348.

¹⁰⁹ *See* *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980).

¹¹⁰ *See* Walterscheid, *supra* note 11.

¹¹¹ Robert Kagan, *Power and Weakness: Why the United States and Europe see the world differently*, POL’Y REV. at 5–6, (June-July 2002) <http://msuweb.montclair.edu/~lebelp/RKaganPowerAndWeakness2002.pdf> (explaining that after the Cold War, “America’s military power and particularly its ability to project that power to all corners of the globe remained unprecedented”).

¹¹² SUSAN K. SELL, *THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS* 164 (2003).

¹¹³ *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, *in* *The Legal Texts; The Results Of The Uruguay Round Of Multilateral Trade Negotiations* 320 (1999), 1869 U.N.T.S. 299 (1994). As part of the TRIPS agreement, the World Trade Organization (WTO) was established to enforce international trade agreements and TRIPS. SUSAN K. SELL, *THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS* 9 (2003).

¹¹⁴ TRIPS at art. 5.

protection among member states creates a global disincentive to infringe patented products that were placed into the global stream of commerce.¹¹⁵

What we often neglect to explore in patent law, however, are the societal perils and risks wrought by the modernist incentive-centered paradigm. Arguably, the over-patenting of basic technology creates the risk that downstream research and development will be impeded.¹¹⁶ The failure to “humanize” technology results in a patent system entrenched in a capitalist framework where incentivizing equals industrial/economic growth and individuals can be priced out of access to patented products/processes, such as pharmaceuticals and genetic testing.¹¹⁷ Also, since the patent narrative is devoid of any meaningful evaluation of potential environmental harms and sustainability concerns, we are currently facing these risks both globally and in the United States.¹¹⁸

¹¹⁵ See Todd Rowe, *Global Technology Protection: Moving Past the Treaty*, 4 MARQ. INTELL. PROP. L. REV. 107, 138 (2000) (explaining that the development of international intellectual property treaties is largely the work of American negotiators working with foreign negotiators in the hopes of crafting treaties which all members of the treaties can abide by in order to discourage patent infringement on a global scale); see also Marshall J. Welch, *International Protection of Intellectual Property*, 1 TEX. INTELL. PROP. L.J. 41, 50 (1992) (discussing the United States’ attempts to compel nations involved in piracy to treat intellectual property owners fairly).

¹¹⁶ See Supplemental Brief for Appellees, *Ass’n for Molecular Pathology v. USPTO*, 689 F.3d 1303 (2012) (No. 2010-1406) 2012 WL 2215682 at *10–11 (explaining that over patenting may impeded follow up and basic research); see also SECRETARY’S ADVISORY COMM. ON GENETICS, HEALTH, AND SOC’Y, DEP’T OF HEALTH AND HUMAN SERVICES, *GENE PATENTS AND LICENSING PRACTICES AND THEIR IMPACT ON PATIENT ACCESS TO GENETIC TESTING* (2010) at 53–54 available at http://oba.od.nih.gov/oba/SACGHS/reports/SACGHS_patents_report_2010.pdf; Heidi L. Williams, *Intellectual Property Rights and Innovation: Evidence from the Human Genome 27* (Nat’l Bureau of Econ. Research, Working Paper No. 16213, 2010) (noting that patenting genes had “persistent negative effects on subsequent scientific research”).

¹¹⁷ See GIDDENS, *supra* note 14, at 164 (advocating for a move beyond modern capitalism and identifying humanization of technology as one of four elements of a post-modern society).

¹¹⁸ See, e.g., Shawn J. Kolitch, *The Proper Scope of Patentability in International Law*, 11 MARQ. INTELL. PROP. 149, 163–65 (2007) (noting that U.S. patent law requires patents to be granted without consideration of possible and often well recognized environmental harms); Sarah Tran, *Expediting Innovation*, 36 HARV. ENVTL. L. REV. 123, 137 (advocating for expedited review of patents regarding socially (particularly

Applying the Giddens framework, the best response to addressing these “perils of modernism” is for Congress and the courts to radically engage in a constitutional and public-policy discourse on how to structure and interpret patent law in a way that best meets the constitutional mandate of promoting a balanced concept of progress. Unfortunately, courts and Congress seem to be trapped between the “status quo” constructs of pragmatic acceptance and sustained optimism. In some instances, courts applying sustained optimism use the incentive-centered narrative to persuade us that the modernist paradigm is working and the incentive-centered narrative is in fact minimizing risks (by adequately balancing incentive and preserving access) and maintaining a state of forward-moving progress.¹¹⁹ Other times, courts and Congress appear to operate in a state of pragmatic acceptance where they feel forced to accept the status quo resulting from the incentive-centered narrative and applaud temporary steps forward, such as enacting Section 27 of the America Invents Act, requiring the PTO to study the effect of exclusive licenses on genetic diagnostic testing activity.¹²⁰ This cycle of pragmatic acceptance and sustained optimism is reflected in the Supreme Court and Federal Circuit’s evaluation of Section 101 subject-matter eligibility for areas of new technologies, such as computer-implemented business methods¹²¹ and biotechnology.¹²²

environmentally) beneficial technologies to address sustainability concerns such as climate change).

¹¹⁹ 157 CONG. REC. H4420-06 (daily ed. June 22, 2011) (statement of Rep. Wasserman Schultz) 2011 WL 2472415 (proposing that the AIA included a limitation allowing for use of patented material for genetic testing). Unfortunately this proposal was later withdrawn and replaced with a requirement that the USPTO conduct a study on the impact of exclusive licenses for genetic material on the public.

¹²⁰ Leahy-Smith America Invents Act, Pub. L. No. 112-29, sec. 27(a), 125 Stat. 284, 338 (2011) (codified as amended in scattered sections of 35 U.S.C.)

¹²¹ See generally *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *CLS Bank Int’l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341 (2012); Peter S. Menell, *Forty Years of Wondering in the Wilderness and no Closer to the Promised Land: Bilski’s Superficial Textualism and the Missed Opportunity to Return Patent Law to its Technology Mooring*, 63 STAN. L. REV. 1289, 1307 (2011).

¹²² See Menell, *supra* note 121, at 1307; Allen K. Yu, *Within Subject Matter Eligibility—A Disease and a Cure*, 84 S. CAL. L. REV. 387, 408–11 (2011).

II. SECTION 101 SUBJECT MATTER ELIGIBILITY AND NEW TECHNOLOGIES: THE INCENTIVE-CENTERED NARRATIVE OF MODERNISM DISRUPTS THE BOUNDARIES OF PATENTABILITY

[T]he lack of a clear roadmap for determining the boundaries of patentability, the Supreme Court’s reluctance to weigh in on these questions in a timely manner, the Federal Circuit’s inclination toward expansive patentable subject matter, the incoherence and vagueness of the Supreme Court’s opinions, and the constitutional and political impediments to legislative action on patent reform have inclined the system reflexively toward expansive patentable subject matter whether or not it comports with good policy or constitutional, jurisprudential, and statutory limits.

. . . [This] reflects the confluence of two powerful independent forces. The opening of vast new technological fields—as has occurred in digital technology and biotechnology—presents unprecedented challenges to jurists¹²³

A. Introduction

Despite the fact that we are now on our third variation of the federal patent statute,¹²⁴ the text outlining what constitutes patent-eligible subject matter remains the same. In both the 1952 Patent Act and America Invents Acts (“AIA”),¹²⁵ Section 101 provides:

Whoever discovers any new and useful, process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may

¹²³ See Menell, *supra* note 121, at 1307.

¹²⁴ See Patent Act of 1952, Pub. L. No. 593, 66 Stat. 792 (1952) (codified as amended at 35 U.S.C. § 1 *et. seq.* (2000)); Leahy-Smith America Invents Act, Pub. L. No. 112–29, § 27(a), 125 Stat. 284, 338 (2011).

