Distinguishing Patent and Copyright Subject Matter

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In State Street Bank & Trust Co. v. Signature Financial Group, Inc.,¹ the U.S. Court of Appeals for the Federal Circuit rejected the long-accepted exclusion of "business methods" as patent subject matter.² Shortly thereafter, that same court held that physical transformation of material from one state to another was not a requirement for patentability.³ The test, rather, is whether an algorithm or process is "applied in a practical manner to produce a useful result."⁴ The scholarly commentary on these developments has ranged largely from highly critical to neutral.⁵

This Article argues that digital information technology has largely forced these developments in patent law. For one thing, information as such as well as useful and creative ways of organizing and processing information are increasingly the end products of industry. If patent is to be limited to physical artifacts and their manipulation by industrial processes, it is likely to become increasingly irrelevant as we move more and more to an information-as-product economy.⁶ Even more important, the already

¹ 149 F.3d 1368 (Fed. Cir. 1998).
² Id.
⁴ Id. at 1360.
⁵ See discussion infra notes 17-20 and accompanying text.
⁶ The Federal Circuit said much the same thing in AT&T: "Since the process of manipulation of numbers is a fundamental part of computer technology, we have had to reexamine the rules that govern the patentability of such technology." AT&T, 172 F.3d at 1355; see also Richard S. Gruner, Intangible Inventions: Patentable Subject Matter for an Information Age, 35 LOY. L.A. L. REV. 355, 360-61 (2002) (noting that "information-processing innovation is at the heart of many of the most important changes now underway in our individual, social, business, and governmental activities"); R. Carl Moy, Subjecting Rembrandt to the Rule of Law: Rule-Based Solutions for Determining the Patentability of Business Methods, 28 WM. MITCHELL L. REV. 1047, 1086 (2002) (retaining a requirement of physical transformation for method patents will make the patent system increasingly inapplicable to the information economy and will cause its replacement by other regimes of intellectual property protection).
much eroded distinction between patent and copyright subject matter would almost completely disappear for digital technologies, resulting in expanded copyright coverage of many works that are technological in nature. If patent is bad for any of these things, copyright’s long term and broad scope of protection make copyright almost surely worse. Yet, if patent protection is categorically denied on subject matter grounds, courts are likely to try to fill the apparent gap in protection with copyright. This Article thus concludes that accepting applied and useful, although non-physical, processes as patent subject matter is the only way to maintain the critical distinction from copyright subject matter and that we should look to the other requirements for patentability—such as objectively verifiable usefulness, novelty, and nonobviousness—for limiting any untoward effects.

I. INTRODUCTION

Patent and copyright have mutually coexisted for several hundred years. During this period, numerous sui generis statutes have been adopted (and many more have been proposed), designed to give protection to specific subject matters that arguably did not fit within either of the two major intellectual property paradigms. While these paradigms were thus

Moreover, tying patentable processes to physical transformation would require drawing increasingly artificial lines between these processes that involve transformations of the sort that will support patentability and those that do not.

7 On the sense in which the scope of copyright protection is broader than that of patent, see discussion infra note 40.

8 The period of coexistence depends on just when “patent” and “copyright,” as we now know them, are deemed to have come into existence. Most authors trace modern copyright back to the British Statute of Anne in 1710. Statute of Anne, 1710, 9 Ann., c. 19 (Eng.). Patents for inventions, or at least for bringing foreign industry and production methods into the realm, date from the middle of the sixteenth century. Adam Mossoff, Rethinking the Development of Patents: An Intellectual History, 1550-1800, 52 HASTINGS L.J. 1255, 1260-61 (2001); Edward C. Walterscheid, Defining the Patent and Copyright Term: Term Limits and the Intellectual Property Clause, 7 J. INTELL. PROP. L. 315, 321 (2000).

9 The most prominent example is that of industrial design, whose aesthetic form might not be protected by copyright because of its functionality and whose functionality might not be protected by patent because of insufficient “inventiveness.” Other subject matters that have been the subject of special or proposed legislation include typeface designs, catalogues, semiconductor chips, technical drawings, and plant varieties. Professor Reichman is the leading scholarly analyst of these regimes. His many articles on the subject include J.H. Reichman, Charting the Collapse of the Patent-Copyright Dichotomy: Premises for a Restructured International Intellectual Property System, 13 CARDozo ARts & ENT. L.J. 475 (1995); J.H. Reichman, Computer Programs as Applied Scientific Know-How: Implications of Copyright Protection for Commercialized University Research, 42 VAND. L. REV. 639 (1989); J.H. Reichman, Design Protection in Domestic and Foreign Copyright Law: From the Berne Revision of 1948 to the Copyright Act of 1976, 1983 DUKE L.J. 1143 (1983); Jerome H. Reichman, Electronic Information Tools—The Outer Edge of World Intellectual Property Law, 24 ICC: INT’L R. INDUS. PROP. & COPYRIGHT L. 446 (1993); J.H. Reichman, Legal Hybrids Between the Patent and Copyright Paradigms, 94 COLUM. L. REV. 2432 (1994).
at times seen to be insufficient, in that subject matters thought to be worthy of protection were left out of both, conflicts of dual application were rare. Indeed, the application of copyright to nonfunctional works of art, music, and literature and the application of patent to functional works of technology seemed so clearly distinct that there was very little communication between practitioners in the two areas.\(^\text{10}\) Scholarly analysis, too, and for the same reason, was usually carried out within one or the other of the major paradigms, with little or no discussion of the other.\(^\text{11}\)

Notwithstanding the historical independence of patent and copyright from one another, both regimes have a common overall goal. They seek to promote the general welfare by protecting the fruits of intellectual creativity from activities that would undermine the author’s or inventor’s ability to reap a fair return from investments of time, money, or talent.\(^\text{12}\) They go


\(^{11}\) For example, two of the most often cited works on the economics of copyright make only cursory reference to either patent law or functionality. Professor Landes and Judge Posner justify copyright’s defense of independent creation on the grounds that inventions can be compactly described and therefore searched and that a search of all extant copyright-protected works would be infeasible. William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUDIES 325, 345 (1989). They do not, however, attempt to explain what it is about patent subject matter that distinguishes it from copyright subject matter and makes it amenable to compact description. In discussing the scope of protection, they point out that all copyright-protected works make use of stock characters and situations, obtained at zero cost, that are “not comparable” to the costly-to-develop inventions that are the subject of patent law, which they say justifies the idea/expression distinction. *Id.* at 349-50. They examine the alternative of relying solely on originality to determine the scope of copyright, but reject it on the ground that authors and publishers would not know in advance what was protected. *Id.* at 350. They do not discuss why “claims” to copyright originality could not be made in the same way that inventions are claimed under patent law. The only time these authors discuss functionality in contrasting patent and copyright is to state that copyright’s refusal to protect building design (at the time their article was written) was based on the functionality of buildings, making copyright’s long term of protection unsuitable. *Id.* at 352. Thus, they seem to assume that functionality is at least part of the boundary between the two regimes, but they do not elaborate.

Justice (then Professor) Breyer’s extensive study of copyright economics gives even shorter shrift to patent law and functionality. Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281 (1970). He cites an earlier study questioning the justification for patent law as suggesting a similarly ambiguous basis for copyright and points out that the justifications for extending the term of copyright could also be applied to the patent term. *Id.* at 322, 328. He also raises some questions about the desirability of protecting computer programs under patent law. *Id.* at 348-49. Functionality gets only incidental mention as an aspect of computer programs. *Id.* at 341, 343 n.245.

\(^{12}\) The U.S. Constitution gives Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” U.S. CONST. art I, § 8, cl. 8. The use of the term “fair return” here is deliberately vague on whether the patent and copyright regimes are based on natural rights of authors and inventors or on the instrumental notion that the exclusive rights in authors and inventors are simply a means to achieving the overarching goal of public benefit through the more general availability of desirable works. This author remains firmly in the instrumentalist camp, although the issue need not be resolved here. See Dennis S. Karjala, *Federal Preemption of Shrinkwrap and On-Line Licenses*, 22 U. DAYTON L. REV. 511, 514-17 (1997) (further discussing the instrumentalist/natural rights debate).
about their daily business, however, in very different ways.\textsuperscript{13} Copyright arises automatically upon fixation of copyright subject matter in a tangible medium. The scope of copyright protection is defined by the vague idea/expression dichotomy. Copyright infringement is determined by the equally vague "substantial similarity" standard, and the term of copyright protection endures for seventy years after the death of the author. Patents, on the other hand, issue only upon formal application and after examination by a skilled examiner for novelty and nonobviousness. The scope of patent protection is defined and narrowly limited by the claims, and the term of patent protection is only twenty years. As long as the distinctions between the respective subject matters covered by these regimes were well defined, creators might have had an abstract preference for one regime over the other, but there was little they could do about it. Nonfunctional works of art, literature, and music were covered by copyright, and functional works of technology were covered by patent.

The advent of digital technologies changed all that. Patent's initial foot-dragging with respect to computer programs (functional subject matter)\textsuperscript{14} allowed copyright to establish a firm beachhead in this crucial field of technology.\textsuperscript{15} Now patent is a major player in the field of software protection\textsuperscript{16} and has recently expanded its subject matter coverage to include "business methods."\textsuperscript{17} The former expansion is, or should be, relatively

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\item[15] Computer programs differ from most earlier works of technology in that they can be copied for competitive commercial redistribution essentially without start-up costs for the competitor, thereby severely reducing or even eliminating the original creator's lead time. Dennis S. Karjala, \textit{Copyright, Computer Software, and the New Protectionism}, 28 JURIMETRICS J. 33, 41 (1987) [hereinafter \textit{New Protectionism}]. Moreover, patent is insufficient to protect all computer programs from incentive--eroding piracy, because many computer programs will not contain any patentable technology. \textit{A Coherent Theory}, supra note 13, at 67. Therefore, even if patent had recognized its role at an earlier stage, some form of additional protection against slavish copying of object code, at a minimum, would likely have been deemed necessary.
\item[16] Cohen \\ & Lemley, supra note 14, at 11.
\item[17] State Street Bank \\ & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1375 (Fed. Cir. 1998). Prior to \textit{State Street Bank}, courts had generally required the instantiation of business-related inventions in some physical structure, such as a railway ticket physically detachable from its base. Cincinnati Traction Co. v. Pope, 210 F. 443, 446 (6th Cir. 1913); see also John R. Thomas, \textit{The Post-Industrial Patent System}, 10 FORDHAM INTELL. PROP. MEDIA \\ & ENT. L.J. 3, 12-13 (1999) (noting the requirement of physical instantiation and enhanced business transactions).
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uncontroversial, at least in principle, but the latter has come under heavy criticism and has engendered a number of suggestions for damage control. Under the authority of Baker v. Selden, courts over the years have

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18 Software, as such, is the technology for making computers operate, and it is difficult to see now just why patent had so much trouble reaching this conclusion. In any event, software as technology does not cause any patent subject matter concerns today. Vincent Chiappetta, Defining the Proper Scope of Internet Patents: If We Don't Know Where We Want to Go, We're Unlikely to Get There, 7 MICH. TELECOMM. & TECH. L. REV. 289, 296 (2001). The key problem is distinguishing between software as computer-use technology and software that routinely implements a perhaps novel algorithm or composes a novel piece of music. Id. at 296 n.21; Relative Roles, supra note 10, at 57-63; see also Moy, supra note 6, at 1071-77 (discussing the artificiality of the method/apparatus distinction and noting that methods recognized as nonstatutory but claimed as apparatus can be weeded out via the novelty or nonobviousness criteria).


20 See, e.g., Margo A. Bagley, Internet Business Model Patents: Obvious by Analogy, 7 MICH. TELECOMM. & TECH. L. REV. 253, 277, 281-82, 288 (2001) (recommending expansion of what is considered “analogous prior art” and narrowing the doctrine of equivalents to deal with business-method patents); Chiappetta, supra note 18, at 348-60 (recommending sui generis legislation to handle methods in the “competitive arts” but suggesting various means of implementing current law and practice in application to patent disputes resolved under current law); John Kasdan, Obviousness and New Technologies, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L. REV. 159, 182-84 (1999) (recommending that the U.S. Patent and Trademark Office (“PTO”) employ more, and more qualified, examiners for business patents and legislative provision for PTO waiver of the presumption of validity); Robert P. Merges, As Many As Six Impossible Mistakes Before Breakfast: Property Rights for Business Concepts and Patent System Reform, 14 BERKELEY TECH. L.J. 577, 581 (1999) (suggesting steps for limiting any negative effects of business-method patents); Moy, supra note 6, at 1062 (reform requires addressing the fundamental nature of business method patents as well as the decisional criteria used to determine patent subject matter); Maureen A. O’Rourke, Toward a Doctrine of Fair Use in Patent Law, 100 COLUM. L. REV. 1177, 1249-50 (2000) (recommending adoption of a fair use doctrine tailored to the needs of patent law); Richard H. Stern, Scope-of-Protection Problems With Patents and Copyrights on Methods of Doing Business, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 105, 153 & n.179 (1999) (recommending adapting copyright’s “fair use” doctrine for patent, so that a patent claim that preempts a business will be deemed to fall outside the coverage of patent subject matter). Cf. Cohen & Lemley, supra note 14, at 8 (recommending the judicial adoption of interpretative canons to limit the scope of software claims and for assessing equivalence). But see Greg S. Fine, Note, To Issue or Not to
denied copyright protection to a variety of schemes and plans for accomplishing real-world tasks. However, especially in recent years, copyright has quietly been expanding its role in the protection of functional works beyond computer programs, with courts protecting taxonomies and other systems for presenting or organizing information, techniques for producing factual information, and even business and teaching methods.

This Article argues that the clamor over business methods as patent subject matter basically misses the real issue. The principle of hardware/software equivalence—that is, the principle that for every general purpose computer running under the control of computer software there is an equivalent device consisting solely of hardware that is indistinguishable—basically eliminates the subject matter issue for the programmed machine itself. Suppose, for example, that someone has an electronic machine composed solely of hardware (physical wires, transistors and other circuit elements, solder joints, and so forth) that accomplishes a particular

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21 See, e.g., Chamberlin v. Uris Sales Corp., 150 F.2d 512, 513 (2d Cir. 1945) (rulebook for “Acey-Ducey” card game not infringed by description of same game with different language); Affiliated Enters., Inc. v. Gantz, 86 F.2d 597, 598 (10th Cir. 1936) (pamphlet describing system for enticing customers to entertainment events by a free lottery does not protect the system); Affiliated Enters., Inc. v. Gruber, 86 F.2d 958, 961 (1st Cir. 1936) (stating that however good a plan or system is, it cannot be copyrighted and, if not patented, becomes the property of the public upon disclosure); Brief English Sys., Inc. v. Owen, 48 F.2d 555, 556 (2d Cir. 1931) (system of shorthand writing by condensing words into fewer letters not protected by copyright); Taylor v. Comm’n, 51 F.2d 915, 917 (3d Cir. 1931) (plan for acquiring supremacy of classified advertising by newspapers is not protected by the copyright in its disclosure and so is not depreciable property under the income tax laws); Burk v. Johnson, 146 F. 209, 213 (8th Cir. 1906) (copyright in “Articles of Association” gave no exclusive right to organize and operate under the plan disclosed); Kepner-Trego, Inc. v. Carabio, 203 U.S.P.Q. 124, 130 (E.D. Mich. 1979) (copyright in teaching materials does not extend to the problem-solving techniques they describe); Briggs v. N. H. Trotting & Breeding Ass’n, Inc., 191 F. Supp. 234, 236 (D.N.H. 1960) (horse race betting system unprotected as a game and as being too elementary and ordinary); Aldrich v. Remington Rand, Inc., 52 F. Supp. 732, 734 (N.D. Tex. 1942) (forms included in brochure describing system to facilitate collection of taxes and necessary to use the system are not protected); Seltzer v. Sutbrock, 22 F. Supp. 621, 630 (S.D. Cal. 1938) (system for conducting races on roller skates is not copyright protectable). See generally Pamela Samuelson, Computer Programs, User Interfaces, and Section 102(b) of the Copyright Act of 1976: A Critique of Lotus v. Paperback, 6 HIGH TECH. L.J. 209, 226-27 n.73 (1991) (noting that “when an arrangement of words is a constituent part of a system, the arrangement is not within the scope of copyright protection for the work, no matter how valuable or innovative it might be”).

22 See, e.g., Overhead Door Corp. v. Chamberlain Group, Inc., 194 F.3d 1261, 1269 (Fed. Cir. 1999) (noting that any software process can be transformed into an equivalent hardware process and vice versa); Bagley, supra note 20, at 276 (noting that any software process can be transformed into an equivalent hardware process and vice versa); Pamela Samuelson et al., A Manifesto Concerning the Legal Protection of Computer Programs, 94 COLUM. L. REV. 2308, 2319 (1994) (noting that hardware and software are interchangeable).
task (such as receiving and playing radio signals or calculating sums). No one would deny that this machine constitutes patent subject matter. The principle of hardware/software equivalence says that the function of this machine may be exactly duplicated solely with software and a general purpose computer (and perhaps some input/output devices). If the pure hardware device is patent subject matter, which it is, there can be no basis for denying similar status to a machine built with software that does exactly the same thing. We are thus forced to inquire more carefully into the process the programmed machine is implementing via the software to determine whether a patent is available. Abstract ideas, laws of nature, and natural processes, as well as the art, literature, and music constituting the subject matter of traditional copyright, remain outside the bounds of pat-

24 35 U.S.C. § 101 (2000) ("Whoever invents ... any new and useful ... machine ... may obtain a patent therefor, subject to ... this title.").

25 Merges, supra note 20, at 586 ("When these software-embedded concepts are characterized as novel computer programs, there is little to separate them from any other computer program.").

26 The exclusion of art, literature, and music from patent coverage has been thought so obvious that it often remains only implicit. The Federal Circuit has interpreted Supreme Court patent jurisprudence to mean that "anything under the sun that is made by man" is patent subject matter, subject only to exclusions for "laws of nature, natural phenomena, and abstract ideas." AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1355 (Fed. Cir. 1999), citing Diamond v. Diehr, 450 U.S. 175, 185 (1981) (citing Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980) (patent subject matter includes "anything under the sun that is made by man"). Indeed, Judge Archer's dissent in Alappat expressed, in the form of a reductio ad absurdum, the fear that including computer programs embodied in a tangible medium within patent subject matter would lead to the patentability of new and nonobvious music and literature. In re Alappat, 33 F.3d 1526, 1566 (Fed. Cir. 1994) (Archer, J., dissenting); see also Dan L. Burk, Patenting Speech, 79 Tex. L. Rev. 99, 101-05 (2000) (investigating the implications for patent law of treating software as speech). The PTO attempted to address this fear in adopting its 1996 Guidelines by dividing "descriptive material" embedded in an article of manufacture into "functional" and "non-functional" categories and treating the latter as nonstatutory subject matter. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7478, 7481 (Feb. 28, 1996); see Chiappetta, supra note 14, at 122-23, 140 & n.242 (further discussing "descriptive material" and "functional" and "non-functional" categories).

In Chakrabarty, the Supreme Court found a human-made microorganism to constitute patent subject matter. Chakrabarty, 447 U.S. at 309. The Court asserted that the "Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject to 'include anything under the sun that is made by man.'" Id. The Court thus failed to note the implicit exclusion from patent coverage of art, music, and literature, which are certainly "human made," if not (as intangibles) literally "under the sun." Id. Professor Malla Pollack has also pointed out to me in a private communication that the Court clearly misread the congressional history in support of its broad interpretation of patent coverage. For example, the Senate Report cited by the Court states: "A person may have 'invented' a machine or a manufacture, which may include anything under the sun that is made by man, but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled." S. REP. NO. 1979 (1952), reprinted in 1952 U.S.C.C.A.N. 2394, 2399 (emphasis added). Therefore, the "anything under the sun" quote cannot legitimately be offered as justification for an expansive reading of the statute, because the full context explicitly states that patentability is subject to the conditions of the statute. Nevertheless, the Court relied heavily on Chakrabarty recently in continuing its expansive interpretation of § 101 (without explicitly using the "anything under the sun" quote). J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 130-31, 145 (2001). Supreme Court jurispru
ent.\textsuperscript{27} We must, therefore, distinguish between the technological software that implements any of these unprotected subject matters and the subject matters themselves.\textsuperscript{28} Retaining the exclusion of business methods from patent subject matter would not eliminate the need for this distinction.\textsuperscript{29} While that alone is not a ground for deeming business methods to be patent subject matter, a valid ground may arise from consideration of what would likely happen under copyright if they remain categorically excluded from patent coverage.

Patent’s initial failure to protect computer software to any degree, coupled with congressional reliance on copyright to protect against piracy of code, led initially to a great expansion of copyright protection for computer programs. Courts not only held that code was protected by copyright but also the “structure, sequence, and organization” of the program as well as functional aspects of the user interfaces.\textsuperscript{30} Since 1992 courts seem to have cut back somewhat on the heavily overprotective scheme they had devised for computer programs,\textsuperscript{31} but judicial misunderstanding of the scope and
dence, therefore, certainly leaves a broad scope for patent subject matter, but no one has suggested that the Court would extend § 101 to traditional art, music, or literature.

\textsuperscript{27} AT&T allows applied mathematical algorithms as patent subject matter, distinguishing between a “mathematical formula alone . . . viewed in the abstract” and its application in a “useful” manner as an integral part of a machine or process. AT&T, 172 F.3d at 1356-57. Drawing this line will not be easy, whether or not business methods are deemed patent subject matter under § 101. See Durham, supra note 19, at 1523 (discussing the difficulty of distinguishing between technological computer programming and a nontechnological concept implemented by a computer program); Gruner, supra note 6, at 396, 467-68 (arguing for patent subject matter where intangible algorithms are used to analyze physically significant information, particularly where innovations are susceptible to development by agents and are transferable to user-principals).

\textsuperscript{28} Thus, a machine programmed to play a new piece of music would be patent subject matter, but the music, as nonpatent subject matter, contributes nothing to the patentability analysis. Chiappetta, supra note 14, at 143, 172 (distinguishing software as computer-implementation technology, which is always patent subject matter, and software as language to communicate an algorithm or process, which must be tested independently under the exclusions for abstract ideas or traditional art, music, and literature); Relative Roles, supra note 10, at 58-60 (arguing that computer implementation of an abstract theory would be patent subject matter but not patentable if the only advance is in the nontechnological theory); see also discussion supra note 18.

\textsuperscript{29} Professor Moy has identified the problem of distinguishing patent-subject matter information-based methodologies and non-patent-subject matter abstract ideas as the fundamental problem facing the patent system. Moy, supra note 6, at 1089. On the general problem of distinguishing unpatentable abstract ideas from patentable inventions in information processing, see Gruner, supra note 6.


\textsuperscript{31} See, e.g., Computer Assocs. Int’l, Inc. v. Altai, 982 F.2d 693, 721 (2d Cir. 1992) (adopting an abstraction-filtration-comparison analysis to insure against infringement based on similarity to unprotected elements of a computer program); Lotus Dev. Corp. v. Borland Int’l, Inc., 49 F.3d 807, 818-19 (1st Cir. 1995) (holding that a menu command hierarchy could not be copyrighted), aff’d by an equally
purpose of a software copyright remains widespread.32 Most business methods for which patents are sought are implemented by computer. Thus, copyright protects the implementing computer program. If the process implemented by the computer, through the program, is seen by copyright courts as "creative" (even though the program code itself may be perfectly routine), they are likely to try to correct with copyright what they view as wrongful appropriation of the fruits of another's creativity.33 This could easily lead to the same intellectual property mess for business methodologies that we had for computer software.