¹²⁵ Note that original patent act contained virtually the same language, but with minor differences.

obtain a patent therefor, subject to the conditions and requirements of this title.¹²⁶

Ironically, unlike the Copyright Act which specifically outlines excluded subject matter,¹²⁷ each iteration of the Patent Act fails to address its exclusions. Instead, we must rely on common law for guidance as to what constitutes patent-ineligible subject matter. While the law is clear that the three main categories of excluded subject matter are laws of nature, scientific principles, and abstract ideas,¹²⁸ there is little consistency on what guidelines courts should apply when determining if an invention falls within one of these three classes of patent-ineligible subject matter. What further complicated matters is that true to our modernist roots, developers of new technologies often assumed that a robust patent portfolio was crucial for effectively competing in industry, attracting investors and economic growth.¹²⁹ As noted by Peter Menell, “[a]s these investments [in patents] increased, industry players had more

¹²⁶ 35 U.S.C. § 101.

¹²⁷ See 1976 Copyright Act, Pub. L. 94-553, § 102(b), 90 Stat. 2541–98 (1976) (codified as 17 U.S.C.A. § 102(b) (2010) (West)). Section 102(b) states that “[i]n no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.”

¹²⁸ See *LeRoy v. Tatham*, 55 U.S. 156, 175 (1852) (cited by numerous cases, including *Funk Bros. Seed Co. v. Kalo Inoculant*, 333 U.S. 127, 130 (1948) (“For patents cannot issue for the discovery of the phenomenon of nature.”); *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (citing *Parker v. Flook*, 437 U.S. 584 (1978)); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)).

¹²⁹ See Menell, *supra* note 121, at 1305; see also ERNST & YOUNG, BEYOND BORDERS GLOBAL BIOTECHNOLOGY REPORT 30 (2011) (noting that the biotech industry experienced upper double-digit growth for the second half); see also *id.* (noting that smaller biotech companies continued to grow at close to high double-digit rates for the last half). See ERNST & YOUNG, *Despite Renewed Growth in 2010, Biotech Industry Faces R&D Challenges* (June 14, 2011), http://www.ey.com/GL/en/Newsroom/News-RELEASES/Beyond-borders_global-biotechnology-report-2011; see also Rob Waters, *Boom Times for Genomics Startups*, BLOOMBERG BUSINESSWEEK (Mar. 17, 2011). See Justin Kuepper, *Regenerative Medicine Starts to Attract Attention from Investors*, BIOTECH STOCK TRADER (July 26, 2011), <http://biotechstocktrader.com/regenerative-medicine-starts-to-attract-attention-from-investors-266/> (providing cited statistics and noting that “regenerative medicine will cause a paradigm shift in drug discovery and medicine”).

to lose from court decisions erasing those investments, even if the industry's trajectory was brighter without patents."¹³⁰

Without clear guidance from the Supreme Court as to the subject-matter boundaries, the incentive-centered paradigm of "more patents, more innovation" and economic growth¹³¹ led to a patent-centric view, with patent lawyers leading the charge for corporate, industry and trade-policy groups.¹³² Since modernism centers on capitalism and industrial growth, one must agree with Menell that the patent-centric view was destined to and indeed ultimately permeated "the executive, legislative and judicial arenas."¹³³ For courts, this resulted in an unprecedented expansion of the boundaries of subject matter for emerging technologies such as software, computer-implemented business methods and biotechnology. Not surprisingly, the Federal Circuit was often the pro-patentee court that expanded the subject-matter boundaries with sustained optimism.¹³⁴ Until recently, the Supreme Court's

¹³⁰ See Menell, *supra* note 121, at 1305.

¹³¹ Menell describes this modernist platform as "more patents equal more innovation." *Id.* He also argues that "public choice theory and empirical evidence suggest that the Federal Circuit, as a court specializing in patent adjudication would be pro-patentee and inclined toward expanding the scope of patentable subject matter." *Id.* The recent line of biotechnology cases decided by the Federal Circuit, such as *Ass'n for Molecular Pathology* and *Mayo*, as well as the latest computer implemented business method case *CLS Bank Int'l*, seem to support the pro-patent view of the Federal Circuit when deciding subject matter eligibility cases; see also Graeme B. Dinwoodie & Rochelle C. Dreyfuss, *Patenting Science: Protecting the Domain of Accessible Knowledge*, in *THE FUTURE OF THE PUBLIC DOMAIN: IDENTIFYING THE COMMONS IN INFORMATION LAW* 192, 193 (Lucie Guibault & P. Bernt Hugenholtz eds., 2006) (expressing the view that the continued patenting of upstream bioproducts, which are more like scientific principles than inventions, is a prime example of the Federal Circuit's patent dominated view on innovation").

¹³² See Menell, *supra* note 121, at 1305

¹³³ *Id.* at 1306 (citing and quoting *Diamond v. Diehr*, 450 U.S. 175, 217 (1981) (Stevens, J., dissenting) (observing that in *Gottschalk v. Benson*, 409 U.S. 63 (1972), *Parker v. Flook*, 437 U.S. 594, 598 (1978), and *Diehr*, "the spokesmen for the organized patent bar have uniformly favored patentability and industry representatives have taken positions properly motivated by their economic self-interests,' and that '[n]otwithstanding fervent argument that patent protection is essential for the growth of the software industry, commentators have noted that this industry is growing by leaps and bounds without it'").

¹³⁴ See also Menell, *supra* note 121, at 1305 (arguing that "public choice theory and empirical evidence suggest that the Federal Circuit, as a court specializing in patent adjudication, would be pro-patentee and inclined toward expanding the scope of

response on appeal was one of pragmatic acceptance of the Federal Circuit's modernist views.¹³⁵ A review of some key subject matter eligibility cases in the rapidly expanding biotechnology and genomics areas will shed some light on this trend.¹³⁶

*B. The PTO and the courts expand the boundaries of subject matter eligibility to broaden the patentability of biotechnology and genomic subject matter*¹³⁷

In *Funk Brothers v. Kalo*,¹³⁸ the Supreme Court held that a novel mixture of several naturally-occurring species of bacteria remained an unpatentable "work of nature."¹³⁹ Although the

patentable subject matter"). *Id.* at 1306–07. The recent line of biotechnology cases decided by the Federal Circuit, such as *Ass'n for Molecular Pathology* and *Mayo*, as well as the latest computer implemented business method case *CLS Bank Int'l*, seem to support the pro-patent view of the Federal Circuit when deciding subject matter eligibility cases.

¹³⁵ See *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124 (2006) (Supreme Court majority declines to hear appeal). *But see id.* at 126–27 (Breyer, J., dissenting).

¹³⁶ I will not discuss the software cases since numerous scholars have discussed the trilogy of *Gottschalk*, *Parker*, and *Diehr*, as illustrative of the Supreme Court's trajectory towards broadening what constitutes patentable subject matter under Section 101 in the area of software. Initially, in *Gottschalk*, the court found the binary-conversion software to be a patent-ineligible algorithm. *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972). Here, the court cites the necessity of keeping mathematical formulas in the public domain as a basis for drawing its boundaries. *Id.* at 71–72. Later in *Parker*, the court utilizes the same principle to hold that software which calculated updated alarm limits was patent-ineligible since it was no more than an integration of the algorithm into a formula could not elevate it to patent-eligible subject matter. *Parker v. Flook*, 437 U.S. 594, 598 (1978). Yet, four years later, a sharply divided court broadened the boundaries of subject-matter eligibility by distinguishing that if the process utilizing the algorithm/program results in physical and chemical transformation-it falls within Section 101 patent-eligible subject matter. See Menell, *supra* note 121, at 18; Andrew Beckerman-Rodau, *The Problem with Intellectual Property Rights: Subject Matter Expansion*, 13 YALE J.L. & TECH. 36, 76–80 (2011).

¹³⁷ Other scholars have outlined the broadening of patentable subject matter in the computer implemented business method cases such as *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368 (Fed. Cir. 1998) *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) and the confusion and inconsistency in analyzing subject-matter eligibility cases such as *Bilski*. See generally Lemley, Risch, Sichelman & Wagner, *Life After Bilski*, 63 STAN. L. REV. 1315 (2011); see also Menell, *supra* note 121.