Basically, if patent is bad for business methods, copyright is worse. It is therefore better to deal with this subject matter under patent and try to limit the damage by insisting on application of the traditional patent norms of objectively verifiable and specific claims, a meaningful utility requirement, narrow notions of equivalence in determining infringement, and a real nonobviousness hurdle.34 The same reasoning that leads to this conclusion for business methods, however, also applies more generally to any functional process. Part II of this Article argues for functionality and incremental improvability as the touchstone for denying copyright protection. Part III then considers a number of situations in which copyright courts have either protected or come dangerously close to protecting sub-

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33 One federal district court long ago explicitly recognized the problem. At issue in Briggs v. New Hampshire Trotting & Breeding Association, Inc., 191 F. Supp. 234 (D.N.H. 1960), was whether copyright in a brochure describing a betting system for horse races covered the system itself. The court saw the relevance of Baker v. Selden but thought that Baker and its progeny involved processes that were clearly patentable, as opposed to sports, games, or similar systems: "But if games, sports, and similar systems and plans are neither copyrightable nor patentable, then there is a hiatus in the law which unjustly fails to offer protection to original inventors." Briggs, 191 F. Supp. at 236. The court denied copyright protection in the actual case, both because the copyright statute and the case law does not protect games, sports, and similar systems and also because the system involved in the case was "so elementary and ordinary that it is in the public domain." Id. at 236-37. The court strongly implied, however, that "original, complex, unique systems" would be protected. See id. at 236 (drawing a distinction between elementary and complex systems). Thus, categorical denial of patent protection could, under this reasoning, lead to copyright protection for complex, albeit functional, systems. See discussion infra notes 314-35 and accompanying text.

34 Professor Lemley has pointed out that relatively few issued patents are the subject of enforcement action. He forcefully argues, therefore, that litigating those few patents is a more efficient way of determining validity than ex ante examination by the PTO of all patents. Mark A. Lemley, Rational Ignorance at the Patent Office, 95 Wis. U. L. Rev. 1495, 1514 (2001). His argument also leads almost inexorably to the conclusion that the presumption of validity after PTO examination should be abandoned, or at least reduced. Id. at 1527-30. None of these conclusions affects the patent subject matter analysis offered herein. Whether determination of patent invalidity occurs at the PTO or in the courts, the important point is that the determination for functional works be based on grounds like anticipation or obviousness rather than subject matter.
ject matter that should, under this functionality analysis, lie outside of copyright. Part IV then returns to the question of whether patent must inevitably be the quid pro quo for denying copyright protection or whether we can safely attempt to deny protection, on categorical subject matter grounds, under both regimes.

II. PATENT AND COPYRIGHT SUBJECT MATTER

A. Functionality and Incremental Improvability—The Distinction Between Patent and Copyright Subject Matter

Why do we have two very different statutes aimed at protecting the fruits of intellectual creativity? I have addressed this question on numerous occasions in attempting to define the appropriate scope, beyond code, of the copyright in a computer program.\textsuperscript{35} In that context, I have argued that patent protects creative but functional invention, while copyright protects creative but nonfunctional authorship.\textsuperscript{36} For these purposes, I have defined “functional” to be distinct from merely “useful”\textsuperscript{37} and have relied on the Copyright Act’s definition of a “useful article” as a starting point for focusing on the differences between patent and copyright subject matter: “A ‘useful article’ is an article having an intrinsic utilitarian function that is not merely to portray the appearance of the article or to convey information.”\textsuperscript{38} Thus, maps and dictionaries, while often “useful,” are not “useful

\textsuperscript{35} E.g., A Coherent Theory, supra note 13, at 56-66; Dennis S. Karjala, Copyright Protection of Computer Software, Reverse Engineering, and Professor Miller, 19 U. DAYTON L. REV. 975, 976-83 (1994) [hereinafter Copyright Protection] (originally published under the erroneous title Copyright Protection of Computer Documents, Reverse Engineering, and Professor Miller); Relative Roles, supra note 10, at 44-50.

\textsuperscript{36} Cf. Ralph S. Brown, Eligibility for Copyright Protection: A Search for Principled Standards, 70 MINN. L. REV. 579, 604 (1985) (arguing that the “patent/copyright boundary reflects the distinction in purpose between encouraging technological innovation and stimulating creative expression”).

\textsuperscript{37} A Coherent Theory, supra note 13, at 56-58.

\textsuperscript{38} 17 U.S.C. § 101 (2000) (defining the term “useful article”). There is nothing in the statute or the legislative history to indicate that this definition was intended by the drafters to do any more than address the problem of industrial design, through the definition of pictorial, graphic, and sculptural (“PGS”) works in § 101 (denying to useful articles classification as PGS works to the extent that their form is inseparable from their function) and through whatever limitations are imposed on copyright rights by § 113 (freezing the copyright owner’s rights in useful articles at whatever they were on December 31, 1977, just before the 1976 Copyright Act went into effect). Id. § 101 (defining “useful article”); id. § 113 (defining the scope of rights in PGS works). Still, even if adventitious, the definition captures much of the core difference between patent and copyright subject matter. Most importantly, it makes clear that even highly “useful” things are not “useful articles,” a point that is very often lost on commentators and courts who discuss functionality for purposes of copyright. Thus, maps, dictionaries, and recipe books, although “useful,” are not “useful articles” within the definition, nor are they “functional” within the definition offered in the text. Some commentators have used the “functionality” of things like architectural plans, choreography, musical scores, and stage directions as a basis for asserting that functionality is not a bar to copyright protection. E.g., Jane C. Ginsburg, Four Reasons and a Paradox: The Manifest Superiority of Copyright Over Sui Generis Protection of Com-
articles” under this definition (and are therefore not “functional” under my definition) because their sole utility is to convey information. This disarmingly simple definition captures much of the distinction between the functional subject matter of traditional patent law and the informational subject matter (however useful) of traditional copyright law. We have made this distinction because the social desirability of allowing later creators of functional works to build on and improve what has come before necessitates a more clearly defined property right in technological advances, a shorter term of protection, and (at least in theory) a more significant (nonobvious) step forward. Whatever the correctness of copyright’s broad scope of protection for traditional literary and artistic works and its extremely long term of protection, they are wholly inappropriate to useful arts that pro-

puter Software, 94 COLUM. L. REV. 2559, 2566 (1994); Arthur R. Miller, Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?, 106 HARV. L. REV. 977, 986 (1993). Professor Weinreb also uses the terms “useful” and “functional” more or less interchangeably, treating an accounting system as functional because it displayed accounting information simply and clearly. Lloyd L. Weinreb, Copyright for Functional Expression, 111 HARV. L. REV. 1149, 1178 (1998). It is not clear, however, that his conclusions about what is “functional” and what is not would be much, if at all, different from those contained herein. Nevertheless, I believe the distinction between “useful” and “functional” is worth putting explicitly on the table. The usefulness of stage directions, dictionaries, and the like, inheres solely in their communication of information to human beings. This kind of “usefulness,” which depends for its value solely on the reactions of a human consumer of the work, is not “functional” within the meaning of the “useful article” definition in the Copyright Act or in the sense used herein to lay the foundation for distinguishing patent and copyright subject matter.

39 Professor Lunney has pointed out that the Federal Circuit has been lowering the “nonobviousness” bar and seems now to be treating just about any novel advance as nonobvious. Glynn S. Lunney, Jr., E-Obviousness, 7 MICH. TELECOMM. & TECH. L. REV. 363, 373-74 (2001). He cogently argues that this will encourage the investment of creativity in less socially desirable projects. Id. at 411-12. Judge Pauline Newman and former PTO director Q. Todd Dickinson both agreed recently that most patents cover only minor advances or improvements. Joint Hearings, Federal Trade Commission and Department of Justice, Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, Feb. 6, 2002, reported in 7 ELECTRONIC COMMERCE & L. REP. (BNA) 138, 139 (Feb. 13, 2002). Professor Lunney, however, strongly disagrees with the notion of “functionality” as the touchstone for distinguishing patent and copyright subject matter. See infra notes 72-105 and accompanying text.

40 Robert Gorman has reminded me that there is a sense in which patents have a broader scope of protection than copyrights: Patents can protect ideas and algorithms while copyright supposedly protects only the particular expression of these more abstract concepts. See Relative Roles, supra note 10, at 45 n.8. As used herein with respect to the scope of copyright protection for traditional literary and artistic works, “broad protection” refers to the author’s exclusive right to create derivative works that can be substantially different from the underlying work and the protection for “nonliteral” elements, like detailed plot sequence, that is afforded to these works. E.g., Sheldon v. Metro-Goldwyn Pictures Corp., 81 F.2d 49, 55 (2d Cir. 1936). The scope of a patent is strictly tied to the claim language and, in that sense, patents are more narrowly defined than copyrights. So, even though patents cover things that copyrights do not cover, they are not necessarily broader when measured from the respective starting points of the two rights—the claims in the case of patents and the fixation of the entire underlying work in the case of copyrights.
gress by incremental contributions from a wide variety of sources.\textsuperscript{41}

Traditional copyright subject matter was indeed nonfunctional under this definition, because it was useful only in entertaining (by presenting an appearance or sound) or informing human beings.\textsuperscript{42} However, this approach of treating functional works as patent subject matter must make an exception for computer program code (at least application program code\textsuperscript{43}). While code is clearly functional under my definition, Congress mandated copyright protection for code in adopting the recommendations of the National Commission on New Technological Uses of Copyright Works ("CONTU").\textsuperscript{44} An exception for program code is also necessary as a policy matter, because of the vulnerability of program code to fast and inexpensive electronic copying.\textsuperscript{45} Program code is therefore a \textit{sui generis} ex-

\textsuperscript{41} A Coherent Theory, supra note 13, at 61-62; see also Stewart E. Sterk, Rhetoric and Reality in Copyright Law, 94 Mich. L. Rev. 1197, 1213 (1996) (that patents are more difficult to obtain and endure for shorter periods shows that Congress is more concerned about monopoly power over useful articles).

\textsuperscript{42} Pamela Samuelson, CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form, 1984 Duke L.J. 663, 749 (1984) (arguing that the essence of copyright, as opposed to other intellectual property systems, is that "the content of a copyrighted work has always had some nonfunctional aesthetic, informational, or entertaining qualities which are communicated to a human audience").

\textsuperscript{43} Whether and to what extent operating software, with the powerful network effects it engenders, should be protected by copyright is another question. Dennis S. Karjala, Copyright Protection of Operating Software, Copyright Misuse, and Antitrust, 9 Cornell J.L. & Pub. Pol'y. 161, 161 (1999).

\textsuperscript{44} National Commission on New Technological Uses of Copyright Works, Final Report (1978), available at http://www.ifla.org/documents/libraries/policies/contu.txt (last visited Nov. 5, 2002) (on file with the Connecticut Law Review). That there is necessarily an exception to the functionality doctrine for program code by no means implies that other elements of programs, such as program structure or interfaces, also fall under the copyright protective umbrella. Indeed, these other elements are no more vulnerable to fast and inexpensive copying than more traditional works of technology. Therefore, such elements should be protected by copyright, if at all, only if they independently comprise copyright subject matter (such as fanciful screen graphics), and not under the program copyright as "nonliteral elements" of the program. E.g., A Coherent Theory, supra note 13, at 66-72. This is not to say that the members of CONTU had any real understanding of the technological subject matter with which they were dealing. There were no computer scientists, representatives of hardware or software industries, or users of complex software systems on the Commission. Samuelson, supra note 42, at 699. However, the CONTU Report explicitly deals only with examples involving literal copying of code, and there is no reference to sequence, structure, and organization ("SSO"), nonliteral elements, user interfaces, or reverse engineering. A Coherent Theory, supra note 13, at 68 & n.46. So, while CONTU did not expressly limit copyright protection to code, it also neither envisioned broader protection nor considered the effect that broader copyright protection might have on technological innovation. The most we can say with confidence, therefore, is that CONTU recommended, and Congress adopted, the protection of code. Because of code's functionality, this decision represents an important departure from the historical division between patent and copyright subject matter. Going further to protect functional noncode elements of programs under copyright cannot be justified by reference to CONTU or to Congress's adoption of its recommendations.

\textsuperscript{45} A Coherent Theory, supra note 13, at 66-72. Anti-misappropriation considerations might justify "thin" copyright protection for limited classes of other works as well. These are situations, like that for computer program code, in which patent law's more stringent requirements would deny coverage to works that are significantly more expensive to create in the first instance than to copy once made.
ception to § 102(b)\textsuperscript{46} and to \textit{Baker v. Selden},\textsuperscript{47} which is the foundation of the general rule that patent, and not copyright, has the job of protecting function.\textsuperscript{48} Excepting functional program code from the functionality test for distinguishing patent and copyright subject matter, however, does not mean that functionality should play no future role in separating these two classes of intellectual property.\textsuperscript{49} Indeed, if functionality were to be abandoned, we would be forced to inquire what sense, if any, it would make to continue with two such different modes of protection.\textsuperscript{50}

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Blank forms, for example, might fall into this category. \textit{See} discussion \textit{infra} notes 175-85 and accompanying text. Sets of standardized test questions are another class of functional work for which thin copyright might be justified on anti-misappropriation grounds. \textit{See} discussion \textit{infra} notes 300-13 and accompanying text. Copyright protection for the functional features of architectural works cannot be defended on this ground, but it is not entirely clear whether the architectural work copyright extends to functional features. \textit{See} discussion \textit{infra} note 50.

\textsuperscript{46} \textit{See} 17 U.S.C. § 102(b) (2000) (stating 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”).

\textsuperscript{47} 101 U.S. 99, 102 (1879) (“To give to the author of the book an exclusive property in the art described therein, when no examination of its novelty has ever been officially made, would be a surprise and a fraud upon the public. That is the province of letters-patent, not of copyright.”).


\textsuperscript{49} Nor does it mean that the functionality doctrine plays no role in deciding which noncode elements of programs, if any, are protected by the program copyright. \textit{See} discussion supra note 44. \textit{Cf.} Douglas E. Phillips, \textit{XML Schemes and Computer Language Copyright: Filling in the Blanks in Blank Esperanto}, 9 J. INTELL. PROP. L. 63, 106-07 (2001) (computer languages are functional “systems” whose functionality is uniquely specified by their particular expression). Because noncode elements of programs like SSO and user interfaces are not vulnerable to piracy in the same way that literal code is, there is no reason to interpret the program copyright broadly for these functional elements. Patent law works perfectly well for functional developments in these areas. \textit{A Coherent Theory}, supra note 13, at 69-70.

\textsuperscript{50} Architectural works may be a second example of a class of works that, like computer software, are functional and yet are protected by copyright. Traditional copyright protection for architecture was limited to the actual graphic works constituting the blueprints and other design documents. \textit{Demetriades v. Kaufmann}, 680 F. Supp. 658, 663 (S.D.N.Y. 1988). Direct copying of such documents was copyright infringement, but erecting the building making use of such documents was not. \textit{Id.} at 664. However, the statute now protects “architectural works,” defined as the “design of a building,” including its “overall form as well as the arrangement and composition of spaces and elements in the design.” 17 U.S.C. §§ 101, 102(a)(8) (2000). It is not clear whether Congress intended that functional aspects of building design be protected by the architectural work copyright. One indication that it did intend to protect function, to some degree, lies in its deliberate avoidance of the separability test used to distinguish form from function in “pictorial, graphic, and sculptural works.” \textit{H.R. REP. NO. 101-735}, at 19 (1990), \textit{reprinted in} 1990 U.S.C.C.A.N. 6935. The legislative history adds that protection will be denied where functional considerations determine a design element, but implies that where other methods of obtaining a particular functional result exist, copyright protection may be available, without addressing the question of efficiency. \textit{Id.} at 20-21. On the other hand, the report also distinguishes between “internal language” of architecture that is said to be “intrinsic to the building” and “determined by pragmatic . . . and technical requirements” from the “poetic language” of architecture that is “responsive to issues external to the building,” stating that the legislation protecting architectural works
Functionality is thus the basic determinant of the patent/copyright boundary: Anything that is a "useful article" under the Copyright Act's definition\(^1\) should be at least prima facie patent, and not copyright, subject matter. Exceptions might be made for certain classes of works for which misappropriation by means of fast, cheap, and easy copying appears to be a particular danger.\(^2\) The Copyright Act's "useful article" definition, however, does not capture the whole of the distinction between patent and copyright subject matter. Copyright protection does not extend, for example, to a "system" or "process,"\(^3\) although applied processes have long been patent subject matter.\(^4\) In particular, many systems (such as accounting systems) or processes (such as how to bake a cake) are conceptual algorithms that inform human beings how to do something but are not self-executing. They are therefore not "functional" under direct application of the Copyright Act's definition of "useful article."\(^5\) We must therefore probe more deeply to find the dividing line between patent and copyright for such intellectual creations.

Now that business methods are no longer categorically excluded from patent protection, the simplest approach may simply be to define systems and processes as functional.\(^6\) This would preserve the formal distinction between the two types of subject matter under a single term. However, it begs the question: What types of systems and processes are truly excluded from copyright under § 102(b)?\(^7\)

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was intended to protect only the "poetic language." Id. at 18-19. The degree to which the new provisions protect functional design aspects is thus unclear. Dennis S. Karjala, Copyright and Misappropriation, 17 U. DAYTON L. REV. 885, 921 n.125 (1992) [hereinafter Copyright and Misappropriation]. In any event, § 102(b) presumably continues to apply to architectural works.

\(^1\) See discussion supra note 38 and accompanying text.

\(^2\) See discussion supra notes 43-50 and accompanying text.

\(^3\) 17 U.S.C. § 102(b) (2000); see supra note 46.

\(^4\) 35 U.S.C. § 101 (2000) ("Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter . . . may obtain a patent therefor . . . ."). For an excellent discussion of the history of process patents, see Thomas, supra note 17.

\(^5\) A Coherent Theory, supra note 13, at 59 n.18.

\(^6\) Cf. Julie E. Cohen, Reverse Engineering and the Rise of Electronic Vigilantism: Intellectual Property Implications of "Lock-Out" Programs, 68 S. CAL. L. REV. 1091, 1145-46, 1200 (1995) (arguing that the elements of computer programs protected by patent must be mutually exclusive from those protected by copyright and treating systems and processes as "functional" to the extent they are excluded from copyright protection under § 102(b)).

\(^7\) A number of courts have found copyright protection for something they were quite willing to denominate a "system." See, e.g., Interactive Network, Inc. v. NTN Communications, Inc., 875 F. Supp. 1398, 1405 (N.D. Cal. 1995) (holding a scoring "system" for interactive predictive football game copyright protected because arbitrary); Soutelho, Inc. v. Kanebridge Corp., 53 U.S.P.Q. 2d 1490, 1493 (E.D. Pa. 2000) (holding a parts numbering "system" copyright protected because unique, non-intuitive, and highly complex), rev'd, 258 F.3d 148 (3d Cir. 2001); Practice Mgmt. Info. Corp. v. Am. Med. Ass'n, 877 F. Supp. 1386, 1392 (C.D. Cal. 1994) (holding that a coding "system" for medical services mandated for federal use does not destroy the copyright in the work), aff'd in part, rev'd in part on other grounds, 121 F.3d 516, 521 (9th Cir. 1997) (affirming copyright protection for the "cod-
In seeking a more general principle for determining the appropriate twenty-first century boundary between patent and copyright, it is instructive to inquire into the historical reasons for the differences between the patent and copyright systems. Why is it that patents are more narrowly defined than copyrights, are harder to get, persist for a shorter time, and are easier to defend against in cases of nonliteral copying, even though both patent and copyright are aimed at the same overall goal of promoting and protecting the fruits of intellectual creativity? We can begin to get a handle on this question by looking at the differences between traditional nonfunctional copyright subject matter and functional patent subject matter. Functional works—works that are used by human beings to do something other than to inform or entertain themselves or others—are usually amenable to objectively measurable incremental improvement. Attaching a motor to a drive shaft and some wheels may be a fundamental advance in the art of transport, but, once available, that basic vehicle can be improved in an incremental series of smaller steps by the addition of brakes, headlights, a roof, windows, bumpers and other crash-protection devices, and so forth. These incremental improvements can themselves each usually be improved, again most often in incremental fashion. If the original vehicle

ing system” but reversing the judgment for copyright misuse). We need not determine at the moment whether these cases were correctly decided. It must necessarily be the case that simply calling something a “system” cannot automatically remove it from copyright protection. For example, a book author might claim that the act of reading her book constitutes a “system” for putting the reader more in touch with his spirituality or a composer might claim that listening to her song is a “system” for curing anxiety. The use of the word “system” in either case should not be dispositive for exclusion from copyright protection as literary or musical works, respectively. Cf. Palmer v. Braun, 287 F.3d 1325, 1331 (11th Cir. 2002) (involving techniques for reconnecting with an experiential awareness of one’s existence); infra note 295. Of course, to the extent that they actually are effective in providing a well-defined health benefit, their “active features” (by analogy to the “active ingredients” in a drug) might fall outside copyright under the idea/expression dichotomy, the merger doctrine, or the more general doctrine against copyright protection of functionality. See discussion infra notes 310-11 and accompanying text. But whether and the extent to which either is excluded from copyright should not depend solely on the author’s categorization of the work.

58 Relative Roles, supra note 10, at 44-45; see discussion supra note 13 and accompanying text. Professor Lemley has reminded me in a private communication that patents prohibit even independent discovery and cover a broader class of things, including sometimes things of which the patentee did not conceive. Independent creation as a defense to copyright infringement, however, will rarely be available for the types of works under analysis here, which by hypothesis are incremental improvements on earlier works. See discussion infra note 215. Indeed, it is easy to overstate independent creation as a limit on copyright protection for published works, to which access must be presumed, when substantial similarity can lead to a determination of “subconscious” copying. Bright Tunes Music Corp. v. Harrisons Music, Ltd., 420 F. Supp. 177, 180-81 (S.D.N.Y. 1976). And whether a patent covers a broader class of things than a copyright may be a matter of perspective. See discussion supra note 40. Patents are at least tied to the literal claim language (subject to the doctrine of equivalents), while copyright in many works extends to nonliteral elements. It is the broad scope afforded to nonliteral elements of many traditional copyright-protected works, such as plays and novels, that can lead a court, reasoning by analogy, to recognize protection even for functional features. The whole point of this Article, of course, is that copyright should not cover functional elements, literal or nonliteral, of a copyright-protected work. In that sense, it seeks to narrow the scope of copyright protection.
were protected by copyright, there is a good chance that the improved vehicle (with the brakes, headlights, etc.) would infringe under copyright’s “substantial similarity” test for infringement. Moreover, the copyright would persist for 70 years after the death of the “author” of the original vehicle, quite possibly well over 100 years.\textsuperscript{59} The inappropriateness of copyright in this case is self-evident. Broad protection for such a long time would give the original vehicle inventor the sole right to make improvements for a century, inhibiting much more improvement in the useful art of vehicle transportation than it would engender.\textsuperscript{60}

The policy basis for the radically different natures of the patent and copyright regimes is thus the social desirability of allowing all those skilled in the relevant art to try their hands at incremental improvement of functional works.\textsuperscript{61} The same can be said of the industrial processes that, while not directly functional under the definition offered above, have long been a part of patent subject matter. A rubber-curing process, for example, can be improved by using a computer to make the complex real-time calculations necessary for determining exactly when to open the mold.\textsuperscript{62} Allowing for incremental improvement in functional works, as defined above, is important for socially desirable technological advancement. And “improvement” in functional works is usually objectively measurable, not in the sense that the improved version is desirable (that is for the market to determine under either the patent or copyright system) but rather that it does what it does, for example, faster, more accurately, more quietly, or using fewer resources, perhaps with a concomitant array of disadvantages over the prior art (in that it takes up more space, costs more to produce, is somewhat more dangerous or difficult to use, and so forth). Whether the improved version actually embodies a particular array of characteristics will be a matter of general agreement, even if not everyone (or indeed anyone) actually chooses to buy or use it.\textsuperscript{63}

\textsuperscript{59} Some Irving Berlin copyrights date from the 1920s, and he did not die until 1989. If the life plus 70 system had been in effect during his lifetime, some of his copyrights would have endured for 130-135 years.

\textsuperscript{60} Cf. Brown, supra note 36, at 609 (arguing that copyright is made easy to provide broad protection to works of enlightenment and diversion but “can be too easily bent to evade the limits [of patent] or extend monopolies that have no support in any system”).