¹³⁸ *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948).

¹³⁹ See *id.* at 131 (1948).

patentee had manipulated and mixed several species of non-inhibitive root-nodule bacteria, the Court reasoned that the end product was a patent-ineligible product of nature because the human intervention did not result in a product biologically different from its naturally-occurring counterparts.¹⁴⁰ In 1984, the Supreme Court was faced with a new dilemma in *Diamond v. Chakrabarty*. There, the patented product was bacterium that had been genetically altered to break down crude oil material.¹⁴¹ Since *Funk* was controlling precedent, the Court had to compare the *Funk* and *Chakrabarty* inventions to determine if *Chakrabarty*'s was distinguishable as patentable subject matter.¹⁴²

The *Chakrabarty* Court begins the discussion by placing the IP Clause's progress mandate in the modernist context of equating progress with socioeconomic growth.¹⁴³ More specifically, it cites *Kewanee*¹⁴⁴ for establishing that the "exclusive rights for limited times" provided by patent law promotes progress and has a positive effect on society by increasing the number of products entering into the economy and also increasing employment, thereby improving our overall quality of life.¹⁴⁵ Later, when addressing the petitioner's argument that the policy-balancing necessary to determine whether genetically engineered organisms are patentable is best left to Congress, the Court again focuses on incentive-centered progress by opining that Section 101 is "cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of Science and the useful Arts' with all that means for the social and economic benefits envisioned by Jefferson."¹⁴⁶

¹⁴⁰ *Id.* ("The bacteria perform in their natural way. Their use in combination does not improve in any way their natural functioning. They serve the ends nature originally provided and act quite independently of any effort of the patentee.").

¹⁴¹ *Diamond v. Chakrabarty*, 447 U.S. 303, 305 (1980).

¹⁴² *Id.* at 310.

¹⁴³ *Id.* at 307.

¹⁴⁴ *Kewanee Oil Co. v. Bicon Corp.*, 416 U.S. 470 (1974).

¹⁴⁵ *Chakrabarty*, 447 U.S. at 307 (quoting *Kewanee*, 416 U.S. at 480 ("The authority of Congress is exercised in the hope that '[t]he productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens.'")).

¹⁴⁶ *Id.* at 315.

Nevertheless, the *Chakrabarty* court reached the right result in holding that the genetically engineered bacterium qualifies as patent-eligible subject matter. The Court correctly reasoned that unlike the mixture in *Funk*, “the [*Chakrabarty*] patentee has produced a new bacterium with *markedly different* characteristics from any found in nature His discovery is not nature’s handiwork, but his own; accordingly it is patentable subject matter under § 101.”¹⁴⁷

Arguably, because the *Chakrabarty* Court based its analysis on the incentive-driven version of progress, it felt no need to engage in equally helpful policy discussions concerning the value of *Chakrabarty*’s bacterium to addressing environmental harms, such as crude oil spills. This would have facilitated a broader vision of drawing patentability boundaries and a more balanced vision of promoting progress.¹⁴⁸ Instead, the Court is probably best known for its partial and misleading quote that “Congress intended statutory subject matter to include anything under the sun that is made by man.”¹⁴⁹ While the Federal Circuit has repeatedly used this quote to diminish Section 101’s subject matter requirements and limitations, the *Chakrabarty* Court made it clear in its opinion that the patentability of “anything under the sun that is made by man” language was subject to the exclusions of laws of nature, physical phenomena, and abstract ideas.¹⁵⁰ Unfortunately, the *Chakrabarty* Court’s sustained optimism that later courts and the PTO would thoroughly apply Supreme Court precedent and carefully evaluate Section 101 as a threshold matter was not to be realized.

¹⁴⁷ *Id.* at 310 (emphasis added).

¹⁴⁸ Instead, the court gave little weight to the Petitioner’s arguments concerning the dangers of patenting genetic research in general and the broader policy issues, such as the parade of horrors that might result from the patenting of genetically engineered organisms. The Court was emphatic that it was up to Congress, rather than the Supreme Court, to evaluate such policies and determine whether specific limitations should be placed in the Patent Act; without this the Court should interpret Section 101. *Id.* at 316–17.

¹⁴⁹ *Id.* at 309. As pointed out by many commentators and a few courts, the Committee Report quoted went on to include the limitation that anything under the sun made by man is subject to Section 101 and the remaining requirements of the Patent Act. *See* S. REP. NO. 82-1979, at 2399 (1952); H.R. REP. NO. 82-1923, at 6 (1952).

¹⁵⁰ *Chakrabarty*, 447 U.S. at 309.

For example, in 2001 the PTO used the *Chakrabarty* “everything under the sun made by man is patentable” sentiment, without any detailed legal analysis or limitations, to sweepingly assert in its Examination Guidelines that isolated genes constitute patent-eligible subject matter under Section 101 of the Patent Act because “an isolated an purified DNA molecule . . . does not occur in that isolated [chemical] form in nature.”¹⁵¹ According to the Guidelines, isolated genes are patentable as chemical compounds under Section 101, if they meet the other statutory criteria for patentability (Sections 102, 103 and 112).¹⁵²

The Federal Circuit adopted the PTO Guidelines view of isolated genes as “chemical compounds,”¹⁵³ rather than “biological information,” and concluded that the BRCA 1 and BRCA 2 isolated genes constituted patent-eligible subject matter.¹⁵⁴ In *Association for Molecular Pathology v. U.S. Patent and Trademark Office* (commonly known as the Myriad case),¹⁵⁵ Judge Lourie, writing for the majority, held that the isolated genes and the human-engineered isolated cDNA gene sequences were patent-eligible subject matter.¹⁵⁶ He reasoned that the breaking of

¹⁵¹ See Utility Examination Guidelines, 66 Fed. Reg. 1092, 1093 (Jan. 5, 2001). In fact, since the 1980s the PTO has issued over 2,600 gene patents claiming “isolated DNA” and over 40,000 DNA related patents. *Ass’n for Molecular Pathology v. USPTO*, 653 F.3d 1329, 1333 (2011). In her concurring opinion, Judge Kimberly Moore also cited Federal Circuit cases that affirmed the “chemical compound” view of isolated DNA, such as *Amgen, Inc. v. Chugai Pharm. Co.*, which affirmed the validity for a patent claiming “a purified and isolated DNA sequence consisting essentially of a DNA sequence encoding human erythropoietin.” *Id.* at 1344 (quoting *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1203–04 (Fed. Cir. 1991),

¹⁵² See Utility Examination Guidelines, 66 Fed. Reg. at 1096.

¹⁵³ The genes as information view was espoused by the lower court and Judge Bryson in his Federal Circuit dissent in part. For an article discussing the opposing scientific and legal scholarly views of genes as information v. chemical compounds, see Allen K. Yu, *Within Subject Matter Eligibility, a Disease and a Cure*, 84 S. CAL. L. REV. 387, 410 (2011).

¹⁵⁴ See *Ass’n for Molecular Pathology*, 689 F.3d at 1332 (majority notes that the “decision that isolated DNA molecules are patent eligible comports with the longstanding practice of the PTO”).

¹⁵⁵ The case is referred to as the “Myriad” case since the exclusive licensee of the patent was Myriad Genetics, who ultimately was the respondent when the petition for certiorari was filed with the Supreme Court.

¹⁵⁶ *Id.* at 1328. The Federal Circuit applying *Bilski v. Kappos*, reversed the lower court on the method claims in *Myriad*, finding that all but one was patentable. Invalidity was

chemical bonds during the isolation process produces genetic material that constitutes a “distinct chemical entity” which is markedly different from the original product of nature.¹⁵⁷ Because isolated genes and gene sequences are markedly different from their naturally-occurring counterparts (they are smaller and chemically-altered), they qualify as patent-eligible subject matter under *Diamond v. Chakrabarty*.¹⁵⁸

upheld only for claims directed to comparing or analyzing DNA sequences, because they included no transformative steps and covered only ineligible abstract, mental steps. *See id.* at 1334.