\textsuperscript{61} Relative Roles, supra note 10, at 48; see also A Coherent Theory, supra note 13, at 61 (discussing the social necessity of allowing incremental technological improvement); Copyright Protection, supra note 35, at 979-80 (discussing incremental improvements by later inventors); Cohen & Lemley, supra note 14, at 23 (stating that “[t]o an even greater extent than copyright law, patent law anticipates and even depends on one party improving another party’s invention”).


\textsuperscript{63} I am indebted to Professors Gorman and Weinreb for having made me aware of the need to be explicit about the objective verifiability of “improvements” in functional works, as opposed to artistic works in which “improvement” is largely a matter of taste. The text attempts to do that, but it must be admitted that there remain some types of information works that are also amenable to objectively
Traditional copyright subject matter, on the other hand, is not subject to improvement in the same way; or, at least, allowing incremental "improvement" of traditional works of art, literature, and music is less pressing than for functional works. It is less pressing for informational works like compilations and dictionaries, not because they cannot be incrementally improved but because the disincentive to initial creation would outweigh the benefits of incremental improvements like error corrections. For copyright-protected works like novels or films, it is even less important to encourage incremental improvement by all comers. First, no one can say what an "improvement" is in these cases, because the appeal is to a person's aesthetic taste. Second, "improvement" of these works does not

verifiable improvement. Reference works like dictionaries can be improved with error correction, for example. See discussion infra notes 64-66, 69-71 and accompanying text. Consequently, the basic dichotomy for the patent/copyright borderline must remain the distinction between function on the one hand and information content on the other, where "function," in the context of systems and processes, refers to the application of information to a task other than appreciation by human judgment.

64 Admittedly, the social policy underlying our harsher treatment of unauthorized "modifications" of traditional works of art, literature, and music inheres partially in non-instrumental, natural-rights notions that such works more reflect the personality of the author than functional works falling under the patent paradigm. Indeed, the former are constrained only by the imagination of the author, while the latter are constrained both by the laws of nature and by the functional goals the works are intended to achieve. Still, notions of instrumentalism enter the calculus as well. Society simply does not value a new version of a popular novel with a different final chapter as much as it does a steering wheel added to a motorized vehicle. There is therefore less downside risk in disallowing unauthorized "modifications" for a longer period than is given by patent. This is not to say, of course, that there is no social value in "improvements" to traditional copyright subject matter. After the (increasingly long) "limited time" for which copyright subsists, the market rather than the exclusive rights of copyright determines whether a modification is socially desirable, as some clearly are. One need only think of West Side Story, for example, or the many films based on works by Shakespeare, Jane Austen, Thomas Hardy, and other great authors. At least one commentator has argued on economic efficiency grounds that copyright goes too far in limiting the rights of "improvers." See generally Mark A. Lemley, The Economics of Improvement in Intellectual Property Law, 75 TEX. L. REV. 989 (1997).

65 As the Feist case makes clear, the copyright protection of factual compilations has long posed difficult problems. Asking why illuminates how "incremental improbability" serves as a policy basis for separating patent and copyright subject matter. Compilations cause problems because of our reluctance to protect "facts." Feist attributes copyright's nonprotection of facts to the absence of authorship—"[t]he distinction . . . between creation and discovery." Feist Publ'n, Inc. v. Rural Tel. Serv. Co., Inc., 499 U.S. 340, 347 (10th Cir. 1991). This abstract notion, common sensical as it first appears, is simply wrong. See discussion infra note 119 and sources cited therein. The primary reason for exclusion is that factual information can almost always be incrementally improved, and the more people who are allowed to try their hand at improving factual accuracy, the better our chances that valuable improvement will result. See discussion infra notes 150-55 and accompanying text. On the other hand, collections of mundane facts (like telephone books) might not get produced to a socially desirable extent without some form of intellectual property protection. So, courts adopted the "sweat of the brow" rationale for protecting such collections, which led to all the analytical problems noted in Feist. I eschew extensive discussion of this issue here, because the facts contained in compilations, like any other fact, simply represent information content that lies on the opposite side of the patent/copyright boundary, which is the focus of this Article. (The extent to which functional methods of presenting factual information should be copyright protected is considered infra notes 174-227 and accompanying text.) The incremental-improbability basis for excluding facts from copyright, however, is thus similar to that proffered here for distinguishing patent and copyright subject matter.
build continuously. Few, if any, book lovers would read what is essentially the same novel ten times to see what "improvements" were made by ten successive improvers. This does not necessarily justify the broad scope of copyright protection, which prevents rewriting even entirely new sequels involving the characters created in a protected work.66 It says merely that disallowing incremental improvement of art, literature, and music does not conflict as strongly with underlying economic policy goals as would similar limitations with respect to functional subject matter.

Systems and processes that are "applied in a practical manner to produce a useful result"67 are thus those whose usefulness for their intended purposes generally improves in an objectively articulable, incremental manner.68 Such systems and processes are "functional" and should seek intellectual property protection in the patent, and not the copyright, regime, even though they are not directly functional under the "useful article" definition. The policy basis for channeling these works to the patent system is incremental improvability, in the sense that such systems and processes can be made to achieve their results faster, more cheaply, more efficiently, more accurately, or in more user-friendly ways by allowing general tinkering with their component steps, without unduly undermining incentives for their initial creation or their ongoing development. Copyright protection would give a very long-term monopoly in making those improvements to the first person who describes the system or process in an underlying copyright-protected work. The undesirability of this result is the reason for §102(b). My suggestion here is thus an amplification of what these terms in

66 See Lemley, supra note 64, at 1074 (arguing for a rule that would permit substantial improvers of copyright-protected works to own their original expression). But see Suntrust Bank v. Houghton Mifflin Co., 268 F.3d 1257, 1268 (11th Cir. 2001) (vacating a preliminary injunction on potential fair use "parody" grounds of a new version of Gone With the Wind involving many of the same characters but told from a different perspective). How far the parody rationale of Suntrust will go in allowing outsiders to write sequels remains to be seen. Many sequels will simply try to place in new settings well known characters whom the public has come to know. It seems unlikely, for example, that the recent novels of Laurie R. King, involving the Sherlock Holmes character, would be treated as "parodies" if the famous sleuth were not already in the public domain. Laurie R. King, The Beekeeper's Apprentice (1994); Laurie R. King, A Letter of Mary (1996); Laurie R. King, A Monstrous Regiment of Women (1995); see also Micro Star v. Formgen Inc., 154 F.3d 1107, 1112 (9th Cir. 1998) (concluding that a derivative work results when entirely new computer code is used with an existing program to generate new stories involving the same characters and locations); Anderson v. Stallone, 11 U.S.P.Q.2d 1161 (C.D.Cal. 1989) (denying a derivative work copyright to the author of a new film script involving the "Rocky Balboa" character, because it was created without permission); see also infra note 79.


68 See Brief of George A. Akerlof, Kenneth Arrow et al as Amici Curiae in Support of Petitioners at 14, Eldred v. Ashcroft (2002) (No. 01-618) ("In copyright [as opposed to patent], diverse, 'abundant' expression is the source of value, not successive refinements with respect to an agreed-upon metric of quality, and a large number of disparate innovators may be better at producing abundance.") (quoting Paul Goldstein, Infringement of Copyright in Computer Programs, 47 U. Pitt. L. Rev. 1119, 1123 (1986)).
§ 102(b) should actually mean in practice. I am further suggesting that courts, interpreting § 102(b) in application to such works, are more likely to get the correct result—exclusion from protection as copyright subject matter—if the functional system or process in question is considered patent subject matter.

In drawing the subject matter boundary between patent and copyright for processes relating to information, we must distinguish between improvements in the quality of information content and improvements in the means for gathering, presenting, or using information. Information with no application other than its appeal to the judgment of a human audience is, and for the foreseeable future will remain, the core of copyright, as reflected in the Copyright Act's definition of a “useful article,” even where, for reasons unrelated to the patent/copyright boundary, we deliberately exclude certain information, such as "facts," from copyright protection. Therefore, "improvements" in information content as such should be considered to lie outside of patent coverage, no less than traditional works of art, music, and literature.

On the other hand, some methods or ways of gathering, organizing, presenting, or using information can be improved incrementally by reducing costs, enhancing accuracy, augmenting ease of use or modification, or, more generally, making the use of available information more effective in some objective sense. Like most incremental improvements of existing technology, we may assume that most improvements in information-handling methodologies will not be patentable. The thesis presented here is that, if any such methodology is unpatentable, it should not be on the ground that the method is not patent subject matter. Rather, denial of pat-

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69 See discussion supra note 38 and accompanying text.
70 Feist Pubns., Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 344 (1991). Courts, of course, continue to protect facts as "opinions" or "estimates." See, e.g., CDN Inc. v. Kapes, 197 F.3d 1256, 1260 (9th Cir. 1999) (estimates of used coin prices are the result of a creative process and therefore copyright protectable); CCC Info. Servs., Inc. v. Maclean Hunter Mkt. Reports, Inc., 44 F.3d 61 (2d Cir. 1994) (estimates of used car values are copyright-protectable). The point here, though, is that copyright resolves the social policy balances involved in the protection of information, whether or not given information is actually protected by copyright. Patent law does not, and should not, have any role to play in the protection of information as such. That is reflected in the universally accepted, if rarely articulated, exclusion of traditional copyright subject matter from patent coverage. See discussion supra note 26.
71 We are not considering here abstract ideas or theories of natural law, which are denied protection by both patent and copyright. See, e.g., State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1373-76 (Fed. Cir. 1998); see also 17 U.S.C. § 102(b) (2000); Baker v. Selden, 101 U.S. 99 (1879). Still, both abstract ideas and theories fit comfortably within the concept of "information" that should be and is denied status as patent subject matter. More problematic are functional processes in areas like politics or religion. To the extent that model codes or statutes represent "political" systems, the theory presented herein argues for treating novel and nonobvious functional features as patent subject matter, to help assure their banishment from copyright. See discussion infra notes 247-66 and accompanying text. I am less confident in extending that conclusion more generally, however. See discussion infra Part IV.
entability should be grounded in anticipation, lack of objectively verifiable utility (in the sense that the claimant cannot demonstrate that the methodology does what she claims), failure to enable or distinctly claim, or obviousness. Concomitantly, categorizing these methodologies as patent subject matter should result in their exclusion from copyright protection under § 102(b) of the Copyright Act. The only “arrangements” of information that should be treated as copyright subject matter are those whose appeal lies wholly in the aesthetic appearance of the arrangement or are chosen out of the wholly subjective judgment of the arranger. The next Part of this Article develops these ideas more fully, but first some objections to “functionality” and “incremental improvability” as a basis for distinguishing patent and copyright subject matter must be considered.

B. “Ease of Copying” as the Touchstone for Determining Patent and Copyright Subject Matter

Professor Glynn Lunney has argued that functionality, or utility, has only served as an effective historical proxy for the real difference between patent and copyright subject matter, which he asserts to be “the relative ease with which a competitor could copy the creativity embodied in the product.” Professor Lunney is correct in stating that the creativity embodied in an invention is usually more difficult to copy, especially for mass distribution, than exact copying of traditional copyright subject matter, such as a novel. Copying an automobile, for example, requires the purchase of a variety of materials, hiring of skilled labor, and investment in complex machinery, whereas copying of a novel requires little more than a digital (or even analog) scanner. Copying difficulties with respect to patent subject matter therefore give valuable lead-time to the first creator that can justify the investment of skill, time, and effort, even where the resulting product is not a sufficiently “nonobvious” advance to make it patentable. In the case of computer program code, I have argued that the reduction of this lead time essentially to zero through ease of copying is the justification, indeed the sole justification, for taking that particular technological

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72 Glynn S. Lunney, Jr., Lotus v. Borland: Copyright and Computer Programs, 70 TUL. L. REV. 2397, 2430 (1996). Professor David Friedman reached a similar conclusion in investigating the appropriate intellectual property protection for standards. David Friedman, Standards as Intellectual Property: An Economic Approach, 19 U. DAYTON L. REV. 1109, 1118 (1994) (reasoning that we should expect something like copyright to be applied “[w]here copying is easily accomplished and easily recognized and independent invention unlikely,” and something like patent “[w]here copying is expensive and hard to recognize and independent invention is likely”). For a more extended discussion of Professor Friedman’s approach, see Copyright Protection, supra note 35, at 977 n.5.

73 Lunney, supra note 72, at 2427-28.

74 Id. at 2428-29.
subject matter out of patent and placing it under the copyright umbrella. Moreover, using the same rationale, I have concluded (in complete agreement with Professor Lunney) that the program copyright should protect only against mechanical and nearly exact duplication, and that it should not protect things like the command structure of the Lotus program.

I remain unconvinced, however, that “relative ease of copying” better captures the distinction between patent and copyright subject matter than “functionality,” as interpreted by the concept of incremental improvability. While some industrial processes may require significant retooling before they can be applied, others might involve a relatively simple (though in some cases nonobvious) change in an established assembly line and could be readily copied by a competitor. Yet treatment as patent subject matter does not depend on ease of copying, and patentability itself depends on it at most indirectly, through the nonobviousness analysis. The “relative ease of copying” approach also does not seem to work when we move to copyright’s derivative work right, or non-exact copying. Making a film from a novel requires a huge input of both human and nonhuman resources, much of a creative nature (such as script writing and set design), but it infringes the copyright to do so without permission. Moreover, the scope

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75 E.g., Relative Roles, supra note 10, at 50-51; A Coherent Theory, supra note 13, at 69-70; New Protectionism, supra note 15, at 40.
76 Lunney, supra note 72, at 2431-32, 2435; Relative Roles, supra note 10, at 49-50 & n.23. The “market failure” analysis of the Software Manifesto is virtually identical to that adopted by Professor Lunney and me in looking to the possibilities for incentive-eroding copying as the touchstone for some sort of legal protection. Pamela Samuelson et. al., A Manifesto Concerning the Legal Protection of Computer Programs, 94 COLUM. L. REV. 2308 (1994). Professor Lunney and I are also in agreement that the authors of the Manifesto have not made a convincing case for the vulnerability of non-code elements of computer programs to incentive-eroding copying. Dennis S. Karjala, Misappropriation as a Third Intellectual Property Paradigm, 94 COLUM. L. REV. 2594, 2607 (1994); Lunney, supra note 72, at 2434-35 n.107 (discussing the difficulties involved in duplicating the Lotus command structure).
77 See 17 U.S.C. § 106(2) (2000) (giving copyright owner the exclusive right “to prepare derivative works based upon the copyright work”).
78 Professor Friedman recognizes that copyright protection against nonliteral copying is harder to justify under the “ease of copying” standard. Friedman, supra note 72, at 1118-19.
79 Professor Lemley would treat “radical” copyright improvements, in which the principal value of the improvement lies not in what is taken but rather in what is added, as a fair use. Lemley, supra note 64, at 1081-82. He seems to have been prescient in this proposal. See Suntrust Bank v. Houghton Mifflin Co., 268 F.3d 1257, 1271 (11th Cir. 2001) (denying a preliminary injunction on “parody” grounds of a new version of Gone With the Wind involving many of the same characters but told from a different perspective). However, even Professor Lemley’s theory would not apply to a straightforward film adaptation of a novel. Professor Lunney agrees that many sculptural works might be as difficult to copy as mechanical inventions but argues that copyright protection for them is based principally on the need to disallow unauthorized derivative works. Lunney, supra note 72, at 2429 n.92. The question remains, however, how copyright’s prohibition on unauthorized derivative works fits into the “ease of copying” standard for distinguishing patent and copyright subject matter. While it might be relatively easy for a skilled cartoon artist to put the Mickey Mouse character into an entirely new story, it would seem that most of the effort in creating such a story (once the character is available) is in writing the story and drawing the necessary cartoon panels for it.
of protection under copyright varies greatly from one type of work to another, independently of copying ease. Novels, poems, and other fanciful works are protected broadly and may be infringed without exact duplication of even a single word. On the other hand, rule books, dictionaries, histories, and scientific articles are protected narrowly and are infringed only by verbatim or near-verbatim copying. Yet, a dictionary is not obviously more difficult to copy than a novel of equivalent length. If we were to adopt "relative ease of copying" as an analytical tool for generally distinguishing patent and copyright subject matter, we would be forced to change much of what has come to be well accepted copyright jurisprudence. Finally, the "relative ease of copying" standard does not explain why copyrights subsist so much longer than patents.

80 Sheldon v. Metro-Goldwyn Pictures Corp., 81 F.2d 49, 55 (2d Cir. 1936).
82 Professor Lunney deals at length with copyright's derivative work question in an earlier and very extensive study of how the incentives/access paradigm has led to broader copyright protection than can be justified by notions of economic efficiency in the allocation of investment resources. Glynn S. Lunney, Jr., Reexamining Copyright's Incentives-Access Paradigm, 49 VAND. L. REV. 483, 628-53 (1996). He argues convincingly that some sort of derivative work right may be necessary to compensate for the allocative inefficiency that would otherwise result from the basic public goods problem: Derivative works authors often need to purchase only one copy in order to create derivative products that can reach many, while creators of products based on tangible goods often have to purchase the underlying goods in proportion to amount of product sold in the derivative market. Id. at 634. He concludes, however, that copyright's current derivative work right is too broad for allocative efficiency. Rather, the derivative work right should be limited to specific circumstances, and even in those circumstances the scope of the right should be limited essentially to verbatim or near-verbatim copying to insure that the original author cannot use it to reduce competition in the derivative works market below what is found in derivative use markets for works that are not works of authorship. Id. at 652-53. If copyright were indeed limited in this way, copyright protection for functional works might be much less of a problem, especially if an improvement is deemed to be noninfringing (such as non-verbatim copying). Given the actual, broad derivative work right under copyright law, however, this argument loses force if we are to choose today between current copyright law and current patent law for the protection of functional works. Nor is it clear how "ease of copying" as the distinction between patent and copyright subject matter is supported by this analysis. Many patents are quite easy to copy and put to use in competitive production. An analysis for patent similar to Professor Lunney's for copyright might well lead to a conclusion that we should reduce the scope of patent rights in the same way as he suggests for copyright. Were we to do so, we would be left the more basic question of whether patent or copyright is the more appropriate for functional works, after the scope of protection of each regime has been reduced to promote the kind of allocative efficiency for which Professor Lunney argues. It seems to me that the other arguments for patent over copyright would remain valid.
83 I could not agree more with Professor Lunney's analysis of the legislative process, where he concludes copyright law has come to provide excess protection as a result of the ability of the beneficiaries of strong copyrights to organize and lobby, at the expense of the dispersed general public. I find the length of copyright protection appalling and have devoted an entire web site to opposing the recent extension by twenty years and further extensions. Opposing Copyright Extension, at http://www.law.asu.edu/HomePages/Karjala/OpposingCopyrightExtension (last visited Nov. 8, 2002)
C. Does Incremental Progress Require Copying?

Professor Lunney criticizes the reasoning of the First Circuit in *Lotus Development Corp. v. Borland International, Inc.* in justifying its exclusion of the Lotus menu command hierarchies from copyright coverage partially on the ground that the incremental nature of progress (in the sense of improvement or advancement) in technological fields requires giving later authors more copying leeway. It is important to distinguish what the Lo-
tus court said and the use of the notion of "incremental improvement" in this Article. Whatever the demerits of the reasoning in Lotus, the notion that "incremental progress requires copying" is not the argument offered in this article for distinguishing patent and copyright subject matter, except perhaps incidentally. The issue here is subject matter. Copyright subject matter gets protection, if at all, under the copyright regime. Patent subject matter gets protection, if at all, under the patent regime. Those regimes give, respectively, different types of protection, with a different scope, for different terms, and subject to different qualifications. The argument here is not that improvement through incremental development requires copying, although classification as patent subject matter may have the result that more copying will be permitted. Rather, it is that works of a type in which incremental development leads to socially desirable improvement should be considered patent subject matter. Whether any given work of that type is in fact protected by patent should be determined by the strict patent standards and not by the looser and more generous copyright standards.

D. Relative Suitability of Patent over Copyright for Functional Works

In addition to his affirmative rationale for distinguishing patent and copyright subject matter based on the respective practical differences involved in copying the creativity embodied in them, Professor Lunney explicitly rejects the following arguments for concluding that patent is better suited to the protection of useful articles than copyright: (1) that patent has higher standards and a shorter term; (2) that patent better responds to social desiderata concerning variety; and (3) that patent is more certain in defining infringement. Because this represents the only serious challenge of which I am aware to the proposition that patent is more suitable than copyright for functional works, it is worth considering his reasons.

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86 Lunney, supra note 72, at 2427-31; see also discussion supra notes 72-83 and accompanying text.

87 Id. at 2420 n.70. "[P]atents are more narrowly defined than copyrights, harder to get, persist for a shorter period, and are easier to defend against in cases of nonliteral copying." Relative Roles, supra note 10, at 45; see also discussion supra note 58 and accompanying text; A Coherent Theory, supra note 13, at 57 ("[P]atents are narrower than copyrights, harder to get, and persist for a shorter period"). These features, I believe, make patent more suitable for the protection of functional works than copyright.

88 In a private communication, Professor Malla Pollack has asked whether copyright's fair use limitation might make copyright more appropriate for the protection of functional works, in view of the absence of a fair use defense in patent law. Cf. Maureen A. O'Rourke, Toward a Doctrine of Fair Use in Patent Law, 100 COLUM. L. REV. 1177, 1249-50 (2000) (arguing for the adoption of a patent variation of copyright's fair use principle). If fair use were a reliable form of compulsory license, it could be an important counterweight to a copyright in functional works. Its use in this fashion, however, has little foundation other than a footnote in the Supreme Court's decision in Campbell. Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 578 n.10 (1994) (suggesting that courts might consider denying
Professor Lunney agrees that patent has higher standards for protection than copyright, especially in its nonobviousness requirement. This, he argues, only ensures that patents are awarded to inventions that are most creative, difficult, and valuable, which are the inventions that others will wish to license. The conclusion here is almost surely incorrect. That an improvement is "obvious" and therefore unpatentable says nothing about whether competitors will wish to incorporate the improvement into their own products. Indeed, if an improvement is worth the tool-up costs to its creator, it seems likely it would be worth at least as much to competitors, who may well find a way to further improve it as they do. It is that kind of incremental improvement for functional works, as opposed to the incremental "improvement" that comes from changing the ending of a popular novel, that justifies keeping functional works under patent law unless a good reason appears for doing otherwise.

Professor Lunney concedes that patent's shorter term has some persuasive force in application to functional works but argues that it is largely irrelevant to computer programs. His argument has some validity as applied to the First Circuit's reasoning in *Borland*, which involved a computer-program interface—although the uproar over Y2K suggests that many old computer programs are still in use. Moreover, the long-term

injunctive relief in close questions of fair use). Most improvements of functional works will aim at commercial markets, which points away from fair use under factor one of the fair use analysis (purpose and character of the use), although an improvement might also be said to be a productive use, which points in the other direction under that factor. Improved products would likely be sold in competition with the copyright owner's product, however, thus flunking factor four (the effect of the use on the market). 17 U.S.C. § 107 (2000). Fair use analysis is, therefore, as usual, inconclusive until ruled upon by a court, which alone acts as a heavy disincentive to tinkering. Perhaps even more important, courts inclined to treat given uses of functional works as "fair" already have solid grounds for denying copyright protection altogether under *Baker v. Selden* and § 102(b). The cases discussed in Part III show how courts reach for copyright because they feel some form of protection is necessary. There is therefore little reason to think that copyright's fair use principle will do even a good job, let alone a better job than patent, at supplying the freedom necessary for the flourishing of technological improvement.

99 Lunney, *supra* note 72, at 2420 n.70.

Moreover, even if the conclusion is correct and nonobvious inventions are indeed the only advances competitors desire to use, it says nothing about the relative unsuitability of patent law for useful articles. It means only that patent law is working as intended, by supplying an incentive for the creation of nonobvious technological advances that are desired by society. If these same nonobvious advances in functional works were protected by copyright, the need to license would extend for a much longer term (and even for obvious but original features as well). It therefore seems to me that copyright is less suitable for their protection.