¹⁵⁷ *See id.* at 1329 (“Thus, when cleaved, an isolated DNA molecule is not a purified form of a natural material, but a distinct chemical entity.”).

¹⁵⁸ More specifically, Judge Lourie opined that “[i]solated DNA has been cleaved (*i.e.*, had covalent bonds in its backbone chemically severed) or synthesized to consist of just a fraction of the naturally occurring DNA molecule.” *Id.* at 1328. As such, this cleaving and synthesizing “[imparts] on that isolated DNA a distinctive chemical identity as compared to native DNA.” *Id.*

Judge Kimberly Moore’s concurrence further distinguishes that the isolated cDNA falls into a separate category since cDNA, although based on a naturally occurring RNA template, is totally human engineered and has no naturally occurring counterpart. *Id.* at 1340–41 (Moore, J., concurring in part). “The claimed isolated cDNA sequences are the creation of man, made using biological tools and the naturally occurring mRNA as a template.” *Id.* at 1341 (Moore, J., concurring in part).

For a recent article agreeing with Judges Lourie and Moore but putting a slightly different spin on the *Chakrabarty* rule, see Janice M. Mueller, *Facilitating Patient Access to Patent-Protected Genetic Testing*, 6 J. BUS. & TECH. L. 83 (2011). In a thought-provoking piece, Professor Mueller disagrees with the *Myriad* district court and argues that the *Chakrabarty* rule does not focus on the “marked difference” between the natural product and the isolated, purified product, but instead simply requires that the isolated product is the subject of human intervention or manipulation. *Id.* at 88. I find this rationale problematic since the Court used the specific term “marked differences” in its holding. In fact, crucial to the *Chakrabarty* court’s reasoning was the fact that Dr. Chakrabarty’s bacteria could digest crude oil, a feature lacking in its naturally occurring counterpart. This distinction is what aligns *Chakrabarty* with *Funk Brothers*. In *Funk Brothers*, although the patentee manipulated and mixed several species of non-inhibitive root-nodule bacteria, the end-product was patent-ineligible subject matter since the human intervention did not result in a product that was biologically different from its naturally occurring counterpart. Prof. Mueller argues that there is no need to align *Chakrabarty* and *Funk Brothers* since *Chakrabarty* was decided under Section 101’s subject matter requirements and *Funk Brothers* decided on obviousness grounds. Although the *Funk Brothers* court uses the language “lacks inventiveness,” its core holding refers to the root-nodule material as “no more than . . . the handiwork of nature and hence is not patentable.” *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 131 (1948). I would therefore suggest that at best, the *Kalo* patents were invalidated on both subject matter, *id.* at 131, and obviousness grounds, *id.* at 442–43. I posit that it is the subject matter rejection that parallels *Chakrabarty*. *Myriad* argues that isolated DNA

As part of the Myriad opinion, Judge Lourie conceded that biologists may legitimately take the contrary view that since the basic isolated BRCA 1/2 genes have the same nucleotide sequence as their “native counterparts” (and must have them to carry out the invention’s utility of detecting genetic mutations linked to certain breast and ovarian cancers), they are not markedly different and thus are patent-ineligible products of nature under Section 101.¹⁵⁹ Yet, Judge Lourie maintained the incentive-based argument that the court must give great weight to the PTO’s long-standing position since 2001 that isolated DNA molecules are patent-eligible.¹⁶⁰ Judge Kimberly Moore, in her concurring opinion, agreed with Judge Lourie and reinforced the innovation-focused nature of the court’s conclusion.¹⁶¹ She reasoned that biotechnology companies have relied on these guidelines to develop a significant genomic portfolio and that patent protection for genomic material is crucial for continued innovation and economic growth of the biotechnology industry.¹⁶²

What is conspicuously absent from the Federal Circuit’s analysis is any constitutional vetting of which view best promotes progress, the “chemical compound” or “biological information” patentability analysis. In April, the Supreme Court remanded the Myriad case to the Federal Circuit for reconsideration in light of its opinion in *Mayo v. Prometheus*.¹⁶³ In *Mayo*, the Court held that access to basic research tools must be considered when evaluating Section 101 subject-matter eligibility. In addition, the Court held that Section 101’s bright-line test is applicable to all processes involving laws of nature, even when the law of nature is novel.

is “markedly different” because it can be used in diagnostic tests or gene therapy, *see Ass’n for Molecular Pathology v. USPTO*, 702 F. Supp. 2d 181, 230 (S.D.N.Y. 2010), *aff’d in part, rev’d in part*, 653 F.3d 1329 (Fed. Cir. 2011), *cert. granted*, 132 S. Ct. 1794 (U.S. Mar. 26, 2012) (No. 11-725), but this property is simply incident to the DNA being *ex vivo*. The utility of the DNA lies in its naturally-occurring capability to encode specific information.

¹⁵⁹ *Ass’n for Molecular Pathology*, 689 F.3d at 1330.

¹⁶⁰ *See id.* at 1330–31.

¹⁶¹ *See id.* at 1347.

¹⁶² *Id.*

¹⁶³ In *Mayo*, the court found that the process for correlating thiopurine metabolites with dosage effectiveness and related harms from the thiopurine drug constituted patent-ineligible subject matter.

Unfortunately, the Federal Circuit refused to back away from its incentive-centered arguments and reaffirmed its opinion that isolated BRCA 1/2 genes are patentable subject-matter.¹⁶⁴ There is only one substantive difference between the first and second Federal Circuit opinions. In the opinion after remand, the Federal Circuit was forced to distinguish Myriad from *Mayo* to avoid being bound by this Supreme Court precedent.¹⁶⁵ Judge Lourie achieved this by arguing that unlike the correlating process in *Mayo*, “permitting patents on isolated genes does not preempt a law of nature.”¹⁶⁶ He reasoned that isolated genes as compositions of matter are more properly viewed as products of man, which often follow a law of nature, but are not properly placed in the law of nature exclusion evaluated by the Supreme Court in *Mayo*.¹⁶⁷ Interestingly, Judge Bryson in his dissent draws the more reasonable and proper analogy to *Mayo*: “Just as a patent involving a law of nature must have an ‘inventive concept’ that does ‘significantly more than simply describe . . . natural relations,’ a patent involving a product of nature should have an inventive concept that involves more than merely incidental changes to the naturally occurring product.”¹⁶⁸

Arguably, the Federal Circuit’s artificial distinction of *Mayo* was central to sustaining the incentive-centered narrative. Indeed, Judge Moore, in her concurrence after remand, expressly adopted an incentive-focused view of how patents promote progress as part of her argument to stay the course and follow the PTO Guidelines that isolated genes, such as BRCA 1/2, are patentable.¹⁶⁹ She uses a quote from the Supreme Court’s earlier *Festo* opinion when stating that:

The settled expectation of the biotechnology industry—not to mention thousands of issued patents—cannot be taken lightly and deserve

¹⁶⁴ *Id.* at 1333.

¹⁶⁵ *Id.* at 1331.

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ *Id.* at 1355 (Bryson, J., concurring in part and dissenting in part) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294–97 (2012)).

¹⁶⁹ *See id.* at 1343–47 (Moore, J., concurring).

deference. This outpouring of scientific creativity, spurred by the patent system, reflects a substantial investment of time and money by the biotechnology industry to obtain property rights to DNA sequences. The type of fundamental alteration in the scope of patentable subject matter argued in this case ‘risk[s] destroying the legitimate expectations of inventors in their property.’¹⁷⁰

I suggest that the Federal Circuit’s refusal to give the proper deference to the Supreme Court upon remand, and its failure to balance the potential harms to progress caused by patenting basic research tools such as isolated genes, is a prime illustration of the Court’s conservative *pragmatic acceptance* of the status quo.¹⁷¹ This course can only be corrected by moving toward a more balanced “postmodern” view of progress.

III. MOVING TOWARD A MORE BALANCED “POSTMODERN” VIEW OF PROGRESS

The condition of post-modernity is distinguished by an evaporating of the ‘grand narrative’—the overarching story-line by means of which we are placed in history as beings having a definite past and a predictable future. The post-modern outlook sees a plurality of heterogeneous claims to knowledge, in which science does not have a privileged place.¹⁷²

¹⁷⁰ *Id.* at 1344 (quoting *Festo Corp. v. Shakes Kinzoku Kogyo Kabushiki Col.*, 535 U.S. 722, 739 (2002)).

¹⁷¹ See *Ass’n for Molecular Pathology*, 689 F. 3d at 1348–58 (Bryon, J., concurring in part and dissenting in part); see also Dinwoodie & Dreyfuss, *supra* note 131 (emphasizing access to scientific knowledge as integral to progress); GIDDENS, *supra* note 14, at 134–36 (outlining his theory on “pragmatic acceptance”); Menell, *supra* note 121, at 1300–01.

¹⁷² See GIDDENS, *supra* note 14, at 2 (1990).

Postmodern “Progress,” therefore necessarily changes the relatively undifferentiated incentive or monopoly framework that characterizes current intellectual property [patent] case law¹⁷³ An idea of progress that rejects sheer material growth as its sine qua non changes the focus of our intellectual property laws from competition policy to the complicated interface between science and society.¹⁷⁴

A. *Intellectual Property and Postmodern Progress*

Despite the frequent assertion that the United States has been a “postmodern” society since the 1960’s,¹⁷⁵ Giddens counters that we are really in the transition mode of “radicalized modernity,” where we are questioning the status quo.¹⁷⁶ As radicalized modernists, we begin to see the weaknesses in each dimension of modernity. We then evaluate our past and current behavior in each dimension against current concerns such as humanism, world peace and sustainability. For Giddens, we will not become a true postmodern society until we affirmatively deconstruct the current modernist dimensions of surveillance and control, industrialism, capitalism and military power and replace them with the new “contours” or dimensions of: 1) post-scarcity, rather than having a “market-based” economy, there is a more equitable distribution of wealth and resources (Under this paradigm, quality of life and values are no longer centered on status and economic growth and ultimately “scarcity” no longer exists for certain economically-disadvantaged classes or groups. Giddens concedes that this is more easily achieved in the “more affluent areas of the world.”);¹⁷⁷ 2) multi-layered democratic participation; 3) demilitarization; and

¹⁷³ See Chon, *supra* note 19, at 125–26.

¹⁷⁴ *Id.* at 145

¹⁷⁵ GIDDENS, *supra* note 14, at 55–78; see also Sim, ed., *supra* note 14, at x; Smart, 59 note 60, at 12.

¹⁷⁶ GIDDENS, *supra* note 14, at 149–50.

¹⁷⁷ *Id.* at 165–67.

4) a humanization of technology.¹⁷⁸ To ultimately achieve this “utopian” postmodernism, we must continue to radically engage and challenge current legal and social constructs in light of the past and future in order to determine which changes best effectuate a better balance that helps negate the risks and harms created by modernism.¹⁷⁹

Margaret Chon, in her seminal article, “Postmodern Progress: Reconsidering the Copyright and Patent Power,”¹⁸⁰ places this discussion in an intellectual property context and advocates adopting a “postmodern” view of progress which would allow us to evaluate Congress’s copyright and patent power “against a complex context of disparities in control over knowledge rather than simply against the provision of incentives to inventors.”¹⁸¹ Like Giddens, Chon describes modern progress as forward-moving, with an eye toward economic and cultural growth, while postmodernism “deconstructs the linear and forward nature of ‘Progress,’”¹⁸² and sometimes limits intellectual property rights if limitations necessary to promote a sustainable ecosystem or provide access to basic research.¹⁸³ Without using sociological terms such as “radical engagement” and “radicalized modernism,” Chon argues that our modern incentive-driven views concerning

¹⁷⁸ *Id.* at 163–65.

¹⁷⁹ *Id.* at 177–78.

¹⁸⁰ See Chon, *supra* note 19.

¹⁸¹ *Id.* at 133 (outlining the Framers’ and Americans’ awareness that they were economically and culturally behind European nations and therefore believed that regulating information and invention would contribute to improvement of America’s socioeconomic and cultural status).

¹⁸² *Id.* at 101

¹⁸³ *Id.*; see also *id.* at 125.

Yet, importantly, a postmodern “Progress” is not defined simply by the eschewal of the grand story line of modern progress. “Postmodern” progress is progress that is consistent with the “bottom-up” approach of postmodernism, one that recognizes that “progress”ive acts may be backward as well as forward, perhaps sideways, and most often circular (as exemplified by the accelerated reflexivity of knowledge).

Id. at 125 (quoting PAULINE M. ROSENAU, POST-MODERNISM AND THE SOCIAL SCIENCES: INSIGHTS, INROADS, AND INTRUSIONS 25 (1st ed. 1992); see also Chon, *supra* note 19, at 98 n.3 (“We are abroad in a world which is thoroughly constituted through reflexively applied knowledge, but where at the same time we can never be sure that any given element of that knowledge will not be revised.”); GIDDENS, *supra* note 14, at 39.

intellectual property have prevented courts and Congress from taking on the “Progress Project”—stepping back and carefully reflecting on whether progress in the constitutional context means more than simply incentivizing the production of knowledge to achieve economic/industrial growth.¹⁸⁴ In other words, did the Framers actually have a broader “postmodern” view of progress than the current incentive-centered paradigm would suggest, a view in which access to knowledge was at least as significant as, and possibly more significant than, incentivizing the production of knowledge?¹⁸⁵

Chon boldly posits that the constitutionally sound view of promoting progress treats the goal of maintaining access to knowledge as a more fundamental constitutional mandate than the incentivizing of the creation of Science and the useful Arts.¹⁸⁶ This broad and more balanced vision of progress requires courts to replace the incentive-centered discussion with one that gives more credibility to access issues. She discusses the computer software cases of *Computer Associates v. Altai* and *When Associates v. Jaslow Dental Laboratory* as illustrative of the Supreme Court’s “lack of vision with respect to this larger Progress project.”¹⁸⁷

In establishing why a balanced view of progress is more constitutionally sound, Chon notes the Framers’ original vision of promoting “[l]ife, [l]iberty, and [t]he [p]ursuit of happiness” as the basis of a modernist social construct wherein enlightened citizens could build a strong nation-state utilizing the principles of democracy, capitalism and industrialism and economic growth. Central to this modernist construct was improving our socioeconomic and cultural status to be on par with that of European nations.¹⁸⁸ The constitutional mandate of the IP clause

¹⁸⁴ See Chon, *supra* note 19, at 117 (arguing that this is the essence of the 18th Century Enlightenment Project. “This utopian [modernist] faith in progress produced an optimism that knowledge will surely yield good results rather than bad, and improvements rather than regressions.”).

¹⁸⁵ See *id.* at 134–35.

¹⁸⁶ See *id.* at 104 (“[T]extual evidence suggests that the incentives provided by copyrights and patent are only second-order concerns which serve a higher purpose—the “Progress” project—which preserves and nurtures a commons of knowledge.”).

¹⁸⁷ *Id.* at 107–10.

¹⁸⁸ *Id.* at 119–21.

to develop a regulatory framework for patents and copyrights in order to promote “progress in Science and the useful Arts” was seen as aiding these modernist goals.