91 In the case of computer program code, which is functional, Congress has made the determination that copyright should apply. This determination can be justified, provided that the scope of protection is properly limited, by the relative ease with which computer program code may be pirated. See discussion supra notes 43-50 and accompanying text. Another functional work whose copyright protectability might be justified on similar anti-misappropriation grounds is a set of psychological test questions designed to measure some human attribute. See discussion *infra* notes 300-13 and accompanying text.

92 Lunney, *supra* note 72, at 2420 n.70.
viability of any given aspect of software technology is likely to increase as the field matures.\textsuperscript{93} Going beyond computer programs to traditional useful articles, such as automobiles and electronic hardware, patent's shorter term is obviously more suitable.\textsuperscript{94} Otherwise, how can we explain the almost total absence in the literature and in legislative proposals of calls for increasing the patent term to something more akin to the copyright term?\textsuperscript{95}

I have argued in the past that “[w]e prefer to have one hundred different war novels than one hundred versions of WAR AND PEACE that differ only in their final chapter,” so that copyright's broad and long protection for novels “fulfills the [social] goal of recognizing the author’s creativity without unduly hindering later authors or depriving society of desirable works.”\textsuperscript{96} Professor Lunney interprets this as an argument aimed at satisfying consumer tastes for variety and, on that basis, rejects it as illogical.\textsuperscript{97}

This interpretation, however, misconceives the original argument. The

\textsuperscript{93} Perhaps even more important, the long term of copyright protection prevents third parties from further developing computer software that has been abandoned by its author in favor of a more “advanced” version. The author of a new version of a popular program obviously would like both new and old users to buy copies of the new version. Such authors almost invariably stop supporting older versions shortly after the introduction of a newer one, and after a while only the most technically sophisticated will be able to continue to use the old one in the ever changing environments in which programs are used (e.g., with new or different operating systems). Yet, not every new version of a program is viewed by all users as an improvement. I have long been a dedicated user of WordPerfect over Word, but I find that, for my purposes, the quality of the program has gone down since it hit its peak with WordPerfect 5.1 for DOS. If that version were now in the public domain, I feel confident that someone would have discovered the niche market for WordPerfect 5.1 users and upgraded it for use in the Windows environment without changing its features as much as its owner (Corel and its predecessors) did. As it is, a fine example of computer-use technology lies fallow, a technological “ghost town” that cannot be brought back to life because of long-lasting copyright rights in the technology. If the period of protection for computer programs were five to ten or perhaps even fifteen years, it would not be long before we would see real competition in the operating system market and enjoy the technological advances that flow from such competition. See Karjala, supra note 43, at 176 (arguing that incremental improvement of operating system software occurs more efficiently in an open system environment); Jonathan Zittrain, The Un-Microsoft Un-Remedy: Law Can Prevent the Problem That It Can’t Patch Later, 31 CONN. L. REV. 1361, 1372-74 (1999) (discussing the example of Windows 3.1 and arguing for limiting the copyright in operating software to five years).

\textsuperscript{94} See discussion supra note 59 and accompanying text.

\textsuperscript{95} Professor Lemley has suggested to me in a private communication that the answer lies in public choice theory—that is, patent owners are often also potential patent infringers and thus find themselves as both plaintiff and defendant at one time or another in patent litigation. If this is correct, it seems to suggest that the current patent term is roughly correct for the functional works that constitute patent subject matter. For example, if a longer term gave a return to patent owners that outweighed the costs to patent users and potential infringers, there should be a systematic lobbying bias pushing for a longer term.


\textsuperscript{97} Lunney, supra note 72, at 2420 n.70. The argument is that if consumers indeed do not want ten versions of War and Peace, intellectual property rights are unnecessary because there will be no incentive to create the new versions. Moreover, even if consumers do desire this sort of variety, intellectual property protection for the original that extends to the “improvements” should still be withheld unless it is necessary to ensure an appropriate incentive for the creation of the original.
goal is not to cater to or satisfy consumer tastes for variety. Rather, the novel is used to exemplify the underlying social policy goal of traditional copyright and patent law, which is to draw a balance between creation incentives (protection) on the one hand and freer use by both consumers and competitors (less protection) on the other. The argument concludes: "In the case of technological products we have drawn the social policy balance at a different point than for traditional works of authorship because we believe that to grant intellectual property rights in ordinary engineering advances would hinder the development of more and better products than it would encourage." 98 In other words, we as a society have already made the judgment that intellectual property protection for novels should extend to variations, either because this is an appropriate incentive or because it does not hinder very much the ongoing development of more novels. It is the overall social desirability for technological advance through incremental variation of functional works that makes patent law more suitable for their protection, precisely because patent draws the line to allow much more tinkering with the existing base than copyright. Whether copyright law has gotten its expansive scope of protection right is an important question. Given that expansive scope, however, the social need for advance by incremental development makes copyright generally much less suited to the protection of technology than patent.99

Finally, Professor Lunney deems false the notion that patent’s requirement for specific claiming of the invention provides more certainty in determining infringement. 100 In support of this assertion, however, he quotes from a single Federal Circuit case labeling as “utopian," by reference to the doctrine of equivalents, the belief that a copier should be able to look at the patent claims to know whether her activity infringes. 101 Again, however, even accepting this statement as accurately summarizing this aspect of patent law, it says nothing about the relative degree of certainty between patent and copyright. Although the notion of an “equivalent” does add uncertainty in determining the allowable course of action for second comers, even the doctrine of equivalents is applied on an element-by-

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98 Karjala & Menell, supra note 96, at 185.
99 Computer software, of course, stands as a challenge to this statement. Much computer software represents routine, if time-consuming and skill-requiring, applications of well understood principles of computer programming, which makes the technology “obvious” under the patent standards. Copyright, therefore, has been enlisted to protect the skill, effort, and money that goes into the production of computer programs. Copyright’s long term of protection remains troublesome, but as between patent and copyright, only the latter is capable of protecting programs generally from cheap and easy copying and redistribution. That we have chosen to use copyright to protect program code, however, should not in itself lead us to apply copyright more generally to technology. See discussion supra notes 43-50 and accompanying text.
100 Lunney, supra note 72, at 2420 n.70.
101 Id. (citing Paper Converting Mach. Co. v. Magna-Graphics Corp., 745 F.2d 11, 19 (Fed. Cir. 1984)).
element basis, and the second comer is safe as long as his product does not adopt all of the elements, or their substantial equivalents, of a patent claim. Thus, the claims define, and limit, the scope of a patent, much more than copyright’s more general “substantial similarity” test for infringement. Let us return to the example of the automobile. Quite arguably, the modern automobiles of today are “substantially similar” to Henry Ford’s original Model T. If copyright protected the Model T (or the true “original” automobile, whoever came up with it) and if today’s copyright term were applicable, the copyright on that basic four-wheel structure would only recently have expired. That did not happen, because patent, and not copyright, was and is more suitable to the protection of technology.

103 We should also remember that while patent infringement requires that all claim elements be present in the accused product, copyright can be infringed when even a quantitatively small portion of the original is copied. Lemley, supra note 64, at 1083.
104 See discussion supra note 59 and accompanying text.
105 As another example, it is hard to imagine film production machinery or processes infringing a patent on book production machinery or processes, because the underlying patents for the latter will almost surely be tied to the different materials used to produce books as opposed to film. However, films would infringe book copyrights all the time unless used with permission. Relative Roles, supra note 10, at 45 n.8.

In a private communication, Professor Lemley has suggested consideration of the respective effect of regime choice on reverse engineering, which is often a productive form of copying. This could probably be the topic of an entire article, but perhaps a few words addressing the question are appropriate. The disclosure requirement of patent law, at least in principle, eliminates the need for reverse engineering of the invention itself. Disclosure not only permits those skilled in the art to practice the invention when the patent expires; it also supplies information to those seeking to invent around the patent. Reverse engineering is also of relatively little importance to most of the functional works considered in this Article, because the functional system or process in question is generally revealed in the copyright-protected work (such as a book or compilation) employing it. Still, copyright protection of function represents a danger for the kind of technological advance and economic competition that result from reverse engineering. Computer programs represent one of the few functional works that is expressly under copyright. See supra notes 43-50 and accompanying text. That copyright at least poses problems for reverse engineering becomes apparent from consideration of some of the software cases. In the United States, it seems now settled that reverse engineering of a computer program by decompilation will be a fair use if the purpose is to obtain copyright-unprotected information that is available in no other way. Sony Computer Entm’t Inc. v. Connectix Corp., 203 F.3d 596, 607-08 (9th Cir. 2000); Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510, 1518 (9th Cir. 1992). This litigation would have been wholly unnecessary absent a software copyright. In the European Union, moreover, fair use is not available in most member states, and reverse engineering is permitted only when effected for purposes of interoperability. 1991 O.J. (L 122) 42, 45. Litigation was also required to establish the right of a competitive software maker to offer the same functionality, even with improvements and with independently written code, as that of the dominant firm in the market. Lotus Dev. Corp. v. Borland Int’l, Inc., 49 F.3d 807, 809-12 (1st Cir. 1995), aff’d by an equally divided Court, 516 U.S. 233 (1996); see also Mitel, Inc. v. IQTel, Inc., 124 F.3d 1366, 1368-70 (10th Cir. 1997); discussion infra note 317. Most important, it appears essentially impossible to reverse engineer very complex programs to produce a fully compatible and noninfringing version. Otherwise we would likely already have some competition in the operating systems markets owned, respectively, by Microsoft’s Windows and Apple’s Macintosh.
E. The "Utility" Requirement of Patent Law

This last objection of Professor Lunney—that patent claims do not provide certainty in determining the bounds of the patent—does point up an aspect of patent law that may need more attention if all functional systems and processes, like business methods, are to be considered patent subject matter. A number of commentators have lamented the U.S. Patent and Trademark Office's ("PTO") issuing of patents that seemed obvious, and some have suggested ways by which the PTO and the courts can put more teeth into the nonobviousness requirement. Less attention has been paid to patent's utility requirement and to the requirement that the specification both distinctly claim the invention and enable one skilled in the art to practice it. An important exception is Professor Chiappetta, who has strongly advocated "practical utility" as crucial to the patentability determination. "Practical utility" requires an objective determination that the invention has been implemented, that the implementation achieves "specific utility" (that is, it does what its inventor claims it does), and that the implementation causes the result claimed. He treats the requirement of objective verifiability as a patent subject matter limitation, but it is important to note that a requirement of objective verifiability does not go to the general type of invention but rather to its quality. It seems reasonable, therefore, to fold the practical utility requirement into the subject matter exclusion for abstract ideas, in the sense that if the specified utility cannot be objectively demonstrated to result from the claimed invention, the in-

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106 E.g., Dreyfuss, supra note 19, at 278-79; Kasdan, supra note 20, at 160; Raskind, supra note 19, at 66; Stern, supra note 20, at 142; Thomas, supra note 17, at 29-30.
107 E.g., Bagley, supra note 20, at 265-77 (applying the doctrine of analogous prior art where traditional references are unavailable); Chiappetta, supra note 18, at 351-52 (emphasizing that the greater interconnectivity in the competitive arts makes it more obvious to combine references from a substantial range of businesses and that nonobviousness should rarely be predicated on implementing an existing business technique on a computer or for the Internet); Ron Laurie & Robert Beyers, The Patentability of Internet Business Methods: A Systematic Approach to Evaluating Obviousness, in COPYRIGHTS: THE FUTURE OF INTELLECTUAL PROPERTY IN THE INFORMATION AGE 237 (Adam Thierer & Clyde Wayne Crews, Jr. eds., 2002) (offering a "claims taxonomy" and a "problem-solving spectrum" as an analytical model for determining obviousness). But see Lunney, supra note 39, at 370-94 (demonstrating that the Federal Circuit has actually been loosening the nonobviousness requirement rather than tightening it).
108 See, e.g., Thomas, supra note 17, at 26 (noting that the utility requirement has always been minimal).
110 State Street Bank emphasized that the essence of patent subject matter is its "practical utility." State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1375 (Fed. Cir. 1998).
111 Chiappetta, supra note 18, at 313-14 & n.134.
112 Id. at 313.
113 Id. Professor Chiappetta's analysis refers to Professor Thomas's observation that many endeavors, such as dance steps or sports moves, lack objective mechanisms for evaluating the other requirements for patentability. Thomas, supra note 17, at 54.
vention should be treated as an unpatentable abstract idea. In any event, I see no objection to, and indeed fully support, Professor Chiappetta's suggestion that the PTO and the courts require a clear demonstration of actual utility before awarding or validating a patent.\textsuperscript{114}

F. Summary

"Functionality," it must be admitted, is not wholly successful at describing the historical distinctions we have made between patent and copyright subject matter,\textsuperscript{115} although I believe it does describe the distinctions as well as any single concept can. Its importance lies not in its descriptive power but rather in the normative analytical generality that allows it to be applied to a number of troublesome works, without forcing many changes in established principles. The remainder of this Article applies the "incremental improbability" concept to business methods, legal forms, methods of presenting information, taxonomies, and other functional systems and methodologies to argue that patent, strictly construed, is generally a socially more desirable means of protecting such subject matters than copyright.

III. Methodologies for Collecting, Arranging, Organizing, or Using Information

It smacks of heresy to suggest, as I have above,\textsuperscript{116} that the only "arrangements" of information that should be treated as copyright subject matter are those whose appeal lies wholly in the aesthetic appearance of the arrangement or are chosen out of the wholly subjective judgment of the arranger. Indeed, with Feist's rejection of the "sweat of the brow" approach to the copyright protection of compilations, all that is left would seem to be creative selection, organization, or arrangement.\textsuperscript{117} Still, while Feist does hold that creative selection or arrangement is a necessary condition for copyright protection of a compilation,\textsuperscript{118} it does not say, and indeed

\textsuperscript{114} Chiappetta, \textit{supra} note 18, at 352.

\textsuperscript{115} I believe it is correct to say that copyright, in the main, has eschewed the protection of "functionality" under my definition. However, standardized tests are functional under this definition and are routinely held copyright-protected. Applied Innovations, Inc. \textit{v.} Regents of the Univ. of Minn., 876 F.2d 626, 635-36 (8th Cir. 1989); Educational Testing Serv. \textit{v.} Katzman, 793 F.2d 533, 543 (3d Cir. 1986); Educational Testing Serv. \textit{v.} Simon, 95 F. Supp. 2d 1081, 1088-89 (C.D. Cal. 1999); see also discussion \textit{infra} notes 300-13 and accompanying text. Other functional works have occasionally fallen through the cracks into copyright protection as well. See \textit{generally} A Coherent Theory, \textit{supra} note 13, at 63-65 & n.36.

\textsuperscript{116} See discussion \textit{supra} text following note 71.


\textsuperscript{118} Feist, 499 U.S. at 360.
cannot mean, that such creativity is a sufficient condition. *Feist* simply does not deal with the other limitations on copyright protection beyond the originality and authorship requirements—limitations such as § 102(b).119 This Part of the Article undertakes a detailed analysis of copyright protection for various creative methodologies relating to the delivery of information, taking all of the copyright limitations into consideration. It concludes, in most cases, that treating these methodologies as patent subject matter, while not without difficulties, makes more sense than treating them as copyright subject matter.120

A. Accounting Systems

*Feist* dealt with a traditional compilation of facts—a telephone directory—and concluded that some minimal creativity in selection or arrangement of the contents was necessary before copyright protection would attach. That creative selection or arrangement of a work’s elements cannot be sufficient for copyright to attach is clear if we consider methods for organizing and combining information that do not result in a factual compilation. An accounting system is one example. In *Baker v. Selden*,121 the Supreme Court held that the copyright in a book describing an original—and surely creative under the low threshold of *Feist*122—new system for

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119 The Court did perhaps contribute to this misunderstanding when it said that “copyright protection may extend only to those components of a work that are original to the author.” *Id.* at 348. Here the Court was pointing out that not every element in a work is protected and that facts, as unoriginal, can be protected only through original selection or arrangement. It did not mean, nor could it have meant, that nonoriginality was the only limit on copyright protectability. An “idea” is an element of a work that may well be original to the author, yet it is not protected by the copyright. Indeed, *Feist* itself refers to the “fact/expression dichotomy” together with the “idea/expression” dichotomy explicitly contained in § 102(b), stating that copyright “encourages others to build freely upon the ideas and information conveyed by a work.” *Id.* at 350. Nothing in *Feist* suggests that ideas are unprotected simply because they are unoriginal. Moreover, the *Feist* opinion itself does not fully work through the implications of its exclusion of facts from copyright protection. The notion that facts are merely “discovered” and therefore owe their origin to no act of authorship simply cannot be sustained. See Wendy J. Gordon, *Reality as Artifact: From Feist to Fair Use*, 55 Law & Contemp. Probs. 93, 93-96, 105 (1992) (pointing out the error in treating all facts as merely “discovered” rather than “created” and arguing that freedom to use facts should not depend on their “uncreated” status); Pamela Samuelson, *The Originality Standard for Literary Works Under U.S. Copyright Law*, 42 Am. J. Comp. L. 393, 399 (1994) (discussing the difficulties of the “discovery” rationale for denying copyright protection to facts); see also discussion infra notes 150-55 and accompanying text (discussing creatively determined “factual” information).

120 *Sui generis* alternatives to patent and copyright will arguably be a better choice than either of the two major paradigms, at least in some cases. See discussion supra note 9 and accompanying text. This Article addresses only the relative merits of patent and copyright as the major default choices.

121 101 U.S. 99 (1879).

122 *Feist Publs*, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 345 (1990) (stating that “the requisite level of creativity is extremely low; even a slight amount will suffice”).
doing double-entry bookkeeping covered only the words used by the book author to describe the system and did not extend to the system itself.\textsuperscript{123} The Court could not have been clearer that such a system was the subject matter of patent, stating that "[t]o give to the author of the book an exclusive property in the art described therein, when no examination of its novelty has ever been officially made, would be a surprise and a fraud upon the public. That is the province of letters-patent, not of copyright."\textsuperscript{124}

In the context of accounting systems, this reasoning makes perfect sense. Double-entry accounting systems date back to Luca Paciola's innovation in 1494\textsuperscript{125} and had thus been evolving for nearly 400 years before Selden developed his particular variation. We may assume that Paciola's innovation was both novel at the time and "nonobvious" in today's sense of that term under patent law. Selden's improvement, too, may have been a patentable improvement. In either case, during the patent term, the inventor would have been able to demand licensing fees from anyone else who practiced, or even taught, the system. Given patent's purpose of encouraging the creation and disclosure of useful inventions, it is difficult to think of a good reason for denying either of these two hypothetical inventors their patents, and the exclusive rights that go with them, for the relatively short term of patent protection. Double-entry bookkeeping may not quite be to accounting what the wheel and other simple machines were to the mechanical arts, but in view of its continued application over many centuries, no one can doubt its usefulness or importance.

Let us assume that Selden's advance in double-entry bookkeeping was such an improvement over the existing methods that, once his system was made public, everyone recognized its advantages and, as a practical matter, found that they could simply not continue to use their old methods and still compete with others who were licensing Selden's system. This situation would give Selden a complete "stranglehold" over the business of accounting for the period of the patent. As a practical matter, no one would be able to practice the art of accounting without paying tribute to Selden. That a particular invention is so powerful, however, is hardly a ground for excluding it on subject matter grounds.\textsuperscript{126} For example, suppose that, in-

\textsuperscript{123} Baker, 101 U.S. at 107. It did not even extend to the blank forms—graphic works—that were incidental to, but necessary for, the operation of the system.

\textsuperscript{124} Id. at 102. Professor Lemley has pointed out to me in a private communication that the Court may have been somewhat disingenuous here, because patent law at that time did not protect accounting systems. But the basic point is clear and correct: Patent, and not copyright, is the regime that determines whether to protect such systems and, if so, to what extent.

\textsuperscript{125} Karjala & Menell, supra note 96, at 187.

\textsuperscript{126} Richard Stern has suggested that these circumstances call for treating Selden's patented system by analogy to copyright's "scènes à faire" doctrine and exempting it from patent coverage, but he is clear that this approach to limiting the effect of the patent does not exclude the system as patent subject matter. Stern, supra note 20, at 153.
stead of an improved accounting system, Selden had somehow invented a new calculating machine that used the mechanical technology of the age to automate the bookkeeping process. Even if this new machine were so fast, easy, and accurate that, as a practical matter one could not engage successfully in the business of accounting without using it, no one would deny the machine’s status as patent subject matter. Patent law is intended to induce and reward inventions that produce improvements in the way we go about our personal and business lives.

To have allowed Selden’s system to fall under copyright’s broad scope, and long term, in any event, would likely have stultified development of accounting systems. Copyright’s standard of originality is much lower, at least in principle, than patent’s requirement of nonobviousness. If we take Pacioli as the base, any other minor improvement of Pacioli’s system would itself have been copyright-protectable, even if it was “obvious” in the sense of patent and therefore ineligible for patent protection. As improvements continued to be found by later innovators, the accounting world might easily have found itself in an “anticommons,” in which the most efficient system was one in which hundreds of minor improvers owned copyrights covering individual pieces.

It is, of course, true that excluding something from copyright does not make it patent subject matter. On the other hand, in recent years courts have increasingly demonstrated a belief that the fruits of creative intellectual labor should, in one way or another, be legally protected by some-

127 On what is meant by the “broad scope” of copyright relative to patent, see discussion supra note 40.
128 I am avoiding here some of the gory detail of current copyright law that would complicate things but would not, I think, change the basic point. For example, current copyright law gives the copyright owner an exclusive right to prepare derivative works. 17 U.S.C. § 106(2) (2000). Selden’s innovation would have been a derivative work, based on what we may assume was a public domain base from Pacioli. Selden’s assumed copyright would have covered whatever additions Selden had made to the existing base. Id. § 103(b) (“[C]opyright in a . . . derivative work extends only to the material contributed by the author of such work, as distinguished from the preexisting material employed in the work”). If Selden’s system was a major improvement, no copyright would have been available to any improvers upon Selden’s system unless they made their contributions with Selden’s permission. Id. § 103(a) (“[P]rotection for a work employing preexisting material in which copyright subsists does not extend to any part of the work in which such material has been used unlawfully”). In that sense, Selden’s copyright would have been “dominant,” and Selden would have had the power to demand that each improver license from Selden, giving him the right to coordinate all improvement efforts. In that case, the “anticommons” might have been less unwieldy or even nonexistent. Still, one must ask whether incremental improvement would have occurred as rapidly or to the same extent if each improver knew that Selden was in a position to extract a toll from each increment for the long term of copyright. Moreover, as with the hypo in the text (where Selden is a minor improver), a “dominant” copyright owner will not necessarily be involved in every field involving functional methodologies. There might simply be a large number of small improvers on the public domain.
129 Stern, supra note 20, at 153.
thing. When a method of presenting or organizing information is taken, for the purpose of creating a competitive work, from its description or use in an existing copyright-protected work, such as a book, form, or computer program, it is particularly tempting for a court to expand the scope of copyright in the underlying work to the creative method or system of presenting the information. Maintaining Baker v. Selden’s distinction between the copyright-protected verbal description of the system and the copyright-unprotected system itself is crucial for keeping balance in the intellectual property system as a whole. Treating accounting systems as patent subject matter, with strict scrutiny of the patent requirements, eases the pressure on courts to cover them with copyright.

B. Maps and Mapmaking

Maps have been protected by copyright in the United States from the

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In the last twenty years the restitutionary impulse has acquired new force . . . . I speculate that judges may feel no need to examine the trend because the restitutionary notion that one deserves to keep the ‘fruits of his labor’ seems so evidently correct . . . that giving legal protection to intellectual products appears to require no special justification.

Id; see also New Protectionism, supra note 15, at 35 (speculating that the then-prevailing broad scope of software protection was based on judicial notions of the software industry as the last bastion of American technological superiority, so that the ease of copying software necessitated strong legal protection). But see Briggs v. N.H. Trotting & Breeding Ass'n, Inc., 191 F. Supp. 234 (D.N.H. 1960), discussed supra note 33. Professor Weinreb has suggested to me in a private communication that the unstated judicial motivation for this trend is not restitution but rather a more primitive notion that anything of value must be definitively owned. Once something is seen as “owned,” that is, as “property,” any unauthorized use is easily labeled “piracy.” If this explanation is correct, it means the courts are not recognizing the fundamental difference between tangible and intangible property: Tangible property invokes the “tragedy of the commons,” because one person’s use precludes that of another. See Dennis S. Karjala, The Term of Copyright, in GROWING PAINS: ADAPTING COPYRIGHT FOR LIBRARIES, EDUCATION AND SOCIETY 33, 43 (Laura N. Gasaway ed., 1997). However, the infinite and essentially costless multipliability of intellectual property (once created) eliminates the zero-sum game nature of tangible property and makes exclusive property rights economically inefficient after they are of sufficient strength to supply the necessary creation incentives. Id; see also Dennis S. Karjala, Statement of Copyright and Intellectual Property Law Professors in Opposition to H.R. 604, H.R. 2589, and S. 505, “The Copyright Term Extension Act” (submitted to the Committees on the Judiciary, United States Senate and United States House of Representatives, Jan. 28, 1998), available at http://www.law.asu.edu/HomePages/Karjala/OpposingCopyrightExtension/legmats/1998statement.html (last visited Nov. 9, 2002) (on file with the Connecticut Law Review); Sterk, supra note 41, at 1236 (“Giving authors property rights in their creations does not generate the economic advantages generally associated with Lockean theory, because intellectual property generates no potential for a tragedy of the commons.”). But see William M. Landes & Richard A. Posner, Indefinitely Renewable Copyright, U. CHI. JOHN M. OLIN LAW & ECONOMICS, Working Paper No. 154, at 11-15 (hypothesizing “congestion externalities” that effectively debase the value of public domain works). Whatever the underlying psychology, this Article will continue to use Professor Gordon’s phrase as a shorthand for the empirically observed judicial tendency to expand intellectual property rights where a gap in protection is perceived.
very first Congress.\textsuperscript{131} Because maps are simply pictorial representations of inherently factual information, however, their correct placement in the copyright firmament has been problematic since \textit{Feist} purported to rule out copyright protection for facts.\textsuperscript{132} Still, whatever level of protection copyright provides, few would argue that any specific map is protected by patent. A map supplies information to human beings, and information is quintessentially the subject matter of copyright.

Consider, however, methods of presenting geographic information. One very clear example is that of the contour map. I do not know who invented this method of portraying three-dimensional geographic information on a two-dimensional surface, or when it was accomplished, but let us assume that it has been only recently discovered and comes to general knowledge through the publication of a contour map of some specific mountains in a particular area. Assume that the particular map is protected by copyright. Does this copyright extend to the creative notion of depicting three dimensions by showing contour lines of given altitudes?

Most people, I believe, will respond that protection of the specific map does not extend to the general methodology of showing three-dimensional information by means of contour lines. It is denied protection as an “idea,” or as a “system,” or perhaps even as a “concept” or “principle.”\textsuperscript{133} But attaching any of those labels, without more, simply assumes the conclusion. The question is, \textit{why} do we treat this as an unprotected, although readily identifiable and even appropriable, element of the protected work? The methodology does, after all, aim at supplying information to human beings in an easy-to-understand, user-friendly way. Once one becomes accustomed to reading such a map, it supplies information that is much more rapidly digested and applied to the task of the user than, say, a table showing the altitudes of the ground at various geographical positions. But this is precisely the point. Contour maps represent one (perhaps rather large) step in the incremental development of that aspect of cartography concerned with making maps that are both accurate and easy to understand and use. Copyright subsists for too long a period to allow such incremental developments in methodologies for communicating with humans (as opposed to the substance of communications to humans) to remain under the control of their first discoverer or inventor.

Refusal to protect methodologies of presenting information in maps goes back a long way, at least to the Supreme Court’s 1878 decision in

\textsuperscript{131} The Copyright Act of 1790 protected “any map, chart, book or books.” Copyright Act of 1790, § 1, 1 Stat. 124, 124 (1790).


\textsuperscript{133} See 17 U.S.C. § 102(b) (2000) (providing that copyright protection does not extend to ideas, systems, concepts, or principles).
Perris v. Hexamer,\textsuperscript{134} holding that symbols used to designate objects of interest on a map are not copyright protectable.\textsuperscript{135} In Perris, plaintiff made a series of maps for New York City, for use by fire insurance companies. A key explained the "arbitrary coloring and signs" used to depict the general characteristics of the different buildings shown on each map so that the insurer could "see at a glance" information needed for use in the insurance business.\textsuperscript{136} Defendant made a similar series of maps for the city of Philadelphia, adopting "substantially the same system of coloring and signs, and consequently substantially the same key" as used in plaintiff's maps.\textsuperscript{137} The Court concluded: "[W]e think it has never been supposed that a simple copyright of the map gave the publisher an exclusive right to the use upon other maps of the particular signs and key which he saw fit to adopt for the purposes of his delineations."\textsuperscript{138} Perris would seem to imply that a methodology like contour mapping, too, would lie outside of copyright protection.

That the defendant in Perris made maps of a completely different city makes the case easier, because it necessarily means that no detailed copying of plaintiff's actual maps could have been involved. But the result should be no different had the defendant, without copying anything from plaintiff's maps except for the depiction key and its colors, created a series of maps for New York that were substantially identical to those of the plaintiff. If plaintiff's copyright does not afford the right to monopolize the system of colors and keys generally, why should the plaintiff have the right to monopolize those systemic factors just for New York? There is real value in allowing later mapmakers to try their own independent hand at making new maps, because the result verifies much of what was correct in the first map and might correct errors that were present.\textsuperscript{139} There is also real value in giving map users some consistency in the symbols and keys used for similar maps, so that they can use maps from various sources without retraining their thought processes.

In the case of our contour map, it makes no sense to say that the inventor of the new methodology should have a long-term copyright monopoly in making contour maps of the particular area chosen for mapping but no others. For one thing, the inventor of the methodology might not make the

\textsuperscript{134} 99 U.S. 674 (1878).
\textsuperscript{135} Id. at 676.
\textsuperscript{136} Id. at 675.
\textsuperscript{137} Id.
\textsuperscript{138} Id. at 676; see also Streetwise Maps, Inc. v. Vandam, Inc., 159 F.3d 739, 747-48 (2d Cir. 1998) (using the same purple color to depict water and the same clarified white street grid did not infringe copyright in a map where the "total concept and feel" was otherwise different).
\textsuperscript{139} See Robert A. Gorman, Fact or Fancy? The Implications for Copyright, 29 J. COPYRIGHT SOC'Y U.S.A. 560, 570 (1982) (map copyrights are thin, but copiers should add value through verification, revision, or improvement of presentation).
most accurate maps, yet no one could improve upon her maps, even by independent surveying, without her permission. Moreover, if intellectual property protection for the methodology is deemed necessary as an incentive, we should be focusing on that methodology and applying the regime of protection that best meets the public interest in balancing creation incentives and free use. Restricting protection of the methodology to its application in a given geographical area seriously underprotects it, even if we assume that its creator will keep the methodology secret while she makes as many maps as possible of different geographical locations, publishing them all at the same time and claiming copyright protection in the method for all of them. There are bound to be vast portions of the world left to be mapped by others using the new methodology.

Before Feist, few would even have bothered to ask these questions—because by gathering its own facts the defendant necessarily invests time and money roughly equivalent to that expended by the plaintiff, which reduces if not eliminates the opportunity for defendant to undercut plaintiff's price. Assuming Feist applies to maps, the effort that goes into gathering the facts is now insufficient, standing alone, to justify copyright protection. The Fifth Circuit in *Mason v. Montgomery Data, Inc.*, however, was undeterred, finding sufficient originality for copyright protection in the "selection of sources, interpretation of those sources, discretion in reconciling inconsistencies . . . and skill and judgment in depicting the information." While copyright protection in *Mason* does not rest on creativity in presenting the information, as the contour map example does, it is based

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140 Professor Raskind might find infringement in the second map of the same area if the two maps are substantially similar (as seems likely if both cartographers are good). His rule is that infringement is avoided if and only if the second map is original, in terms of cartographic conduct, and more than a trivial variation of the preexisting work. Leo J. Raskind, The Continuing Process of Refining and Adapting Copyright Principles, 14 COLUM.-VLA J.L. & ARTS 125, 150 (1990).

141 On its facts, *Feist* deals solely with compilations, which were fully dealt with under the Court's interpretation of the statutory definition of a "compilation." Therefore, strictly speaking, the Court's excursion into the constitutional basis for "originality" and "authorship" was dictum. See *Electronic Maps*, supra note 132, at 412.

142 967 F.2d 135 (5th Cir. 1992).

143 Id. at 139.

144 *Rockford Map Publishers, Inc. v. Directory Servs. Co.*, 768 F.2d 145 (7th Cir. 1985), a pre-*Feist* case, also dealt with bare-bones real estate plat maps, like *Mason*. *Rockford Map* made no finding of creativity in the actual map, which consisted simply of lines showing the boundaries of improved parcels of land, together with information about the current record owners. However, it came a little closer to the ultimate presentation by finding that the copyright covered the act of "translation from dusty books of legal jargon to a picture." *Id.* at 149. Similarly, a federal district court, in an opinion subsequently withdrawn and vacated, concluded that the requisite creativity could be found in deciding how detailed the map was to be, whether to include unnamed roads, the color scheme, and similar items. *Alexandria Drafting Co. v. Amsterdam*, 43 U.S.P.Q.2d 1247, 1253 (E.D. Pa. 1997). That court concluded that while there may be creativity in activities like aligning streets and subdivisions or in the exact placement of a symbol on the map, the creativity is fundamentally inadvertent, because the car-
on the creative methodology for gathering the information and thereby raises the question of whether that methodology is protected by an assumed copyright in the maps. Reasoning by analogy to the contour map methodology, we should conclude that procedures for gathering information are no more protected than procedures for presenting information.\textsuperscript{145} This means that, under \textit{Feist}, creativity is necessary for copyright in the resulting product (the map), but the copyright in the map does not protect that creativity. In other words, \textit{Mason} divorses the scope of protection in a map from the creativity judged necessary for copyright to attach in the first place.\textsuperscript{146}

The point here is not to rehash the quandary for map protection that \textit{Feist} has created.\textsuperscript{147} It is rather to show how the "restitutionary impulses" of the courts\textsuperscript{148} cause them to manipulate copyright to trench on the subject matter of patent. In \textit{Mason}, the court bases copyright protection on a finding of creativity in the process of gathering information rather than in the final product comprising the collected information itself. That processes are patent subject matter excluded from copyright under § 102(b) could be ignored in \textit{Mason} by focusing on the end product, which on its face evinced none of the creativity that went into making it. Where the creativity is in the methodologies of the presentation itself, however, it is very

tographer's goal is to portray the actual facts and not have them stray from geographical reality. \textit{Id.} at 1253-54.

\textsuperscript{145} Indeed, because copyright works aim at delivering information to human consumers, creative methods of presenting information offer a stronger case for copyright protection than creative methods of gathering information (research). \textit{Sparaco v. Lawler, Matusky, Skelly Engineers, LLP,} 60 F. Supp. 2d 247, 252 (S.D.N.Y. 1999), stated unequivocally that elevation measurements used to develop land contours on a building site plan are not copyright protectable. \textit{Sparaco,} 60 F. Supp. at 252. In a later opinion, the district court relied on \textit{Attia v. Society of the New York Hospital,} 201 F.3d 50 (2d Cir. 1999), to conclude that the siting of the building and adjacent features as well as the resulting displacement contours were unprotected generalized conceptions. \textit{Sparaco v. Lawler, Matusky, Skelly Engineers, LLP,} No. 97 Civ. 6720 (S.D.N.Y. 2000). The Second Circuit, however, reversed this holding on appeal, concluding that the plan was capable of being used to guide actual site preparation work by including a very specific building footprint; details concerning parking, drives, curbs, and walkways; displacement contours and elevation measurements; landscaping details, and more. \textit{Sparaco v. Lawler, Matusky, Skelly Engineers, LLP,} 303 F.2d 460, 468-69 (2d Cir. 2002). Looking for specific detail in a site plan, however, is equivalent to treating only merger as a limitation on copyright protection. This approach ignores the other limitations on copyright, especially those of § 102(b) and the functionality doctrine of \textit{Baker v. Selden.} See infra notes 186-206 and accompanying text. Many of the plan features cited by the court are functional. While it is proper to recognize copyright in the site plan as a whole, just as we would do for a map, protection should be limited to verbatim or near-verbatim copying. In particular, an independently drawn plan that included the same functional elements in the same relation to one another should not be deemed infringing. To do otherwise would draw copyright improperly into the realm of patent.

\textsuperscript{146} \textit{Electronic Maps, supra} note 132, at 401-04.

\textsuperscript{147} This entire question is discussed at length in \textit{Electronic Maps, supra} note 132, at 395-406.

\textsuperscript{148} See discussion supra note 130.
difficult for courts not to protect the creativity that they have found: If creativity is necessary for copyright protection, how can we protect the work but not the creativity that leads to protection? 149 Subsequent sections show a strong tendency of copyright courts to protect creative but functional methodologies, either as an element of the underlying protected work (such as a compilation or textbook) or as free-standing copyright subject matter (such as a taxonomy).

C. Created "Facts" and Valuations

The legal boundary between two contiguous pieces of property is a fact about which different surveyors or mapmakers might reach slightly different conclusions (because they use different methodologies or apply the same methodology somewhat differently). The "fair market value" of a piece of real or personal property is a fact about which different experts will almost certainly reach different conclusions, and conclusions that are more than slightly different. Because of the wide dispersion in results reached by independent experts in fair market value cases, some courts have treated such fact estimates more like subjective opinions in concluding that the estimates themselves, numerical though they may appear, are protected by the copyright in the work in which the estimate is reported. 150 These decisions show the lengths to which courts will go in order to avoid what they view as misappropriation of another's investment of time or labor theoretically rendered permissible by Feist.

Fair market value is the ultimate legal "fact." It is classically an issue for the jury if there is one. Difficulties in determining fair market value accurately make it wise for the legal system to avoid the need to make such determinations whenever possible, but in many cases there simply is no

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149 In Lotus Development Corp. v. Paperback Software International, 740 F. Supp. 37 (D. Mass. 1990), Judge Keeton rejected defendant's argument that standardization concerns could justify denying copyright protection to the user interface because that would result in denying protection to the most innovative part of the program. Lotus, 740 F. Supp. at 79. The same reasoning would apply to the first contour map, the most innovative part of which was its new methodology for presenting information. Not all courts, of course, have fallen into this error. For example, the en banc Eleventh Circuit has held, over a strong dissent, that neither techniques for the discovery of facts nor their resourceful, efficient, or creative collection is copyright protectable. BellSouth Adver. & Publ'g Corp. v. Donnelley Info. Publ'g, Inc., 999 F.2d 1436, 1441 (11th Cir. 1993) (en banc) ("[T]he district court erred by extending copyright protection to the collection of facts in the . . . directory based on the uncopyrightable formative acts used to generate those listings."); see also discussion infra notes 224-27 and accompanying text. Still, subsequent sections show that the protection of maps is not the only area of copyright in which this approach to the "creativity" required by Feist has been adopted.

choice.\textsuperscript{151} Fair market value is the price at which a willing buyer and a willing seller will agree to the transaction and, in principle, there is a single answer to the question. Indeed, the law consistently assumes that a single answer to the question exists, even while recognizing that different experts will disagree about what that single value is.

The valuation problem is similar to the reconstruction of ancient texts, like the Dead Sea Scrolls, from the bits and pieces of the original manuscripts that are now available for scholars to study.\textsuperscript{152} Although much creative thought and deep knowledge is required to make even an educated guess at what the original actually said, and although we may therefore concede that different scholars working independently would very likely come up with different arrangements of the bits and pieces that are extant, the goal is not to produce the arrangement that gives the most aesthetically pleasing text. Rather, the goal of each such scholar is to reproduce as exactly as possible what was originally written.\textsuperscript{153} If a particular arrangement of the bits and pieces is protected by copyright, research to reconstruct the original could grind to a halt, because later scholars arguing for small variations (incremental improvements)\textsuperscript{154} would still be presenting a product that is substantially similar to the copyright-protected version and therefore could not do so without the permission of that version’s “author.”

This same reasoning applies to almost any fact, including so-called “scientific facts.” The distance from the earth to the moon at any given time or the speed of light in vacuum may be measured differently by different teams of scientists using different equipment, but surely that would not make any given measurement merely a subjective estimate that is entitled to copyright protection. This remains the case even though each

\textsuperscript{151} For example, income tax law requires that the fair market value of goods or services received in exchange for labor be included in income at fair market value. Without such a rule it would be too easy for some people to barter their services for consumables, and after consumption the income would never be subject to taxation. Even if the recipients were to hold the goods received for services as investments, failure to assess tax at the time of receipt would allow the worker to delay tax payments until sale. See 26 U.S.C. § 61 (2000) (“[G]ross income means all income from whatever source derived”). Similarly, privately held companies must be valued when some shareholders’ interests are bought out at a “fair price” or when a dissenting shareholder exercises appraisal rights in a merger.

\textsuperscript{152} For a fascinating study and analysis of the history and law surrounding the Dead Sea Scrolls, see David Nimmer, Copyright in the Dead Sea Scrolls:Authorship and Originality, 38 Hous. L. Rev. 1 (2001).

\textsuperscript{153} See id. at 105-15 (discussing copyright and the scholarly reproduction of historical texts).

\textsuperscript{154} That “incremental improbability” here is a policy reason for denying copyright protection does not mean that the end product should be patentable. See discussion supra note 65 (discussing incremental improbability as the policy basis for denying copyright protection to facts). As discussed above, patent has never been concerned with information as such. See discussion supra notes 69-71 and accompanying text. Nothing in this Article advocates involving patent directly in the protection of information, as opposed to methods of gathering, organizing, or presenting information.
measurement requires much skill and creative thought and planning.\textsuperscript{155} Any given measurement adds to the existing base of knowledge and allows further refinements to pin the ever-elusive "fact" down more closely.

In \textit{CCC Information Services, Inc. v. Maclean Hunter Market Reports, Inc.},\textsuperscript{156} the Second Circuit found copyright originality in estimated values for used cars on the ground that the numbers represented predictions of future prices in various geographical areas, based on a multitude of information sources as well as the exercise of professional judgment and expertise.\textsuperscript{157} If we were to accept this reasoning at face value, we would have to conclude that copyright extends not just to the compendium as a whole but also to each of the individual value estimates included therein.\textsuperscript{158} For the reasons given above, these estimates are attempts to state facts. That different experts would come up with different answers in practice does not change the nature of the problem. In principle, there is only one answer for the average value of a particular car within any of the categories chosen.

In \textit{CDN Inc. v. Kapes},\textsuperscript{159} the Ninth Circuit took \textit{CCC} one step further. There the parties stipulated that the sole issue in the case was the copyright-protectibility of estimates of wholesale prices for collectible coins, so the question of plaintiff's creativity in selecting or arranging the compilation of price estimates was irrelevant.\textsuperscript{160} Concluding that plaintiff's process

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\textsuperscript{156} 44 F.3d 61 (2d Cir. 1994). See \textit{Electronic Maps, supra} note 132, at 407-11 for further discussion of \textit{CCC Information Services}.
\textsuperscript{157} \textit{CCC Info. Servs.}, 44 F.3d at 66-67. The court also found copyright originality in decisions concerning the type of information to supply, such as boundaries of geographical regions, mileage breakpoints, and choices concerning optional features, notwithstanding that these choices were logical responses to the needs of the market. \textit{Id.} at 67-68. This aspect of the case is disclosed below along with other method-of-presentation cases. See discussion \textit{infra} note 211.
\textsuperscript{158} That we might not take it at face value is suggested by the court's handling of the infringement issue. There the court emphasized that the taking was "of virtually the entire compendium." \textit{CCC Info. Servs.}, 44 F.3d at 72. The court also stated: "[I]t is of consequence that we are confronted with wholesale copying of a compilation rather than some more limited copying from a compilation." \textit{Id.} at 72 n.26 (emphasis in original). Thus, the court was really returning to the old "sweat of the brow" approach to the protection of compilations, quite contrary to \textit{Feist. Electronic Maps, supra} note 132, at 410-11.
\textsuperscript{159} 197 F.3d 1256, 1260 (9th Cir. 1999).
\textsuperscript{160} \textit{Id.} at 1258-59. The stipulation was a major tactical error on the part of defendant's counsel. The complaint alleged that defendant "infringed [plaintiff's] copyrights by using [plaintiff's] wholesale prices as a baseline to arrive at retail prices," and while defendant admitted using plaintiff's price lists, the exact process used by defendant was not made clear to the court. \textit{Id.} at 1257-58. If, indeed, defendant simply started from plaintiff's wholesale prices and added additional information to arrive at his own estimates of retail value, we would see almost a classic example of the "incremental improvement" intellectual property law seeks to promote. One of the main reasons we do not protect facts is that they form the building blocks for the discovery of new facts and theories. See, e.g., \textit{Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.}, 499 U.S. 340, 349-50 (1991) ("[C]opyright assures authors the right to their

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of determining coin prices was creative, the court found that each price
was a compilation representing plaintiff’s best estimate of value. This is
a very expansive interpretation of the statutory definition of “compilation”
as a “work formed by the collection and assembling of preexisting materi-
als or of data that are selected, coordinated, or arranged in such a way
that the resulting work as a whole constitutes an original work of authorship.”

What, for example, were the preexisting materials or data that were put
together to form a given estimate of value? In fact, there is nothing that
is put together through the exercise of creative judgment that would not be
a “compilation” under this approach. An automobile represents a creative
selection and arrangement of many parts, in this case identifiably preexist-
ing “materials.” The absurdity of treating an automobile as a copyright-
protectible compilation needs no further elaboration, no matter how much
creativity goes into its design (selection and arrangement of parts). It is
evident that CDN simply uses anti-misappropriation notions to force the
defendant to do its own work in determining the value estimates rather than
to protect the creative selection or arrangement of compiled data, paying
only lip service to Feist’s elimination of the “sweat of the brow” basis for
copyright originality.

Creativity in the process of determining some useful number or param-
eter has been the basis for finding copyright protection in several other
cases. Courts have protected numerical parameters useful in generating
prefailure warnings for computer hard drives, data about composite

original expression, but encourages others to build freely upon the ideas and information conveyed by a
work”).

161 CDN Inc., 197 F.3d at 1260. The court described the process as examining major coin publica-
tions, reviewing the data for accuracy, determining whether a coin was graded by a professional
service and which one, reviewing online networks for bid and asked prices by dealers, and extrapola-
ting from these prices to arrive at prices for unreported coins, while considering also the impact of
auctions and private sales as well as the effect of the economy and foreign policy. Id.


163 In fact, the court actually stated that plaintiff’s process in CDN was “not a process through
which they discover a preexisting historical fact.” CDN Inc., 197 F.3d at 1261. Surely, plaintiff’s
various judgment calls in determining, for example, the reliability of the underlying data are not
“facts,” nor are they “preexisting materials.”

164 See discussion infra note 182.

165 See Neil Weinstock Netanel, From the Dead Sea Scrolls to the Digital Millennium; Recent
Developments in Copyright Law, 9 TEX. INTELL. PROP. L.J. 19, 56 (2000) (stating that the Ninth Cir-
cuit in CDN Inc. “pushed copyright in the direction of a general misappropriation statute”).