What courts and many scholars overlook, according to Chon, is that the writings of Thomas Jefferson and James Madison reflect an equally strong desire that this clause not only incentivize the creation of knowledge but preserve a “right of access” to this knowledge.¹⁸⁹ She carefully walks us through the Federalist papers and establishes that although Madison was a vocal advocate of a federal intellectual property scheme, he realized that there must be a “public good” or “access to knowledge” included within this property right.¹⁹⁰ Chon points us to Federalist Paper No. 43, where Madison states with respect to the patent and copyright clause (IP clause) that “the public good fully coincides with the claims of individuals.”¹⁹¹ Jefferson was even more adamant than Madison about preserving free access to knowledge and went so far as to propose an award system for authors and inventors, rather than one granting federal intellectual property rights.¹⁹² Indeed, in a letter to Madison during the drafting of the Constitution, Jefferson indicates that he would have left the IP clause out of the Constitution.¹⁹³

Other commentators join Chon in inferring that Jefferson’s agreement to support the IP clause was a compromise premised on the clause’s inclusion of the dual limitations of only providing rights that “promoted progress” and proving these rights for “limited times.”¹⁹⁴ Unlike Chon, however, these commentators cite the Framers’ views and the ultimate compromise to supplement their textual and structural arguments that the Progress

¹⁸⁹ See *id.* at 104; see also *id.* at 134–43 (outlining how the works of Jefferson and Madison compare).

¹⁹⁰ See *id.* at 135–36.

¹⁹¹ See *id.* at 137 (quoting James Madison, Federalist Paper No. 43).

¹⁹² See *id.* at 140–44; Chon posits that one might infer from Jefferson’s reluctance, “the notion that he valued the freedom to acquire knowledge” as more prominent property right than providing a right to exclude. *Id.* at 143.

¹⁹³ See e.g. Olliar, *supra* note 3, at 1786, citing Letter from Thomas Jefferson to James Madison (July 31st, 1788), in 1 THE FOUNDERS’ CONSTITUTION 476 (Phillip B. Kurland & Ralph Lerner eds., 1987).

¹⁹⁴ See e.g., Olliar, *supra* note 3, at 1777.

portion of the IP clause expressly limits Congress's intellectual property power.¹⁹⁵ Chon takes this premise one step further and advocates that "promoting progress" goes beyond incentivizing authors and inventors to increase knowledge, and includes the fundamental right of each human to access that knowledge.¹⁹⁶

Placing Chon's arguments in the Giddens framework, her thesis urges courts and Congress to become radicalized modernists and challenge whether patent law currently promotes a balanced and constitutionally sound view of progress. To do this, courts must replace the incentive-centered narrative, which broadly draws patent boundaries since patents per se promote progress, with a narrative that considers "access to knowledge" when drawing the boundaries surrounding this right. I posit that in *Mayo v. Prometheus*, the Supreme Court begins to embrace the vision of the Progress Project by acknowledging access to basic "building-block" research as a fundamental right which sometimes supersedes the presumptive power of patents to incentivize research.¹⁹⁷

B. *Mayo Collaborative Servs. Inc. v. Prometheus Labs., Inc.*¹⁹⁸:

The Supreme Court takes a step towards postmodern progress by restoring balance to Section 101's subject-matter eligibility requirements

Justice Breyer, writing for the dissent in the *Metabolite* case,¹⁹⁹ opined that it was a mistake for the Supreme Court to dismiss its earlier writ of certiorari simply because the petitioners failed to refer to the Section 101 subject-matter eligibility issue in its lower court claims.²⁰⁰ He argued that clarifying the law in this area "sooner rather than later" would work to the public's benefit,

¹⁹⁵ See Fromer, *supra* note 9, at 1349–50; Oliar, *supra* note 3, at 1781–84.

¹⁹⁶ See Chon, *supra* note 19, at 144.

¹⁹⁷ *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1303 (2012) ("And so the cases have endorsed a bright-line prohibition against patenting laws of nature, mathematical formulas and the like, which serves as a somewhat more easily administered proxy for the underlying 'building-block' concern.").

¹⁹⁸ *Id.*

¹⁹⁹ See generally *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124 (2006).

²⁰⁰ *Id.* at 132–33 (Breyer, J., dissenting).

particularly since it was already briefed and argued by the parties.²⁰¹ Like a voice in the wilderness, he ended by admonishing the Court that it “could contribute to the important ongoing debate, among both specialists and generalists, as to whether the patent system, as currently administered and enforced, adequately reflects the ‘careful balance’ that ‘the federal patent laws . . . embod[y].’”²⁰² Unfortunately, it took several years and an appeal after remand before the Court returned to this debate and restored balance to Section 101’s subject-matter eligibility requirements.

In *Mayo Collaborative Services Inc. v. Prometheus Laboratories, Inc.*,²⁰³ Prometheus Labs patented a process measuring the relationship between metabolite levels in the blood and the likelihood that a particular dosage of thiopurine²⁰⁴ is either effective or harmful. Mayo Collaborative Services, a licensee of the Prometheus patent, eventually developed its own improved process for correlating thiopurine metabolite levels with the drug’s efficacy.²⁰⁵ Prometheus sued Mayo for patent infringement and Mayo counterclaimed that the patent was invalid since it constituted patent-ineligible subject matter under Section 101 of the Patent Act.²⁰⁶ The District court held that the patent was an unpatentable product of nature since the additional steps were well known.²⁰⁷ On appeal, the Federal Circuit reversed the District court, holding that the additional steps transformed the product of nature into patent-eligible subject matter under the court’s

²⁰¹ *Id.* at 134 (Breyer, J., dissenting).

²⁰² *Id.* at 138 (quoting *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 146 (1989)).

²⁰³ *See generally* *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

²⁰⁴ Thiopurine is a drug used to treat a range of intestinal disorders such as Irritable Bowel Syndrome (IBS). *See id.* at 1350.

²⁰⁵ *Id.* at 1290.

²⁰⁶ *See id.* at 1295–97.

²⁰⁷ *Prometheus Labs., Inc. v. Mayo Collaborative Servs*, CIV. 04CV1200JAHRBB, 2008 WL 878910 at *14 (S.D. Cal. Mar. 28, 2008) *rev’d*, 581 F.3d 1336 (Fed. Cir. 2009) *cert. granted, judgment vacated*, 130 S. Ct. 3543 (2010), *rev’d*, 628 F.3d 1347 (Fed. Cir. 2010), *rev’d*, 132 S. Ct. 1289 (2012).

“machine or transformation” test.²⁰⁸ Mayo then filed its first writ of certiorari, which resulted in the Supreme Court remanding the case to the Federal Circuit for reconsideration in light of its decision in *Bilski v. Kappos*,²⁰⁹ which limited the machine-or-transformation test to a clue, rather than the sole test case for determining whether a process constitutes Section 101 patent eligible subject matter.²¹⁰ On remand, the Federal Circuit reaffirmed its holding by stating that even using the machine-or-transformation test as a clue-the process claims “do not encompass laws of nature or preempt natural correlations”²¹¹ and are patent-eligible, since “they [the claims] transform the human body by administering a thiopurine drug and transform the blood by analyzing it to determine metabolite levels.”²¹² Mayo then filed a second writ for certiorari which was granted by the Supreme Court.²¹³

Justice Breyer, writing for a unanimous majority, reversed the Federal Circuit and held that the process was patent-ineligible subject matter since the additional steps fail to “transform[] the unpatentable natural laws into patent-eligible applications of those laws.”²¹⁴ I argue that the Supreme Court’s analysis and response

²⁰⁸ *Prometheus Labs., Inc. v. Mayo Collaborative Servs.*, 581 F.3d 1336, 1345 (Fed. Cir. 2009), *cert. granted, judgment vacated*, 130 S. Ct. 3543 (2010).

²⁰⁹ *See generally* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

²¹⁰ *Id.* at 3226–27.

²¹¹ *Prometheus Labs., Inc. v. Mayo Collaborative Servs.*, 628 F.3d 1347, 1355 (Fed. Cir. 2010), *rev’d*, 132 S. Ct. 1289 (2012).

²¹² *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1302 (2012). The Federal Circuit analogized the Prometheus process to the process in *Diamond v. Diehr*, 450 U.S. 175, 187–88 (1981), where the court held that the process (software based) for molding uncured rubber using the Arrhenius equation was patent eligible since it included significant post-solution activity in addition to the basic mathematical algorithm, thus transforming the algorithm based process into patent eligible subject matter.

²¹³ *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 131 S. Ct. 3027, 180 L. Ed. 2d 844 (2011).