166 See CDN Inc., 197 F.3d at 1260.

1995). This case is reminiscent of the district court’s decision in Gates Rubber Co. v. Bando American,
Inc., 798 F. Supp. 1499, 1519, 1522 (D. Colo. 1992), which held that mathematical constants developed
for use in public domain mathematical formulas to determine replacement needs in plaintiff’s unique
system of industrial belts were protected by copyright. This aspect of the analysis was properly disap-
proved by the Tenth Circuit on appeal (while upholding a finding of trade secret infringement). Gates
flooring materials generated from independent testing,\textsuperscript{168} and numbers representing cost estimates contained in schedules used by state real-property tax assessors,\textsuperscript{169} all on the basis of creativity in the process of deriving the numbers in question.\textsuperscript{170} These courts essentially turn Feist's creativity requirement from a necessary condition into one sufficient for copyright protection. If widely adopted, this approach would reduce Feist to a decision covering only white page telephone directories.\textsuperscript{171} Although these cases base copyright protectibility on creativity in the process of determining the numerical estimates or values, they do not purport to protect that creative process under copyright.\textsuperscript{172} Yet examination of the product of that proc-

\textsuperscript{168} E.g., Epic Metals Corp. v. Condec, Inc., 867 F. Supp. 1009, 1014 (M.D. Fla. 1994). In this case the defendants copied "substantial portions of plaintiff's brochures," including two photographs. Id. at 1013. This would have constituted more solid ground for a finding of copyright infringement.

\textsuperscript{169} E.g., Marshall & Swift v. BS & A Software, 871 F. Supp. 952, 954, 965 (W.D. Mich. 1994). Here, the court relied on the copyright act's definition of a literary work as one "expressed in words, numbers, or other verbal or numerical symbols or indicia . . . ." Id. at 962 (quoting 17 U.S.C. § 101 (2000)) (emphasis in Marshall & Swift). The court goes on to say that if plaintiff's numbers are unprotected as ideas, "it is difficult to comprehend under what circumstances a number may be protected." Id. at 962. The court thus failed to distinguish a work expressed in numbers (as, for example, computer program object code) from a single number.

\textsuperscript{170} Of course, not all courts take this approach. See, e.g., Shalom Baranes Assoc's. v. 900 F. St. Corp., 940 F. Supp. 1, 4 (D.D.C. 1996) (holding that columns of numbers representing "inside gross" and "total rentable" areas in a building are not copyright-protected, notwithstanding the expenditure of time and money needed to generate the numbers); Project Dev. Group, Inc. v. O.H. Materials Corp., 766 F. Supp. 1348, 1354 (W.D. Pa. 1991) (holding that "[e]stimates of scope of work, price and quantities in job bidding are all factual [and unprotected]"); Black's Guide Inc. v. Mediamerica Inc., 16 U.S.P.Q.2d 1769, 1771-72 (N.D. Cal. 1990) (holding that facts are unprotected, regardless of the effort expended in uncovering them, even if discovered by original research). The cases finding copyright protection for numbers seem to revive the pre-Feist case of Wainwright Secs., Inc. v. Wall St. Transcript Corp., 558 F.2d 91 (2d Cir. 1977). Wainwright involved defendant's putting the crucial conclusions of plaintiff's comprehensive research reports on companies into a newsletter, which of course permitted defendant to distribute the information at a much lower price than plaintiff, who had to recover substantial research costs in order to make a profit. Wainwright, 558 F.2d at 94. The Second Circuit in Wainwright found that abstracting the reports constituted a prima facie case of copyright infringement. Id. Its condemnation of the defendant's "chiseling for personal profit," id. at 97, however, could be interpreted to mean that taking the key earnings predictions in the reports was the actionable wrong. Nonetheless, the opinion provides in a footnote a number of examples of verbatim and near-verbatim copying, id. at 96, and more are contained in the lower court opinion. H.C. Wainwright & Co. v. Wall St. Transcript Corp., 418 F. Supp. 620, 625 n.4 (S.D.N.Y. 1976). Consequently, the ultimate finding of infringement in Wainwright might be justified, even if the reasoning is overbroad.

\textsuperscript{171} Even telephone white pages, if created from scratch rather than from information already stored in a computer, would involve some minimal intellectual judgment concerning such questions as how the information should be collected, how to reconcile discrepancies, and how to insure completeness. Consequently, under this reasoning they would be protected. See Electronic Maps, supra note 132, at 402; Bellsouth Adver. & Publ'g. Corp. v. Donnelley Info. Publ'g. Corp., 999 F.2d 1436, 1441 (11th Cir. 1993) (en banc) ("Any useful collection of facts . . . will be structured by a number of decisions regarding the optimal manner in which to collect the pertinent data in the most efficient and accurate manner.").

\textsuperscript{172} For example, in CDN, the court observes that protecting the estimated coin prices "allows CDN's competitors to create their own price guides and thus further competition, but protects CDN's creation, thus giving it an incentive to create such a guide." CDN Inc. v. Kapes, 197 F.3d 1256, 1262
ess—the numerical valuation or estimate itself—yields no information whether creativity was, indeed, involved in deriving it. While these cases do not involve copyright’s trenching on the domain of patent, because they deal solely with the quality of information as such,173 they demonstrate how far courts are willing to stretch logic and ordinary meaning to achieve results that comport with their sense of fairness. Other cases show a similar willingness to extend copyright coverage to products that are much closer to the functional subject matter of patent law, as measured by the notion of incremental improbability. Failure to address these subject matters adequately under patent will further encourage copyright courts to rectify a perceived misappropriation.

D. Systems and Methods for Presenting Information

I argued above that the basic idea of a contour map, were it conceived today and presented in the context of a specific map, would not be protected by the copyright in the map.174 Yet some recent decisions, particularly in the Second Circuit, have protected a methodology for presenting information as an element of the underlying work, such as a graphic work or compilation, that constitutes copyright subject matter. Before looking at some of those decisions, however, it is worth a brief review of earlier cases addressing the unruly problem of blank forms, which are also methods of presenting information.

Baker v. Selden175 not only refused to protect the creative accounting system devised by Selden but also the forms, consisting of “ruled lines and blank columns,” necessary to implement the system.176 Baker’s emphasis,

(9th Cir. 1999). In Epic Metals Corp. v. Condec, Inc., 867 F. Supp. 1009 (M.D. Fla. 1994), the court said that “[p]laintiff does not seek to prevent defendants from using statistical information or tests similar to plaintiff’s, but to prevent defendants from copying the independent test results set out in plaintiff’s brochure.” Epic Metals Corp, 867 F. Supp. at 1014.

173 See discussion supra notes 69-71 and accompanying text.
174 See discussion supra text accompanying note 133.
175 101 U.S. 99 (1879).
176 Id. at 103-04. The blank-form cases must be distinguished from those involving forms or charts intended to be used in the operation of physical devices. At least two cases have property denied copyright to charts for use with recording machinery. See, e.g., Brown Instrument Co. v. Warner, 161 F.2d 910, 911 (D.C. Cir. 1947) (holding that a chart for recording temperature and pressure was an integral part of the machine); Taylor Instrument Co. v. Fawley-Brost Co., 139 F.2d 98, 100-01 (7th Cir. 1943) (holding that a chart for recording hourly temperature measurements was an integral part of the machine and copyright protection for it would unduly impinge into the domain of patent). In these cases the chart must be calibrated according to the physical characteristics of the machine with which it is designed to work, and anyone attempting to make a useable chart to work with that particular machine must calibrate in the same way. Thus, a copyright in the chart would essentially give control over use of the machine. At least one court, however, has recognized copyright in an answer form designed to be optically scored by a machine. See Harcourt, Brace & World, Inc. v. Graphic Controls Corp., 329 F. Supp. 517, 523-24, (S.D.N.Y. 1971). That court found infringement based on defendant’s use of the form as a source for competing forms, especially defendant’s adoption of plaintiff’s choice of the letters
however, on a distinction between “copying for use” (noninfringing) and “copying for explanation” (potentially infringing)\(^\text{177}\) has created a split among the courts on the issue of the copyright-protectability of blank forms, notwithstanding a Copyright Office Regulation denying protection for forms that are designed for recording, without themselves conveying, information.\(^\text{178}\) Some deny copyright altogether,\(^\text{179}\) some allow copyright in the form but recognize only “thin” protection, so that only verbatim or near-verbatim copying will infringe,\(^\text{180}\) and some rely on the format, arrangement, and selection of subject matter to be filled in as conveying information about what the author deems important (and thus confer a per-

\(^\text{177}\) The Court set up the “explanation/use” dichotomy as follows: The description of the art in a book, though entitled to the benefit of copyright, lays no foundation for an exclusive claim to the art itself. The object of the one is explanation; the object of the other is use. The former may be secured by copyright. The latter can only be secured, if it can be secured at all, by letters-patent.

\(^\text{178}\) *Baker*, 101 U.S. at 105. It should perhaps be noted that the *Baker* Court did not address the scope of protection in the forms, were they to be used in another book that attempted to explain Selden’s system. Indeed, *Baker* seems to have written a competing book explaining the system using similar, but not identical, forms, yet the Court concluded that no copyright was infringed when Selden’s work was considered merely as a book explanatory of the system. *Id.* at 100. Therefore, when the Court later stated that publication of the forms with the book necessarily gave them to the public, “not . . . for the purpose of publication in other works explanatory of the art, but for the purpose of practical application,” *id.* at 103, it may have meant no more than that exact copying of Selden’s forms was not permitted when there were other ways of arranging the forms that would still implement the system. The Court so interpreted *Baker* in *Mazer v. Stein*, 347 U.S. 201, 217 (1954). Just how “thin” the copyright would be in such a form was not before the Court in *Baker*.

\(^\text{179}\) 37 C.F.R. § 202.1(c) (2002) excludes the following works from copyright protection: “Blank forms, such as time cards, graph paper, account books, diaries, bank checks, score cards, address books, report forms, order forms and the like, which are designed for recording information and do not in themselves convey information . . . ."

\(^\text{180}\) See, e.g., Bibbero Sys., Inc. v. Colwell Sys., Inc., 893 F.2d 1104, 1105, 1108 (9th Cir. 1990) (denying copyright protection to blank-form “superbills” designed for use by doctors of given specialties to supply patient information and diagnoses for insurance filings); Harper House, Inc. v. Thomas Nelson, Inc., 889 F.2d 197, 204 (9th Cir. 1989) (denying copyright protection to blank forms not integrated with original text); Advanz Behavioral Mgmt. Res., Inc. v. Miraflor, 21 F. Supp. 2d 1179, 1191 (C.D. Cal. 1998) (reluctantly following *Bibbero* to deny copyright to a blank form regardless of whether it contains “original expression”); Sheplers Catalog Sales, Inc. v. Old West Dry Goods Corp., 830 F. Supp. 566, 569 (D. Kan. 1993) (holding that simple instructions in a blank catalog order form lacked the creativity necessary for copyright as integrated form and text); Aldrich v. Remington Rand, Inc., 52 F. Supp. 732, 734 (N.D. Tex. 1942) (holding that forms included in brochure describing system to facilitate collection of taxes and necessary to use the system are not protected).

\(^\text{180}\) See, e.g., Continental Cas. Co. v. Beardsley, 253 F.2d 702, 706 (2d Cir. 1958) (stating that specific language in legal and insurance forms may be so essential to accomplishing the desired result that its use is incidental to using the underlying idea and so is noninfringing).
haps broader copyright).\textsuperscript{181}

A blank form deals with information in two ways. It supplies information to the user, at a minimum telling the user where to fill in the relevant data and perhaps more expansively by giving instructions on using the form. Primarily, however, a blank form is a tool by which the user supplies information to others. The first aspect is within the general coverage of traditional copyright and, subject to traditional copyright limitations such as nonoriginality and merger, should be considered copyright subject matter as a graphic or literary work.\textsuperscript{182} Its use as a tool, however, fits poorly within traditional copyright. Forms are, or at least should be, designed for ease and simplicity of use, taking into consideration whatever formats people have already become accustomed to, and for accuracy and completeness in the information to be transferred.\textsuperscript{183} Precisely what infor-

\textsuperscript{181} See, e.g., Kregos v. Assoc. Press, 937 F.2d 700, 709 (2d Cir. 1991) (holding that a selection of categories sufficiently creative to result in a copyright-protectable compilation precludes rejecting copyright as a blank form); Harcourt, 329 F. Supp. at 523 (holding that blank forms designed to be optically scanned convey information by informing the reader that they are for recording responses to an examination in a certain way); Norton Printing Co. v. Augustana Hosp., 155 U.S.P.Q. 133, 134-35 (N.D. Ill. 1967) (approving criticism of the blank-form rule and suggesting that originality and intellectual effort in the design of forms should lead to protection just as for other writings, such as posters).

\textsuperscript{182} Some courts are now treating these forms as "compilations," rather than graphic or (partially) literary works, because they involve a selection and arrangement by the form designer of what information to seek and where to place the blank space on the form for the user to insert it. See, e.g., Softel, Inc. v. Dragon Med. & Sci. Communications, Inc., 118 F.3d 955, 963-64 (2d Cir. 1997) (creative combination of functions performed by a computer program may be protected as a compilation); Kregos, 937 F.2d at 706, 709 (creative choice of categories for a baseball pitching form may be protected as a compilation); Lone Wolf McQuade Assoc. v. CBS Inc., 961 F. Supp. 587, 594 (S.D.N.Y. 1997) (character can be considered a nonfictional compilation of carefully selected traits that constitutes a creative act protected by copyright). This erroneous approach is another result of judicial eagerness to circumvent \textit{Feist}, by latchwise on to that decision's emphasis on creativity in selection and arrangement as a basis for copyright protection. The term "compilation," however, cannot be read so broadly, because it would swallow up the entire corpus of copyright subject matter, and more. A book, for example, is a selection and arrangement of words and letters, a painting is a selection and arrangement of shapes and colors, and a musical composition is a selection and arrangement of musical notes. Section 102(a) already has categories for these works—namely, literary works, pictorial or graphic works, and musical works. 17 U.S.C. § 102(a) (2000). Traditional compilations, like novels, paintings, and music, have what might be termed a "systematic organization," but the various elements of a compilation, in contrast to these other works, are not used together as parts of an integrated whole. The content elements of compilations are related, but only in the sense that they are usually of the same general type (e.g., telephone numbers, logarithms, judicial case reports). Users of compilations simply seek the individual items they need and extract those items with reference to any of the other content. A blank form, like a novel, requires the context of all of the information it contains in order to perform its intended purpose. It simply confuses the analysis to call these works "compilations" and often causes courts to lose sight of appropriate limitations on copyright protection for particular subject matter, such as functional computer programs. See Dennis S. Karjala, \textit{Copyright Protection of Computer Program Structure}, 64 BROOK. L. REV. 519, 538-39 (1998). The \textit{Bibbero} court thus quite correctly refused to treat the form in question as a compilation once it had denied copyright protection as a literary or graphic work under the blank-form doctrine. \textit{Bibbero}, 893 F.2d at 1108 n.3.

\textsuperscript{183} See Weinreb, supra note 38, at 1178 (arguing that the goal of an accounting system is to convey information simply and clearly).
information should be included in a form designed to allow doctors to provide diagnosis and treatment information for insurance purposes is something that can almost always be incrementally improved in these respects.\textsuperscript{184} Sooner or later, however, someone will hit upon a form that “works” quite well for both doctors and insurance companies. Maybe such a form will be the result of some lucky guesses or maybe it will be based on psychological research, but it should make no difference for purposes of copyright protection. Copyright subsists too long to allow a monopoly in a useful tool and any incremental (substantially similar) improvements upon it. This use of the form as an information-supplying tool must also limit the copyright in the literary or graphic information supplied to the user of the form, which is what merger attempts to achieve in these cases. In legal forms, for example, the substantive terms of the transaction are essential to its purpose, and even exact language may be necessary to assure that the legal effect of the agreement is what the parties intend.\textsuperscript{185} Therefore, giving very thin protection to a blank form to prevent slavish copying may not be problematic, as long as others can design forms seeking the same information. To go beyond this thin copyright, however, risks inhibiting incremental development of an information-delivery tool.

In \textit{Kregos v. Associated Press},\textsuperscript{186} the Second Circuit recognized copyright in a blank form solely on the basis of supposed creativity in the selection of items of information to be conveyed to the reader of the completed form.\textsuperscript{187} The case involved a “pitching form” to be printed in the daily sports pages giving certain statistical information concerning the past performances of the pitchers of the given day’s baseball games.\textsuperscript{188} While pitching forms of various types had been in use long before plaintiff designed his, plaintiff’s form contained one item that no one had previously used\textsuperscript{189} and no form brought into evidence used more than three of the nine categories used by plaintiff.\textsuperscript{190} The majority treated the case as if the work in question was a compilation,\textsuperscript{191} even while recognizing that the issue was the protectability of the categories of facts assembled in the form, not any

\textsuperscript{184} Such forms were the subject of controversy in \textit{Bibero}. \textit{Bibero}, 893 F.2d at 1105, 1108; see also supra note 179.
\textsuperscript{185} Continental Cas. Co. v. Beardsley, 253 F.2d 702, 706 (2d Cir. 1958).
\textsuperscript{186} 937 F.2d 700 (2d Cir. 1991).
\textsuperscript{187} \textit{Id.} at 704-705, 709.
\textsuperscript{188} \textit{Id.} at 702.
\textsuperscript{189} This was the “men on base average” for the last three starts by the given pitcher. \textit{Id.} at 702-03.
\textsuperscript{190} \textit{Id.} at 705.
\textsuperscript{191} \textit{Id.} at 706 (“Every compiler of facts has the idea that his particular selection of facts is useful.”); see also \textit{id.} at 709 (quoting Feist Publ’ns v. Rural Tel., 499 U.S. 340, 359 (1991)) (“Even if a work qualifies as a copyrightable compilation, it receives only limited protection . . . .”).
particular collection of assembled facts or data.\textsuperscript{192} Sending the case back to the district court to look for creativity in the selection of categories of information to display, the court said that a finding of sufficient creativity to support a copyright would preclude application of the blank-form doctrine.\textsuperscript{193} Thus, creativity in the selection of categories becomes the key to copyright protectability, evolving from the necessary condition established by \textit{Feist} to a sufficient condition independent of the limitations imposed by \textit{Baker v. Selden} and § 102(b).

\textit{Key Publications, Inc. v. Chinatown Today Publishing Enterprises, Inc.}\textsuperscript{194} is another widely cited Second Circuit decision that predicates copyright protectability on the creative selection of categories of information to supply to users. The court found that the defendant’s directory of yellow pages aimed at the New York Chinese community did not infringe that of plaintiff, because the defendant used only 28 categories to the plaintiff’s 260 and at most 17\% of plaintiff’s individual listings were reproduced in defendant’s compilation.\textsuperscript{195} However, the court framed the key issue in compilation cases as whether the “organizing principle guiding the selection of businesses . . . is in fact substantially similar.”\textsuperscript{196} Just as in \textit{Kregos}, we find the court looking solely to creativity in choosing categories for delivering information to determine copyright protectability.\textsuperscript{197} It is worth pointing out that the Second Circuit’s willingness to protect such an “organizing principle” should have elicited some justification with reference to § 102(b), which states that copyright protection does not extend to any “principle.”\textsuperscript{198} The court appears to have fallen into the error of treating creativ-

\begin{itemize}
\item \textsuperscript{192} \textit{Id.} at 702, 708-09.
\item \textsuperscript{193} \textit{Id.} at 709.
\item \textsuperscript{194} 945 F.2d 509 (2d Cir. 1991).
\item \textsuperscript{195} \textit{Id.} at 515.
\item \textsuperscript{196} \textit{Id.} at 516. This is the “arrangement” branch of the “selection or arrangement” rationale for finding copyright origination in compilations, because the choice of categories determines the arrangement of the information provided under each category. The court earlier quoted a Copyright Office guideline stating that arrangement refers to nonmechanical “ordering or grouping of data into lists or categories.” \textit{Id.} at 513 (quoting Copyright Office, \textit{Guidelines for Registration of Fact-Based Compilations} 1 (Rev. Oct. 11, 1989)).
\item \textsuperscript{197} In addition to the selection of categories, the court also relied on the plaintiff’s subjective choices of which businesses to include under each category. Businesses deemed unlikely to remain open for long, for example, were excluded. \textit{Id.} Subjective selection of the actual information to be included, of course, is the traditional stuff of copyright-protectable compilations, subject to the merger and creativity requirements. See discussion supra notes 69-71 and accompanying text. Had the court stopped at that point, the opinion would be unexceptionable.
\item \textsuperscript{198} 17 U.S.C. § 102(b) (2000). This aspect of \textit{Key Publications} was followed in \textit{Nester’s Map & Guide Corp. v. Hagstrom Map Co.}, 796 F. Supp. 729 (E.D.N.Y. 1992), where the court stated that it is not the amount of copying but rather copying the “principles guiding selection” that is critical to infringement. \textit{Nester’s Map & Guide}, 796 F.Supp. at 734 (citing \textit{Key Publ’ns}, 945 F.2d at 516). Whether the “principle” guiding selection in that case was a “principle” excluded from copyright protection under § 102(b) may be a legitimate issue, but use of the word “principle” should at least trigger
\end{itemize}
ity as a sufficient condition of copyright protection, instead of merely a necessary condition as specified by Feist.

Both *Kregos* and *Key Publications*, then, treat creativity in the selection of categories of information to be delivered to the consumer of the information as a basis for protecting that selection under copyright. The *Kregos* court allowed copyright in the selection of categories partially on the ground that the plaintiff had not supplied any formula or weights for the various factors in determining the results of the games being played. However, this is like recognizing a copyright in an early version of the arrangements of the scraps of one of the Dead Sea Scrolls. Determining exactly what the original scroll said will never be known with certainty, any more than we will know the factors that are most important in predicting the results of baseball games. The first to supply such information for baseball games might use no more than guesswork to determine what people would like to know; or he might do a large-scale market survey. In either case, it is highly likely that modifications will improve the types of information made available, if for no other reason than that later suppliers will have the benefit of feedback from users. Over time, we should expect convergence on a more or less standard set of information categories, with perhaps small variations for different audiences. We should not say, as the Second Circuit did, that these small variations are simply a matter of

some analysis under that provision. See 17 U.S.C. § 102(b) (2000) (“In no case does copyright protection . . . extend to any . . . principle . . . .”); see also discussion infra note 217.


200 See discussion supra notes 152-54 and accompanying text.

201 For example, earthquake prediction involves trying to find and correlate various factors that tend to precede onset. Scientists often engage in lengthy debates over whether given factors are truly predictive or just happened to come along with one or two tremors in connection with which they were measured. See Richard A. Kerr, Quake Prediction Tool Gains Ground, 270 SCIENCE 911, 911-12 (1995). The approach of the *Kregos* court would essentially give to the initial publisher all rights to improve upon a published set of factors (e.g., electrical signals) said to be useful in earthquake prediction but for which no combinatorial methodology is supplied. This cannot be correct. If ever there was a need to recognize and allow for incremental improvement, it is in earthquake prediction. Judge Leval in *CCC Information Services*, following *Kregos*, attempts to distinguish between “ideas that undertake to advance the understanding of phenomena or the solution of problems” and ideas “that do not undertake to explain phenomena or furnish solutions, but are infused with the author’s taste or opinion.” *CCC Info. Servs., Inc. v. Maclean Hunter Mkt. Reports, 44 F.3d 61, 71 (2d Cir. 1994). One would suspect that Judge Leval would place ideas concerning earthquake prediction in the first (copyright-protected) category, but I, at least, do not understand how predicting the results of baseball games can be distinguished, except by an ad hoc judgment that baseball is not as important as earthquakes. The untenability of this distinction between protected “soft” ideas and unprotected (presumably “hard”) ideas was probably apparent to Judge Leval, because he bolsters his infringement conclusion by applying the distinction in cases “of wholesale takings of compilations” and emphasizes that the taking in the actual case was of “virtually the entire compendium.” Id. at 71-72.

202 It is not possible just to keep adding to the information supplied. For one thing, where the goal is to deliver the information by means of newspaper printing, space limitations will restrict both the amount of information that can be given and its format. Moreover, there are limits to the amount of information the average person can digest in one sitting.
taste or personal opinion any more than we would say the same for a
given variation on an accepted arrangement of the scraps of a Dead Sea
Scroll. The Second Circuit in Kregos, by noting that the plaintiff had not
supplied any method or formula for combining his factors into a predictive
system, seems to have decided that the categories in question were not very
close to whatever might eventually be the generally accepted "standard"
categories. But that is not the point. Courts are not well equipped to
decide which systems work well and which do not. Recognizing copyright
protection in a particular selection of categories runs the risk of preventing
improvement by incremental trial and error variations. Moreover, it has
the perverse result that whoever comes up with something really valuable
by discovering categories and a method for weighing them that are demonstrably predictive has no protection, while lesser efforts by those who try and fail are protected.

203 Kregos, 937 F.2d at 707.
204 Id. Even Judge Sweet, in dissent, conceded that if Kregos had been one of the first to consider
using pitching statistics to handicap baseball games, his choice of categories would be protected. Id. at
711 (Sweet, J., dissenting). Judge Sweet would have denied Kregos protection because, given the
existence of pitching forms generally, Kregos added only his particular selection of categories, which
selection was inseparable from his idea of selecting these categories and not others. Id. Judge Sweet's
approach is therefore at least as dangerous as that of the Kregos majority. It would recognize a very
long-term monopoly in the first person to think of a clever new combination of factors that have predictive
value. Patent, and not copyright, is the regime designed to draw the appropriate social policy
balances for such functional systems.
205 After remand, the Second Circuit tried to minimize the damage by affirming a finding of no
infringement on the ground that the defendant's form contained four categories that were not in plaintif-
"s form, although the remaining six were identical. Thus, the two forms were not substantially
similar. Kregos v. Assoc. Press, 3 F.3d 656, 664 (2d Cir. 1993). The logical result of all this litigation
is that if you develop a form that works, the merger doctrine precludes any protection. On the other
hand, if you develop a form that does not work, anyone who makes more than a trivial variation on it
will not infringe because there is no substantial similarity. This might not seem so bad in principle,
because it forces people to try to think of new and better types of information to supply. The problem is
in determining just when an optimal or near-optimal selection of categories has been achieved. None
of the courts involved in this litigation attempted to find out which of plaintiff's or defendant's forms
"worked" better. Therefore, Kregos gives little protection in practice (because anyone can avoid infringement
by making small variations) except to those forms that are very close to optimal, at which point one person holds long-term monopoly in the optimal selection of categories (because the requirement to make variations forces departure from optimality). Indeed, Professor Durham has pointed
out that recognizing a copyright in Kregos's choice of categories on the ground that he did not explain
how to combine them into a (copyright-unprotectable) formula in principle confers on Kregos a
broader copyright than would be held by the author of a truly useful formula (were such a formula to
be protected by copyright): Any formula making use of Kregos's factors would be infringing, because
of the identity of the factors chosen for the formula. Durham, supra note 155, at 835.
206 The error can sometimes be avoided when the first compiler's choice of categories is highly
complete (so that she makes no creative "selection") and the second compiler presents the material in a
different format. Thus, the Eighth Circuit upheld a grant of summary judgment in favor of a defendant
who placed local school information on a web site, against a copyright claim by the publisher of a
magazine offering similar information. Schoolhouse, Inc. v. Anderson, 275 F.3d 726, 730-31 (8th Cir.
2002). The court concluded plaintiff's comprehensive approach to reporting the data would necessarily
require much overlap by any competitor, so even defendant's adoption of seventy-four percent of the
Yellow page categories, too, are the kind of thing that evolve incrementally, as feedback from users informs the creators about what is truly useful and what is not. Moreover, this is an area in which standardization is highly desirable. Recognizing copyright in a creative choice of categories for a particular directory, like a copyright in the creative method of presentation used in the first contour map, should in principle apply to any directory that adopts a substantially similar set, even for a different city. The policy goal of the “sweat” copyright, prior to Feist, was to protect the investment of the maker of a directory in gathering all of the factual information together, thereby giving an incentive to do it. Yet, nobody who wishes, for example, to create a book of Chinese yellow pages for Chicago can take advantage of any of the data-gathering effort of the Key Publications plaintiff for New York. Moreover, anyone who is familiar with the New York work and who travels to Chicago will not appreciate having to look under “tofu” instead of “bean curd” just because the law requires the Chicago (and all other) category sets to be different. Consequently, Feist’s denial of copyright protection to the aspect of compilations that, as a policy matter, most calls for protection (the investment in gathering the information) led the Second Circuit to a rationale for protection that fails to protect that aspect while still protecting a methodology for presenting factual information that should be allowed to evolve through incremental change and for which standardization is an important consideration.

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207 See Jane C. Ginsburg, No “Sweat”? Copyright and Other Protection of Works of Information After Feist v. Rural Telephone, 92 Colum. L. Rev. 338, 345 (1992) (stating that some uniformity of listings in directories may be necessary to user friendliness).

208 Id. at 346-47.

209 One of the examples given by the Second Circuit in showing plaintiff’s creativity in category selection was that of “Bean Curd & Bean Sprout Shops,” which was not a common entry in more usual yellow page directories. Key Publ’ns, Inc. v. Chinatown Today Publ’g Enters., Inc., 945 F.2d 509, 514 (2d Cir. 1991).

210 See Jane C. Ginsburg, Creation and Commercial Value: Copyright Protection of Works of Information, 90 Colum. L. Rev. 1865, 1901 (1990) (arguing that keying copyright protection to personality elements like “selection” or “arrangement” risks not protecting the commercially valuable elements of a compilation).

211 The Second Circuit took a similar approach in CCC Information Services, in addition to recognizing copyright in numerical value estimates. See discussion supra notes 156-58 and accompanying
If the selection of categories for presenting information is denied status as copyright subject matter, on the ground that their incremental improvability renders copyright inappropriate, should they be treated as patent subject matter? If the patent requirements of usefulness and nonobviousness are taken seriously, I can see little reason for not treating such selection as patent subject matter. Again let us work backwards from a polar example: Suppose someone invents a system for predicting the results of baseball games that really works; that is, in some statistically significant sense, the claimed system gets more accurate results than are available from chance. Such a system might not be particularly useful to gamblers, because they would soon shift their odds to eliminate whatever gains are achievable by using the system, but it would be demonstrably useful in the sense that it does what it claims: It gives a statistically significant better chance of choosing the result that turns out to be correct.\textsuperscript{212} Surely a process for diagnosing a disease that was less than certain but better than any previously known diagnostic procedures would be "useful" in the sense of patent law. Even under this minimal test of patent utility, Kregos's system probably would not pass muster, because he did not claim, let alone attempt to show, that his factors could be grouped in ways that led to higher predictability.\textsuperscript{213} But that should not affect the conclusion about whether his choice of categories is patent subject matter.

Developing a set of Chinese yellow pages presents a different problem as patent subject matter. In this case the system almost surely has patent

\textsuperscript{212} See Chiappetta, supra note 14, at 105-06 & nn.69-70 (discussing various views of the "utility" requirement, of which the invention's performing as claimed is the most minimal); Chiappetta, supra note 18, at 313 & nn.133-35 (interpreting the "useful, tangible and concrete results" and "practical utility" requirements established by State Street Bank). On the need for objective verification of utility, see discussion supra notes 106-14 and accompanying text.

\textsuperscript{213} Kregos v. Assoc. Press, 937 F.2d 700, 706 (2d Cir. 1991).
"utility" in its verifiable ability to direct users to businesses associated with the Chinese community in the categories chosen. The real limit on patentability must come from the nonobviousness requirement of patent law. Quite clearly, some, if not most, of the categories chosen would have to be deemed "obvious" under anybody's sense of the term. Many were common to ordinary yellow pages, and, once one has decided to focus on the Chinese community, adding categories for Chinese grocery stores or specialty items like bean curd require little if any creative thought. If the plaintiff in Key Publications was the first to offer a yellow page directory aimed at the Chinese community, finding and filling that market niche might well be nonobvious, but that determination is not qualitatively different from any other method patent that claims a new use for an old product.\footnote{214} There is no question that the Patent Office and the Federal Circuit should tighten their views on nonobviousness and undertake a broader investigation of prior art. Still, it remains possible that the directory in Key Publications would qualify as patentable. Even if that is the case, however, the scope of the patent will be determined by its claims, and it is possible that others will be able to invent around the patent and thereby provide healthy competition. And if a broadly claimed invention is valid, so that such "inventing around" is not possible, the monopoly lasts only for patent's comparably shorter term of twenty years from filing. If we bear in mind that the reasoning of Key Publications applies not only to competing New York Chinese yellow page directories but to all such directories that adopt a substantially similar selection of categories, a copyright in the selection is at least strong as the patent and goes on for much longer.\footnote{215}

In Warren Publishing, Inc. v. Microdos Data Corp.,\footnote{216} the en banc Eleventh Circuit refused, over a strong dissent, to recognize copyright in a purportedly creative selection of "principal communities" to serve as the

\footnote{214}Nor is it different from what courts will now be doing more generally for business method patent claims. Of course, not everyone agrees that business method patents should be allowed. See discussion supra notes 19-20 and accompanying text. Many of the arguments that business methods are not the "right stuff" for patent protection (because they are nontechnological or because the incentive of patent protection is thought unnecessary as an incentive for their creation) will apply to creative methodologies of organizing information for more efficient use. Key Publications is strong evidence, however, of the willingness of courts to protect such methodologies under copyright. Whatever the deficiencies of patent in application to these works, copyright is worse. Treating them as patent subject matter is more likely to lead to their exclusion from copyright.

\footnote{215}Copyright is not infringed, of course, by independent creation of the same work. However, when a work, such as a yellow page directory, has been published, access is clear, and substantial similarity will almost surely lead to a conclusion of copying rather than independent creation. See Bright Tunes Music Corp. v. Harrisongs Music, Ltd., 420 F. Supp. 177, 180-81 (S.D.N.Y. 1976) (holding that unconscious copying of widely played song is actionable). Moreover, we do not want creators of yellow page directories to reinvent every wheel. Standardization in such works has real value, and consulting existing works to adopt their useful features and improve on others is the way to advance their value as informational tools.

\footnote{216}115 F.3d 1509 (11th Cir. 1997) (en banc).
basis for listing cable television systems within a given state. The court first concluded that the plaintiff’s self-described “principal community system” for presenting the data was, indeed, a “system” ineligible for copyright protection under the plain language of § 102(b). While the reasoning was largely conclusory, the result is consistent with Baker v. Selden and the policy basis for denying copyright subject matter status to tools for the presentation of information. Even if we concede that the concept of

217 Id. at 1517. Under this system of presentation, duplication was avoided by choosing only a “principal community” served by any given cable system and supplying the relevant facts relating to that cable system under the name of the principal community. Other communities served by the same cable system were listed in plaintiff’s directory, but a cross-reference directed the reader to the principal community. Id. at 1512. The dissent argued that plaintiff’s (and the lower court’s) consistent use of the term “system” in describing plaintiff’s creative authorship was generic, not a word of art under § 102(b). Id. at 1529-30 (Godbold, J., dissenting). However, the dissent’s only argument for copyright protectability was that one could imagine an idea of collecting and reporting information on cable television systems, so that any creatively original expression of that idea, such as plaintiff’s, should be protected. Id. at 1530. The problem with this argument is that one can always go to a level of abstraction higher than the particular implementation at hand, leading to a conclusion that any system is protected by copyright. In Baker v. Selden, for example, the “idea” could be viewed as providing a useful method of presenting the financial results of business operations, so that Selden’s particular implementation of that idea would be protected. However, the Supreme Court concluded that Selden’s particular system was not copyright protected. See generally Weinreb, supra note 38, at 1171-80 (discussing Baker). Consequently, the issue is what constitutes a “system” under § 102(b). Interestingly, the dissent in Warren Publishing makes numerous references to plaintiff’s “new and original concept” or “new concept” in providing information about cable systems, Warren Publ’t, 115 F.3d at 1522, 1524 (Godbold, J., dissenting), but it does not even seem to notice that § 102(b) bars protection not only for “systems” but also for “concepts.” 17 U.S.C. § 102(b) (2000). One would think that when the most natural ways of describing the work in question require reliance on words from the list of unprotected elements in § 102(b), an explanation of why § 102(b) does not apply would be in order.

218 The majority in Warren Publishing conceded to the dissent that mere use of the word “system” is not conclusive. Warren Publ’t, 115 F.3d at 1517 n.22. However, it only stated that “system” characterization on the facts of the case was correct under §102(b) without supplying any reasons, let alone a standard for determining which “systems” are covered by §102(b) and which “systems” are not. Id.

219 As an alternative holding, the majority in Warren Publishing stated that even if § 102(b) did not preclude copyright protection for the organizational system at issue, plaintiff’s selection of principal communities would not be eligible for protection because every community listed in plaintiff’s guide was also listed in reports of the Federal Communications Commission. Id. at 1518. It even purported to distinguish Key Publications on the ground that the compiler there exercised creative judgment in selecting which businesses to include, whereas Warren had included all of the communities in the state. Id. The dissent correctly points out that plaintiff’s claim was to the selective arrangement of these communities, which involved choosing a “principal community” for each group of communities served by a given cable operator and cross-referencing all nonprincipal communities to the chosen principal community. Id. at 1525 (Godbold, J., dissenting). The majority was on more solid ground with its alternative ground of merger, where it argued that under the system of cross-referencing to principal communities, only a few ways of organizing the data existed. Id. at 1518 n.27. The dissent’s only response to this argument was to move to a higher level of abstraction, as it did in response to the majority’s denial of copyright under § 102(b)—namely, that there are other ways of organizing the information in question, even if Warren’s way was the most useful for many users. Id. at 1530 (Godbold, J., dissenting). But patent, and not copyright, is the statute designed to provide intellectual property protection for efficient and useful systems. The dissent characterized Warren’s system as a “total
saving space and avoiding duplication by using "principal communities" together with cross-references was creative and original to plaintiff, protecting that concept under copyright is bad policy. Just as for yellow page directories, relying on creativity in the concept as a basis for copyright protection logically leads to protection of the concept itself. This means not only that competitors cannot use what may well be the most efficient currently known method of supplying information about cable television systems, but when carried to its logical extreme it also means that anyone using the notion of "principal community" together with cross-references even for different states or for different purposes (such as school board information) would risk being held liable as an infringer.\footnote{220}

One can understand the reaction of both the lower court and the first appellate panel in Warren Publishing, in view of the essentially uncontroverted evidence that defendant directly copied much of the factual information included in its database from plaintiff's work.\footnote{221} That, in a nutshell, is the problem that \textit{Feist} has created. Courts cannot protect the intellectually uncreative fruits of expensive investment directly, so they are tempted to stretch copyright to cover aspects that are better left to their fate under patent law. In this case, even under the expansive readings the Federal Circuit has given to the concept of "nonobviousness,"\footnote{222} it is likely that a system consisting of choosing "principal communities" served by a cable company and cross-referencing other communities served by the same cable company is obvious, if not directly anticipated.\footnote{223} Being ineligible for a

\footnote{220}departure from prior methods utilized in the industry." \textit{Id.} If it was, a patent should have been available. \textit{But see} discussion infra note 223 and accompanying text.

\footnote{221}Independent creation of the same concept would, of course, not infringe. However, proving independent creation is not easy when the first work has been made widely available. \textit{See discussion supra} note 215.

\footnote{222}Nine or ten fictitious entries, created as decoys in plaintiff's work, were found in defendant's work, and defendant was unable to explain how they got there. \textit{Warren Publ'g, Inc. v. Microdos Data Corp,} 52 F.3d 950, 955 (11th Cir. 1995).

\footnote{223} \textit{See discussion supra} note 39 and sources cited therein. It is true that the PTO has the burden of citing concrete evidence in support of an obviousness determination and cannot rely on what it terms "common sense." \textit{In re Zurko,} 258 F.3d 1379, 1386 (Fed. Cir. 2001) (overturning affirmation by the Board of Patent Appeals of the examiner's denial of a patent on obviousness grounds). However, obviousness is ultimately a question of law, and PTO determinations of that ultimate issue are reviewed without deference. \textit{In re Woodruff,} 919 F.2d 1575, 1577 (Fed. Cir. 1990). The Federal Circuit is therefore positioned, if it chooses, to stiffen up its nonobviousness standards. \textit{See generally} Margo A. Bagley, \textit{supra} note 20 (arguing for an expanded notion of analogous prior art); Kasdan, \textit{supra} note 20 (arguing for more and better qualified examiners).

\footnote{224}Travel guides often include a major city's suburbs along with the descriptions of what the major city itself has to offer, with cross-references at the point where the suburb would otherwise appear. Therefore, even if this system had never before been used to organize information concerning cable television systems (in which case it would be anticipated and unpatentable for that reason), it would be obvious if the travel guides or other works using the same system of organization are deemed to be "analogous prior art." \textit{See Bagley, supra} note 20, at 266-71 (discussing the doctrine of "analogous prior art").
patent, the system's creator should not be able to make an end run around the patent system, for a much longer term, by using copyright.

_Bellsouth Advertising & Publishing, Corp. v. Donnelley Information Publishing, Inc._224 is another decision that the en banc Eleventh Circuit, again over a strong dissent, basically got right. The district court and the dissent found creativity in establishing a geographic scope and closing date for entries in a yellow page directory, creative selection in determining which numbers to eliminate from the directory as not being associated with an established business, and subjective choices in deciding which marketing techniques to use with which potential customers. They also found creativity in the selection of categories for business listings and subjective judgment in placing businesses into these categories.225 If the choice of geographic boundary or closing date, even if determined pursuant to the exercise of complex judgment, is to be copyright-protected, no later independent compiler of similar information can use those same boundaries. It makes no sense, however, to disallow competition of this type. The first compiler may well have chosen—and certainly she seeks to choose—the boundaries that best meet the needs of users. While the first compiler is unlikely to get it exactly right, if she is at all competent she is likely to come fairly close. We should not require second compilers to choose a different geographic area of coverage just for the sake of being different. In order to keep the competitive playing field level, we would like to insure that the second compiler bears expenses similar to those of the first, the bulk of which come from gathering the raw information in the first place. Because _Feist_ prevents protecting that information as such, even from direct copying, judges will understandably be inclined to find some other way to do it.226 The easiest way is to look for "creativity" somewhere in the work, or in its production, and pin copyright on that. Thus we go from a state of underprotection to a state of overprotection. Similarly, for the reasons discussed above in connection with _Key Publications_, the majority in _Bellsouth_ was correct in refusing to recognize a copyright in the first compiler's choice of categories.227 But both the _Bellsouth_ and _Warren_
Publishing disputes show how close the issue is for many courts and how willing judges are to expand copyright when they see no other way to protect against what appears to be unfair appropriation of another’s efforts.

E. Taxonomies

Taxonomies are a more general or abstract version of the choice of categories for the collection and presentation of facts for a specific compilation. They are in effect methodologies for breaking down the information relevant to particular branches of knowledge into organized pieces. The use of taxonomies facilitates communication among users of the information, so that each party is confident that both parties are talking about the same thing. As systems for organizing and classifying information develop and become generally accepted, they can heavily influence how people think about the subject matter of the taxonomy. A world made of fire, earth, air and water, for example, is quite different from just about anybody’s point of view from one built of some 90 or 100 basic elements—and even that world is not quite the same as one built from quarks or cosmic strings. As with telephone yellow pages, most taxonomical im-
improvements are incremental, although occasionally a true revolution occurs and an entirely new approach is adopted.

A major advantage of taxonomies is obviously the standardized language they supply for classifying and communicating information. Even a bad but relatively widely accepted taxonomy would be resistant to complete overthrow because of the difficulty of getting everybody to switch thought categories and habits simultaneously. As a result, improvements in a given taxonomical system will nearly always be incremental. Therefore, the improved system will be substantially similar to the old one and will infringe if the old system is protected by copyright. That leaves the copyright owner in sole control over improvements and even allows the copyright owner to prohibit uses of what someone else believes is an im-

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228 Fingerprint classification systems largely began with Francis Galton’s three pattern taxonomy of “arches,” “loops,” and “whorls” around 1890, to which Edward Henry later added “composites.” Simon A. Cole, Suspect Identities: A History of Fingerprinting and Criminal Identification 79, 81 (2001). Then Scotland Yard settled on a standard sixteen matching points around 1920, while other geographical regions tried variations. The taxonomy based on matching points laid claims to scientific validity of identification conclusions based on comparing latent prints left at a crime scene with inked prints taken from a suspect, but that claim has now given way to a general admission that such identification relies on holistic interpretative judgments by trained examiners. See id. at 180; see also Robert Jackall, Tales Told by Loops, Whorls, and Ridges, 293 Sci. 1771 (2001) (reviewing Cole, supra).

229 Apparently, there is now a major dispute over the appropriate taxonomy for naming and classifying living organisms. The traditional Linnaean system, proposed in 1758, runs, in Latin, from kingdom (e.g., animal) through phylum, subphylum, superclass, class, order, family, genus, and finally species. Elizabeth Pennisi, Linnaeus’s Last Stand?, 291 Science 2304, 2304 (2001). Developments in evolutionary biology present challenges to the Linnaean taxonomy, which was devised when the general world view was that of an unchanging hierarchy of organisms. Id. Now it makes more sense for many purposes to classify organisms under a phylogenetic approach, such as looking for whether two organisms share a common evolutionary ancestor and at what evolutionary distance. Id. A group of scientists has begun advocating a fundamental change in the naming system as well, called PhyloCode. Id. at 2304-05. These advocates believe that the new system would eliminate the need to change the names of organisms as new knowledge is uncovered about their evolutionary history, whereas such changes are fairly common under the Linnaean system. Id. Actually, phylogenetic trees come in many types, each being effectively a different taxonomy or means of classifying organisms for different purposes. See Barry G. Hall, Phylogenetic Trees Made Easy 48-51 (2001). That many such taxonomies are possible does not mean that each one should be the exclusive property of its creator for the long term of copyright protection. If it did, convergence on an optimal tree for a given purpose would be much more difficult.

230 Taxonomies have characteristics like those of a “virtual network,” in which the value of the taxonomy inheres not only in the efficiency and ease-of-use it supplies a given user but also in each user’s knowledge that other users will readily understand information supplied using the taxonomy’s categories and language. On network effects in law generally, see Mark A. Lemley & David McGowan, Legal Implications of Network Economic Effects, 86 Cal. L. Rev. 479 (1998).

231 Of course, standardization concerns may impel a given group of users to require formal approval of proposed incremental changes. Each change, if approved, involves retooling costs, both for human beings who have become fixed in their way of thinking and for forms, computer programs, and similar tools that are used to implement the system. Consequently, one should expect differences of opinion as to whether a particular proposed change is an improvement and, even if so, whether its adoption is justified by the cost.
proved taxonomy.\textsuperscript{232} The long term of copyright protection, coupled with incremental changes adopted every so often by the copyright owner, leaves essentially one person perpetually in charge of improving the system, at least until a major paradigm shift causes users to switch to a new taxonomy.

In \textit{Practice Management Information Corp. v. American Medical Association},\textsuperscript{233} the Ninth Circuit would have enforced (but for copyright misuse) the copyright in a "coding system" designed to enable medical service suppliers to identify medical procedures with precision.\textsuperscript{234} In this declaratory judgment action, the plaintiff wanted to make verbatim reproductions of the defendant American Medical Association's ("AMA") publication establishing the taxonomy by assigning code numbers to some 6,000 medical procedures.\textsuperscript{235} In view of the proposed verbatim copying, the result is not obviously wrong, as such copying would almost surely have taken something that was both original to the AMA and not necessary for communication of its taxonomy.\textsuperscript{236} However, the court erred in stating that copyright in the coding system would not prevent others from developing comparative or better coding systems.\textsuperscript{237} Because standardization is so important, radical change is unlikely to be accepted, especially given the AMA's de facto role as standard setter for the medical industry. And the copyright inhibits incremental change because of the substantial similarity test for infringement.

What was implicit in \textit{Practice Management} became explicit in \textit{American Dental Association v. Delta Dental Plans Associated},\textsuperscript{238} in which the Seventh Circuit expressly held that original (creative) taxonomies are

\textsuperscript{232} This is what happened in \textit{American Dental Association v. Delta Dental Plans Associated}, 126 F.3d 977 (7th Cir. 1997). See discussion infra note 245. The problem is similar to Microsoft's copyright in the Windows operating software. When only the copyright owner has the legal right to improve what has become the nearly universal access to computing technology for nontechnical users, we can expect reduced technological innovation and efficiency. Karjala, supra note 43, at 174-75.