²¹⁴ *Mayo*, 132 S. Ct. at 1294.

Claim 1, for example, states that *if* the levels of 6-TG in the blood (of a patient who has taken a dose of a thiopurine drug) exceed about 400 pmol per 8x10 red blood cells, *then* the administered dose is likely to produce toxic side effects. While a human action (the administration of the thiopurine drug) to trigger a manifestation of this relation in a particular person, the relation itself exists in principle apart from any

to counter-arguments demonstrate a radicalized modernist approach where the court radically engages the incentive-centered paradigm and restores balance to evaluating patentability under Section 101.

The Court begins the *Mayo* opinion using the traditional tools: reciting the plain language of Section 101, then evaluating key precedents that establish the common law basis for excluding laws of nature, natural phenomena and abstract ideas since they are the building blocks for scientific and technological work.²¹⁵ The Court acknowledges that its own precedent cautions against an overly broad interpretation of the common law exclusion, since on some level, every invention is based on a law of nature, natural phenomena or abstract idea.²¹⁶ For a process centered around a law of nature to become patentable, however, it must include enough additional steps to create an “‘inventive concept’ sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself.”²¹⁷ Steps that amount to no more than insignificant post-solution activity cannot be used to circumvent the law of nature exclusion.²¹⁸

The law of nature raised in the Prometheus claims was the relationship between concentrations of certain metabolites in the blood and the likelihood that a particular drug dosage would either be ineffective or cause harm.²¹⁹ The Court breaks into three categories the additional steps that went beyond reciting the

human action. The relation is a consequence of the ways in which thiopurine compounds are metabolized by the body—entirely natural processes. And so a patent that simply describes that relation sets forth a natural law.

Id. at 1296–97.

²¹⁵ *Id.* at 1293–94 (citing *Bilski v. Kappos*, 130 S. Ct. 3218, 3233–34 (2010); *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); *Diehr*, 450 U.S. at 185; *Le Roy v. Tatham*, 14 How. 156, 175, 14 L.Ed. 367 (1853); *O’Reily v. Morse*, 15 How. 62, 112–120, 14 L.Ed. 601 (1854); *cf.* *Neilson v. Harford*, *Webster’s Patent Cases* 295, 371 (1841)).

²¹⁶ *Mayo*, 132 S. Ct. at 1293.

²¹⁷ *Id.* at 1294 (quoting *Parker v. Flook*, 437 U.S. 594, 598 (1978)).

²¹⁸ *Mayo*, 132 S. Ct. at 1294 (citing *Bilski*, 130 S. Ct. at 3218).

²¹⁹ *See Mayo*, 132 S. Ct. at 1296–97 (reciting the law of nature portion of claim 1: “[I]f the levels of 6-TG in the blood (of a patient who has taken a dose of a thiopurine drug) exceed about 400 pmol per 8x10 red blood cells, *then* the administered dose is likely to produce toxic side effects.”).

excluded law of nature: 1) the administering steps, 2) the wherein steps and 3) the determining steps.²²⁰ The Court outlines the basic arguments for why each step as well as the combination fail to transform the law of nature into patent-eligible subject matter. First, the administering step did no more than identify the relevant audience of doctors treating auto-immune diseases, which is well known.²²¹ Second, the determining step failed to transform the process since instructing doctors or lab technicians to measure the thiopurine metabolite level was obvious and already carried out for some time in the field before the patent was issued.²²² Third, the wherein clause did no more than contextualize the relevant natural laws and suggest its significance in treating patients.²²³ Last but not least, even the combination of the three additional steps failed to transform the Prometheus law of nature since it “add[ed] nothing to the laws of nature that is not already present when the laws are considered separately.”²²⁴

Justice Breyer then proceeded with a detailed Section 101 analysis based on the controlling precedents of *Diehr* and *Flook*.²²⁵ He artfully switched between the cases to illustrate how the patentability of claim 1 of the Prometheus patent is weaker than *Diehr* (where the additional steps of installing rubber in a press, closing the mold, constantly determining the molds temperature, recalculating the cure time using the law of nature and a digital computer were not conventional, obvious or convention, so could qualify as significant post-solution activity) and no stronger than *Flook* (where the additional steps failed to transform the unpatentable formula for computing an updated alarm limit never provided details such as how to select the formula variables and discussion of various chemical processes involved in the catalytic conversion of hydrocarbons were all well-known and lacked an

²²⁰ *Id.* at 1297–98.

²²¹ *Id.* at 1297.

²²² *Id.* at 1297.

²²³ *Id.* at 1297–98 (citing *Parker v. Flook*, 437 U.S. 594, 590 (1978), for support that “purely conventional or obvious pre-solution activity is normally not sufficient to transform an unpatentable law of nature into a patent-eligible application of such a law”) (internal quotation marks omitted).

²²⁴ *Mayo*, 132 S. Ct. at 1291 (quoting *Diamond v. Diehr*, 450 U.S. 175, 188 (1981))

²²⁵ *Id.* at 1292, 1298–1300

inventive concept).²²⁶ He used the British case of *Neilson* as support for the proposition that adding a series of broad conventional steps without inventive aspects cannot elevate a law of nature into patent-eligible subject matter; and he used *Bilski* and *Benson* as support for the view that limiting the process to one particular field, such as treating intestinal focused autoimmune disorders, is not enough to transform steps relating to a law of nature into patent-eligible subject matter. (*Bilski*'s claims expressly limited use of the hedging formula to the commodities and energy markets, and *Benson*'s binary conversion process was limited to the then-new area of digital computers.)²²⁷

The *Mayo* opinion starts to radically engage the status quo when it takes more than one or two sentences to discuss why the policy of excluding laws of nature, natural phenomena and abstract ideas from qualifying as patent-eligible subject matter must extend to newly discovered and innovative laws of nature, such as the specific correlations between thiopurine metabolite levels and the dosages outlined in the Prometheus patents. In other words, we can no longer begin and end the discussion with the argument that patents per se promote progress, so innovative processes must be broadly evaluated under Section 101.²²⁸ The opinion begins by noting that the Supreme Court in *Benson*, *Flook* and *Bilski* articulated concerns that the patenting of such processes, no matter how novel, would inhibit future innovation both within and outside of the particular field.²²⁹

As part of its discussion, the Court conceded that while rewarding patents for new processes centered around a law of nature might in fact incentivize additional discoveries, there remains the problem that society needs access to such laws and

²²⁶ *Id.* at 1292.

²²⁷ *Id.* at 1300–02.

²²⁸ *See generally id.*

²²⁹ *Id.* at 1301; *see also* *Gottschalk v. Benson*, 93 S. Ct. 253, 255 (1972) (noting that the claims were “so abstract and sweeping as to cover both known and unknown uses of the [mathematical formula]”); *Bilski v. Kappos*, 130 S. Ct. 3218, 3231 (2010) (pointing out that to allow “petitioners to patent risk hedging would pre-empt use of this approach in all fields”); *Parker v. Flook*, 437 U.S. 584, 586 (1978) (expressing concern that the claimed process was simply “a formula for computing an updated alarm limit,” which might “cover a broad range of potential uses”).

principles since they are the “basic tools of scientific and technological work.”²³⁰ More specifically, the court cautions that this danger is particularly acute when the “patented process amounts to no more than an instruction to ‘apply a natural law,’ or otherwise forecloses more future invention than the underlying discovery could reasonably justify.”²³¹ Unwilling to rely on judicial precedent alone, the Court then cited numerous scholarly articles that support this position and explain, for example, that “exclusion from patent law of basic truths reflects ‘both . . . the enormous potential for rent seeking that would be created if property rights could be obtained in them and . . . the enormous transaction costs that would be imposed on would-be users [of those truths].’”²³²

The argument remained that the narrow and specific nature of the Prometheus claims would limit their ability to significantly interfere with future innovation, so even a single step beyond the basic law should be enough to cross over into Section 101 patentable subject matter.²³³ Justice Breyer countered by pointing out that that even narrowly drawn laws of nature can inhibit progress, and that courts are ill-equipped to distinguish among different laws of nature.²³⁴ Thus, the better view is for courts to apply the “bright-line prohibition against patenting laws of nature” which serves as an adequate and user-friendly proxy for “the underlying ‘building-block’ concern[s].”²³⁵

Next, the Court addressed the Government’s arguments that the Section 102 (novelty), 103 (nonobviousness) and 112 (written description/enablement) requirements perform adequate screening

²³⁰ *Mayo*, 132 S. Ct at 1301 (citing *Benson*, 93 S. Ct at 67).

²³¹ *Mayo*, 132 S. Ct. at 1301 (“One problem with [process] patents is that the more abstractly their claims are stated, the more difficult it is to determine precisely what they cover. They risk being applied to a wide range of situations that were not anticipated by the patentee.”). *Id.* at 1302 (quoting C. BOHANNAN & H. HOVENKAMP, CREATION WITHOUT RESTRAINT: PROMOTING LIBERTY AND RIVALRY IN INNOVATION, 12 (2012)). See generally Lemley, Risch, Sichelman, & Wagner, *Life After Bilski*, 63 STAN. L. REV. 1315 (2011) (arguing that § 101 reflects this kind of concern).

²³² *Mayo*, 132 S. Ct., at 1302 (citing W. Landes & R. Posner, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 305–06 (2003)).

²³³ *Mayo*, 132 S. Ct. at 1303.

²³⁴ *Id.*

²³⁵ *Id.*

functions for patentability, without the need for a separate Section 101 subject matter analysis.²³⁶ Adopting this view, according to Justice Breyer, would “make the ‘law of nature’ exception to Section 101 patentability a dead letter.”²³⁷ He further reasons Sections 102, 103 and 112 each have their own clearly articulated screening function, which does not evaluate the “kind of risk that underlies the law of nature exception, namely the risk that a patent on the law would significantly impede future innovation.”²³⁸ Even in those instances where there appears to be an overlap between the Section 102 novelty and Section 101 patent-eligibility inquiry, it is not enough to allow Section 102 to serve as a proxy for Section 101 since this would create “significantly greater legal uncertainty, while assuming that those sections [102, 103 and 112] can do work that they are not equipped to do.”²³⁹

Justice Breyer further noted that nothing in the plain language of Sections 102, 103 or 112 supports allowing them to serve as proxies for Section 101, and that to allow these requirements to do so would “create the kind of risk that underlies the law of nature exception, namely the risk that a patent on the law would significantly impede future innovation.”²⁴⁰ Justice Breyer concluded by expressly holding that “[t]hese considerations lead us to decline the Government’s invitation to substitute Sections 102, 103 and 112 inquiries for the better established inquiry under Section 101.”²⁴¹ This holding demonstrates the Court’s willingness to *radically engage* the status quo, to draw the correct

²³⁶ *Id.* at 1303–04.

²³⁷ *Id.* at 1303.

²³⁸ *Id.* at 1304 (stating that “[t]he Government, however, suggests in effect that the novelty of a component law of nature may be disregarded when evaluating the novelty of the whole. . . . But §§ 102 and 103 say nothing about treating laws of nature as if they were part of the prior art when applying those sections.”). As to Sections 102 and 103, Breyer notes that “studiously ignoring *all* laws of nature when evaluating a patent application under §§ 102 and 103 would ‘make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which once known, make their implementations obvious.’” *Id.* at 1304 (citing *Diamond v. Diehr*, 450 U.S. 175, 189. n.12. (1981)).

²³⁹ *Mayo*, 132 S. Ct. at 1304.

²⁴⁰ *Id.*; see also Risch, *Everything is Patentable*, 75 TENN. L. REV. 591 (2008) (defending a minimalist approach to Section 101).

²⁴¹ *Id.*

patentability boundaries and to restore the significance of Section 101 as the threshold test for patentability. Furthermore, implied in an analysis that takes into account statutory language, incentivizing research and access issues is a more balanced view of progress—one where Section 101’s law of nature exclusion is carefully evaluated to ensure access to basic research.²⁴² This reflects one giant step toward Chon’s postmodern “Progress Project,” where the access right becomes as fundamental to promoting progress as incentivizing new and useful natural laws.²⁴³

Further, the *Mayo* opinion concludes with Justice Breyer revisiting the conflicting views concerning whether denying patentability will interfere significantly with diagnostic research²⁴⁴ or prevent the creation of patent thickets so that “critical scientific data that must remain widely available” for future discoveries is indeed made available.²⁴⁵ He acknowledges that patent law has the difficult task of balancing these competing interests across the “many different fields of human endeavor.”²⁴⁶ Yet, Justice Breyer concludes that it is better to stick with the “established general rules” because a special rule to promote innovation for one industry may produce “unforeseen results” or problems for another.²⁴⁷ Breyer takes the last radicalized modernist or “Progress Project” step by recognizing that it is well within Congress’s role to create *sui generis* legislation or “more finely tailored rules where necessary” to promote progress.²⁴⁸

The only instance where Justice Breyer’s virtually flawless opinion falls short is that he fails to clearly articulate a connection between the constitutional limitation “to promote progress” and

²⁴² *Id.* at 1305.

²⁴³ *See* Chon, *supra* note 19, at 102–03; *see also Mayo*, 132 S. Ct. at 1302–04.

²⁴⁴ *Id.* at 1304–05 (noting that this is the fourth argument raised by Prometheus Labs).

²⁴⁵ *Id.* (citing Brief for American College of Medical Genetics et al. as Amici Curiae 7). The counter-argument of denying patentability to prevent patent thickets and promote research was made by various Amici Curiae such as the AMA, AHA, AAMC and Association for Medical Pathology. *Id.*

²⁴⁶ *Id.* at 1305.

²⁴⁷ *Id.*

²⁴⁸ *See id.* Because of this, Breyer ends the opinion by side-stepping the policy evaluation of whether *sui-generis* legislation or “increased protection for discoveries of diagnostic laws of nature is desirable.” *Id.*

how the limitation necessitates the “bright-line” law of nature exclusion and restores balance to evaluating the law of nature exclusion and Section 101 as the threshold test for patentability.²⁴⁹ As noted by Menell, “[t]he proper interpretive path for patentable subject matter—from constitutional, jurisprudential, and pragmatic standpoints—requires courts to integrate the constitutional and jurisprudential traditions surrounding patentable subject matter with principles of statutory construction and forthright recognition of the challenges of applying historic doctrines to unforeseeable technological developments.”²⁵⁰ Nevertheless, for the first time, the Supreme Court does consider the impact of novel diagnostic tools on innovation and access, and also includes both plain language and jurisprudential analysis in its patentability evaluation. This is a vast improvement over *Bilski* and many Federal Circuit opinions. Moreover, despite the Court’s failure to specifically mention the IP clause and its progress limitation, a more balanced view of “promoting progress” is inherent in each of its arguments.

CONCLUSION

A radicalized modern view of patent law allows us to challenge the incentive-centered narrative of promoting progress and consider this narrative’s impact on future discoveries, humanism, morality and the environment. In *Mayo v. Prometheus*, the Supreme Court takes a step in the direction of postmodern progress by restoring a balanced view of subject-matter eligibility and leaving the door open for Congress to explore other paradigms for protecting certain patent-ineligible subject matter.

²⁴⁹ See Peter S. Menell, FORTY YEARS OF WONDERING IN THE WILDERNESS AND NO CLOSER TO THE PROMISE LAND: BILSKI’S SUPERFICIAL TEXTUALISM AND THE MISSED OPPORTUNITY TO RETURN PATENT LAW TO ITS TECHNOLOGY MOORING, 63 STAN. L. REV. 1289, 1307–08 (2011) (noting that “[b]y failing to explicate the framework for delineating the scope of patentable subject matter or its contours, the Court shirked its larger constitutional responsibility, thereby contributing to a pathological political dynamic that undermines the patent system”).

²⁵⁰ *Id.* at 1308.