\textsuperscript{233} 121 F.3d 516 (9th Cir. 1997).

\textsuperscript{234} \textit{Id.} at 521.

\textsuperscript{235} \textit{Id.} at 517.

\textsuperscript{236} The plaintiff did not challenge the district court's determination that the system was original. \textit{Id.} at 520 n.8. It apparently did argue that the taxonomy was not protectable under § 102(b). \textit{Id.} see also Malla Pollack, \textit{Pervenance and Power, or Over-priced Free Lunch: The Intellectual Property Clause as an Ally of the Takings Clause in the Public's Control of Government}, 30 SW. U. L. REV. 1, 11-12 (2000). However, the Ninth Circuit interpreted the § 102(b) issue as involving only potential copyright invalidity due to a federal agency's mandating use. \textit{Practice Mgmt.}, 121 F.3d at 518, 520 n.8 (stating that the two reasons offered by plaintiff for invalidating the copyright were the federal agency mandate and copyright misuse).

\textsuperscript{237} \textit{Practice Mgmt.}, 121 F.3d at 520 n.8. Again, the court's use of the term "system" to denote what copyright prevents from "wholesale copying" should have triggered, but did not, analysis under § 102(b), which says that copyright does not extend to any "system." See discussion supra note 217.

\textsuperscript{238} 126 F.3d 977 (7th Cir. 1997).
copyright-protected. The court concluded that a taxonomy of dental procedures was not a system under § 102 because it did not come with instructions for use, comparing it to a dictionary or an architectural blueprint. Neither a dictionary nor a blueprint, however, is a “useful article” in the sense used in the Copyright Act, because neither has any function other than to inform or portray an appearance to human beings. Although the court was correct in concluding that the separability test applies only to useful articles that are also pictorial, graphic, or sculptural (“PGS”) works and that a taxonomy was not in the latter category, it failed to analyze correctly the implications of Baker v. Selden for useful articles, like an accounting system, that are not PGS works. The availability of a variety of ways for classifying dental procedure information should not make a particular choice copyright protectable any more than the availability of a large number of accounting systems made Selden’s particular system protectable. Basing copyright protection on the notion that the taxonomy did not come with instructions for use is also incorrect. At a minimum, instructions are implicit, because the entire value of such a taxonomy is to associate precisely each procedure described in the work with a unique number, for insurance billing and related purposes. Whether a taxonomy is protected by copyright should not depend on whether the creator expressly states at the beginning, “Identify each procedure listed herein with the associated number assigned to that procedure.”

If taxonomies are ineligible for copyright protection on the rationale that useful taxonomies usually develop by incremental improvements, does it follow that patent protection should be available, at least for those paradigm-shifting taxonomies that can revolutionize the way we think about

239 Id. at 979. Creativity was based on the absence of merger; that is, on the existence of a large variety of potential ways for classifying dental information. This creativity even extended to the numbers chosen to represent the various procedures. Id.

240 Id. at 980-81.

241 See discussion supra note 38 and accompanying text. Moreover, both dictionaries and blueprints are explicitly included within copyright subject matter as literary and graphic works, respectively. 17 U.S.C. § 102(a) (2002). A work describing a taxonomy, like Selden’s book describing his system of accounting, may well be an original literary work that is protected by copyright. That conclusion does nothing, however, for the copyright-protectability of the taxonomy described in the book, any more than it made Selden’s accounting system protected by copyright.

242 Am. Dental Ass’n, 126 F.3d at 980-81.

243 Simpler taxonomies make these points more obvious. Thus, a four-part classification system for women’s bodies, denominated H-O-A-X and used as an organizing principle for a book of fashion suggestions, was not infringed by a book whose author adopted the same classification system for a fashion reference book, at least where the same letters were not used to describe the different body types and the classification system was not used as an organizing principle. Duffy v. Penguin Books USA, Inc., 4 F. Supp. 2d 268, 273 (S.D.N.Y. 1998). Even Duffy, however, did not rely on § 102(b) or Baker v. Selden to deny protectability to the “system” at issue and implied that use of the same labels pursuant to the same “organizing principle” might be infringement.
particular branches of knowledge? It is difficult to come up with a distinction between taxonomies and, say, revolutionary new accounting systems or cartographical methodologies that would categorically deny status as patent subject matter to taxonomies. The main difference may be that standardization concerns often result in taxonomy development through centralized bodies in any event, so that neither the patent nor the copyright incentive is necessary. Some taxonomies, such as the classification of the so-called "elementary particles" of subatomic physics, may fall naturally under the rubric of "abstract idea," along with the underlying theory that leads to or suggests such a classification. But if we are forced to choose between the two major intellectual property paradigms, patent protection for the relatively few revolutionary advances in taxonomy creation seems much better than copyright for all "original" taxonomies. Many, if

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244 Patents have been granted for much simpler systems of musical notation. See In re Beatie, 974 F.2d 1309, 1311-13 (Fed. Cir. 1992) (denying patentability on obviousness grounds to both a marker and a method of musical notation but discussing various prior art patents). Beatie refers to the Guilford patent, No. 608,771, which would substitute the notation of the standard twelve-note musical scale of seven letters and five intervening sharps or flats (C, C-sharp or D-flat, D, . . . B) with the twelve numbers from 1 to 12. Id. at 1311-12. At issue in these cases is simply a taxonomy for naming the notes of a standard musical scale. While some of the claims in Beatie and the cited references also involved a physical apparatus, in the form of a card that would lie on the piano keys showing the student/player which key was associated with the old and/or the new names, it is clear that all of the invention (if any) was in the new naming system. Moreover, the claimant in Beatie sought both apparatus and method patents, and his argument did not distinguish among them. Id. at 1311. Indeed, the Guilford patent is discussed by the court solely as a "recommendation of a new musical notation system." Id. at 1312-13. There is no discussion of any instantiation of this proposed system in a physical apparatus. It seems that the Guilford system did not catch on, but it might have. Had it proven much easier for learners and musicians to use Guilford's system, he would have had a seventeen-year "stranglehold" on preparing and even reading sheet music. Whether that would have been good as an example of the kind of innovation patent is designed to encourage or bad as an example of requiring public benefit unnecessarily is a question we may leave to another day. A copyright in the system, especially under today's long term, would have offered no greater incentive and would have burdened the public for a much longer period.

245 The Ninth Circuit in Practice Management simply asserts that copyright supplied the economic incentive for the AMA to develop the procedure manual. Practice Mgmt. Info. Corp. v. Am. Med. Ass'n., 121 F.3d 516, 518 (9th Cir. 1997). There is, however, good reason to be skeptical of this assertion. The promulgation of standards is one of the most important functions of professional associations. Indeed, American Dental Association was primarily a case about using copyright to enforce standardization rather than stopping a free rider. Am. Dental Ass'n., 126 F.3d at 981 ("The fact that Delta used most of the Code but made modifications is the reason ADA objects, for variations salted through a convention impede communication."). Standardization of the system for reporting information by busy professionals is of utmost importance in reducing the time and cost of paperwork. The issue is whether intellectual property law should supply the enforcement power to the creator of the basic standard or whether each professional group should work out on its own how variations on the standard should be agreed upon or put into use. Once we are past the incentive question, which will be the case if professional organizations indeed do have independent reasons for developing standards, there is little in intellectual property theory to suggest that intellectual property rights are necessary to the efficient creation of useful standards. See generally Friedman, supra note 72, at 1121-24, 1128-29 (suggesting intellectual property protection for standards that are expensive to devise or are inexpensive to devise but expensive to establish as standards).
not most, taxonomies will not be patentable for obviousness or anticipa-
tion.246 For those few new taxonomical inventions that meet the rigorous
patent standards, the patent seems no less inhibiting to potential improvers
than a copyright, and it goes into the public domain much faster.

F. Model Codes and Statutes

One of the more challenging problems for a theory seeking to distin-
guish patent and copyright subject matter is posed by privately drafted
codes and statutes that are written for the purpose of adoption as law or
legally binding regulation by federal, state, or local governments. On the
one hand, such model codes are simply words written on paper, with all the
attributes of a traditional literary work. On the other hand, when any such
model code is adopted into positive law, it does much more than simply
inform human beings concerning the subject matter of the code. It actually
regulates human behavior, to the extent citizens seek to comply with the
law, and provides for civil liability of, and perhaps even criminal penalties
against, those who do not comply. Once enacted, therefore, the model
code as enacted statute or regulation is a functional work. Moreover, all
of the reasons for eschewing the copyright protection of function apply in
full force. Codes and statutes are almost classically an example of the kind
of thing that develop through incremental improvement. A building code
that differed in only one or two provisions from a given model code would,
under any normal understanding of the term, be “substantially similar” to
the model code. Thus, at least in principle, recognizing copyright protec-
tion in the model code gives a very long-term monopoly to the person or
organization that manages to come up with a code that works well enough
to become widely adopted.

There is a solid basis in traditional copyright law for denying copyright
protection to privately drafted model codes. Merger of idea and expression
is compelling in the circumstances of an enacted model code. One cannot
change even a single word of a statute without potentially changing its
meaning, so it would seem that whatever idea is expressed by the statutory
language necessarily merges into the exact language chosen to express it.
There is not even any room for close paraphrasing, if the statutes are relia-

246 The systems for classifying medical and dental procedures in Practice Management and
American Dental Association were almost surely anticipated in their general scheme of assigning a
number to a procedure. Moreover, breaking down the variety of procedures into groups, like evalua-
tion, anesthesia, surgery, radiology, pathology, and medicine, Am. Dental Ass’n, 121 F.3d at 517, is
likely to follow time-honored custom in the profession. The only thing left for a potential patent would
seem to be the numbering system itself, but a thorough search of prior art, especially in other disci-
plines, may well reveal anticipation there as well.
bly to function in the same way. This becomes even more important with time, as judicial decisions add gloss to the statutory language. Moreover, the Supreme Court held in *Banks v. Manchester* that state judicial opinions could not be copyright protected partially on the ground that the law, which binds every citizen, must be freely available to all of them.

The Fifth Circuit, however, in *Veeck v. Southern Building Code Congress International, Inc.*, initially rejected both of these grounds for denying copyright protection to privately drafted model codes. Although the en banc Fifth Circuit later sided with the copier of a model code adopted into positive law, six out of fifteen judges would have followed the reasoning of the initial panel: The en banc dissent rejected the public policy argument based on *Banks v. Manchester* by asserting that stripping a work of its copyright when adopted by a legislative body would be destructive of the incentive to write model codes. Neither the en banc dissent nor the initial panel pondered the implication of the fact that model acts of all kinds have been written by individuals and groups for many decades without any assurance that the end product would be protected by copyright.

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247 128 U.S. 244 (1888).
248 Id. at 253.
249 241 F.3d 398 (5th Cir. 2001), rev'd, 293 F.3d 791 (5th Cir. 2002) (en banc).
250 Id. at 404-08.
251 *Veeck*, 293 F.3d at 807 (Higginbotham, J., dissenting); id. at 812, 817 (Wiener, J., dissenting).

The en banc dissenters cite no authority at all for this assertion. See generally id. at 806-825. The initial panel simply cites the Nimmer treatise and *Practice Management* in support of its claim that to deny copyright would destroy the incentive to create model statutes. *Veeck*, 241 F.3d at 405-07 & n.33 (citing MELVILLE B. NIMMER & DAVID NIMMER, 1 NIMMER ON COPYRIGHT § 5.06[C] (2000)). However, *Practice Management* itself did no more than simply state this unsupported assertion. See discussion supra note 245. The en banc dissent relies on this unsupported conclusion for declining to treat the enacted code as unprotected "idea." *Veeck*, 293 F.3d at 807. (Higginbotham, J., dissenting). It argues, correctly, that the idea/expression distinction in a particular case simply represents a policy conclusion and is not analytically useful. Because it already found the policy balance to tilt toward protection for the sake of encouraging the private writing of model codes, the idea/expression distinction added nothing to the code copier’s argument. Id. at 823 (Wiener, J., dissenting). The dissenters did not address the majority’s argument that the enacted code was unprotected fact independent of the idea/expression dichotomy. Id. at 802 (“The building codes ... can be expressed in only one way; they are facts.”).

252 Indeed, a First Circuit decision from 1980 evinced serious reservations about the copyright protectability of such codes. *Bldg. Officials & Code Adm. v. Code Tech., Inc.*, 628 F.2d 730, 735 (1st Cir. 1980) (“We are, therefore, far from persuaded that BOCA’s virtual authorship of the Massachusetts building code entitles it to enforce a copyright monopoly over when, where, and how the Massachusetts building code is to be reproduced and made publicly available.”). It was not until *CCC Information Services* in 1994 that the tide began to turn the other direction. *CCC Info. Servs., Inc. v. Maclean Hunter Mkt. Reports, Inc.*, 44 F.3d 61, 68 (2d Cir. 1994) (overturning a lower court decision holding that a compilation of used-car valuations had fallen into the public domain because governmental regulations mandated the use of valuations supplied in that compilation). The en banc majority in *Veeck* noted that the copyright owner in the case, SBCCI, had “survived and grown over 60 years” without judicial assurance of copyright protection for enacted building codes. *Veeck*, 293 F.3d at 805.
The merger analysis of the copyright proponents on the Fifth Circuit is even weaker. They argue, correctly, that there are many ways to write model codes.\textsuperscript{253} For the en banc dissent, that was enough to preclude merger, without addressing the question of how the copier could have used different expression to state the idea of the specific building code he reproduced. The initial panel tried to elaborate, concluding that copyright protection in a model code does not prevent (1) the adoption of codes that make the same requirements (presumably with different “expressive character”), (2) the adoption of only parts of the model codes, or (3) changing the model codes.\textsuperscript{254} If these conclusions were true, they would be important; but, in fact, conclusions (2) and (3) are simply false. Absent a license, verbatim adoption of only parts of a protected model code would infringe the “expression” in those parts in precisely the same way that adoption of the entire code would. Moreover, making changes would constitute the unlawful preparation of a derivative work.\textsuperscript{255} As to conclusion one, rewriting codes to give the same meaning in different language would normally be an acceptable basis for denying application of the merger doctrine,\textsuperscript{256} but that breaks down in the case of statutes, where exact wording is critical. If judges called upon to interpret a statute are shown earlier statutes covering the same subject matter with different language, they are quite likely to conclude that the legislature meant to achieve at least some different results. Forcing proponents of largely similar statutory approaches to use very different language to achieve their common objectives (and not just the objectives as to which they truly wish to differ) can lead to unexpected and unintended results and can also inhibit the jurisprudential processes that give substantive meaning and understanding to legislative language as it gets interpreted by courts. In short, copyright in privately drafted model codes will inhibit incremental improvements, both proposed and implemented, in those codes because of copyright’s powerful derivative work rights and “substantial similarity” test for infringement.

The en banc majority of the Fifth Circuit in \textit{Veeck} held that publishing building codes as adopted by particular communities and not as model

\footnotesize{(citing 1 GOLDSTEIN ON COPYRIGHT § 2.5.2. (2002) (arguing that trade organizations have powerful independent incentives to draft model codes)).}

\textsuperscript{253} 241 F.3d at 407.

\textsuperscript{254} \textit{Id.} at 408.

\textsuperscript{255} Of course, drafters of model codes will always grant a license to any governmental agency seeking to make use of their works. However, the question is whether such drafters should have the power to stop given governmental agencies from making changes with which they disagree and, perhaps more important, whether they can stop other private parties from rewriting such works, as derivative works, and offering them as “improvements” on the copyright-protected version.

\textsuperscript{256} The classic example would be rewriting Einstein’s papers on the theories of relativity. There are many ways to explain those theories in different language, so copyrights in Einstein’s articles do not prevent others from writing about the underlying, unprotected ideas.
codes, did not infringe the copyright.\textsuperscript{257} Such a model code enacted into law becomes a fact, the unique expression of local law.\textsuperscript{258} The opinion stresses that the author retains a copyright in the model code as such.\textsuperscript{259} This would seem to leave protection in place for model codes that have not yet been enacted anywhere, which can interfere with the creation of improved versions that start from a given model code and differ in only specific provisions (because such improved versions would constitute derivative works). This not only forces competing code drafters to start from scratch but can also unintentionally affect the judicial interpretation of whatever version is eventually adopted.\textsuperscript{260} Thus, while the majority got to the correct result, its reasoning ignores the fundamental notion of incremental improbability of a functional work that best defines the patent/copyright borderline.\textsuperscript{261}

The case against copyright protection for privately drafted model codes is therefore quite strong, on both public policy and traditional copyright grounds. The initial panel decision and the en banc dissent in \textit{Veeck}, however, as well as the cases on which they rely,\textsuperscript{262} show the power of the “restitutionary impulse”\textsuperscript{263} in the judiciary and courts’ willingness to fill apparent gaps in protection by expanding copyright coverage. Even the en banc majority in \textit{Veeck} was unable to craft an opinion that would treat model codes as what the opinion expressly recognizes them to be—if not as directly functional works, then as works that are designed and intended to be used as functional tools for regulating various forms of human behavior through enactment into law.

If copyright is bad for the protection of privately drafted model codes—as it is—would recognition of patent protection for new and nonobvious features of model codes be effective in stemming the judicial rush to copyright? Even if so, would the result be better than just letting things go along as they are?

There are, of course, important downsides to patent protection for novel and nonobvious “inventions” in legal relationships and their structures. The most immediate question is whether such protection is necessary or valuable as an incentive. That is, will affording patent protection to such inventions enlarge the range of choices that are available to governments seeking to improve their statutes and regulations? I am aware of no

\textsuperscript{257} \textit{Veeck}, 293 F.3d at 802 (en banc).
\textsuperscript{258} \textit{Id.} at 801.
\textsuperscript{259} \textit{Id.} at 802, 806 & n.22.
\textsuperscript{260} \textit{See} discussion supra note 256 and accompanying text.
\textsuperscript{261} The en banc majority did observe that “the text of the model serves no other purpose than to become law.” \textit{Veeck}, 293 F.3d at 805.
\textsuperscript{262} Practice Mgmt. Info. Corp. v. Am. Med. Ass’n, 121 F.3d 516 (9th Cir. 1997); CCC Info. Servs., Inc. v. Maclean Hunter Mkt. Reports, Inc., 44 F.3d 61 (2d Cir. 1994).
\textsuperscript{263} \textit{See} discussion supra note 130.
evidence indicating that such an incentive is necessary, but an assumption of many of the judges that have considered the issue is that some incentive is, in fact, necessary. Even the en banc majority in *Veeck* was careful to state that the code drafter retained the copyright in the code as a model code, although not as the enacted law of the adopting jurisdiction.\(^{264}\) If we accept that assumption, patent again appears vastly superior to copyright for the protection of model codes.\(^{265}\) The main reason, as always, is that the patent term is much shorter, so any novel structure will be generally free in about twenty years. Moreover, it seems unlikely that mere wordings of existing laws will qualify as nonobvious advances, so much of the precise wording of any given model code will simply not be covered by any assumed patent. Rather, the patent would cover the structural relationship created by the relevant language (or any language accomplishing the same structural relationship). Thus, things like the "invention" of a new layer of administrative review for denial of a building permit or a system of fines or rewards based on new concept of violation reporting might be patentable, but much of the code would remain free of intellectual property protection.

There is a theoretical middle ground that might be explored by the judiciary. Indeed, something like this may be what the en banc majority in *Veeck* had in mind in stressing that the code drafter retained copyright in the code as model code. We could recognize "copyright" in a given model code but limit protection only to the exact language used in connection with the drafting organization’s name. That is, if the AMA were to draft a model code on hospital regulation, only the AMA could publish that code as the AMA code on hospital regulation. Anyone else would be free, however, to use the same language as a basis for drafting different model codes or even as a suggested model code as long as she does not identify her code as that of the AMA.\(^{266}\) In a sense, this would be using copyright to achieve trademark objectives. Indeed, trademark notions may be the underlying

\(^{264}\) *Veeck*, 293 F.3d at 802.

\(^{265}\) Even if we reject as unproven the assumption that some intellectual property incentive is necessary if governments are to be optimally supplied with model codes and statutes, we must face the fact that copyright courts appear to be going in the opposite direction, with the majority in *Veeck* giving perhaps a hint of slowing that down. The central thrust of this Article is that there is always a strong tendency for copyright courts to veer in the direction of protection where they see what appears to be free riding. We can try to educate the courts to take a broader view—one that allows them to see the public benefits of free use in addition to the value of a creation incentive—but this author harbors little hope for success in such an endeavor. Why else are we still arguing about these things more than a century after *Baker v. Selden* and more than a quarter-century after the formal adoption into positive law of § 102(b)?

\(^{266}\) The en banc *Veeck* majority would not, apparently, go this far. According to *Veeck*, the model code remains protected as a model code. *Veeck*, 293 F.3d at 802, 806 & n.22. In this case, anything based on it that takes "expression" would infringe if offered as a model code (even an improved model code).
issue in these conflicts in the first place. Most people will likely be willing to pay for, and to seek out, the "official" versions of the Uniform Commercial Code, model statutes adopted by the National Commissioners on Uniform State Laws, and models drafted by well known private organizations. Unfortunately, nothing in basic copyright theory leads in any natural way to this very sensible limitation. In reality, if we are down to a choice between copyright and patent, patent is by far the better choice.

G. Teaching Methodologies and Techniques

In principle, it is difficult to distinguish teaching methodologies from medical procedures or other industrial processes that have long been deemed patent subject matter. A book describing, for example, a concrete step-by-step system for teaching addition to children would be copyright protected, but the underlying system should be protected, if at all, under patent law. The problem with teaching methodologies is that they are usually quite vague and indeed are often only implicit in the copyright-protected teaching materials, such as textbooks.\textsuperscript{267} Thus, a true (or at least apparent) advance in teaching effectiveness may occur when someone writes a textbook with the subject matter presented in a new order, or with different topics, or with differing emphasis on the topics covered. The copyright in the textbook protects the author from verbatim copying of her language, but does it extend to protect the selection and arrangement, such as the ordering, of the materials contained? If it does, the first author to discover a close approximation to the most efficient selection and ordering of materials for teaching effectiveness\textsuperscript{268} will have a long-term monopoly on that teaching methodology, which can inhibit further incremental improvements (whether by trial and error or by more explicit design).\textsuperscript{269} The vague scope of protection under copyright’s “substantial similarity” test for

\textsuperscript{267} Even if treated as patent subject matter, therefore, patents in this field would likely be rare. Beyond the nonobviousness hurdle is the difficulty of defining precisely what the invention is and objectively proving that the claimed invention actually does what is claimed. See discussion supra notes 106-114 and accompanying text; discussion supra note 212 and sources cited therein.

\textsuperscript{268} It may be countered that we do not know whether a “most efficient selection and ordering” of textbook materials actually exists. However, everyone will agree that some conceivable selections or orderings are not going to work as well for teaching purposes as others, even without going to absurd extremes like teaching Shakespeare to kindergartners. All teachers have the experience of evaluating texts as they teach with them, and they draw conclusions that some books work better than others. While there is disagreement as to which books work best, and why, often a single text comes to dominate a field. It is unlikely that such popularity is due solely to the writing style of that book’s author. More likely, that author has found a selection and arrangement of materials that allows both teachers and students to use the content more effectively.

\textsuperscript{269} Another problem with textbooks is that the market often consists not of the actual purchasers of the books but of the teachers who adopt the books for their courses. Once teachers become used to teaching materials in a given order, they will be resistant to change, and whichever text manages to gain a significant percentage of the market will be less challenged by competitors whose organization is different, even if it could be objectively shown that the latter is better.
infringement and the long term of copyright protection are thus inappropriate to the selection and arrangement of textbook materials. \(^{270}\)

Case law in this area goes in all directions. Several pre-\textit{Baker v. Selden} decisions concluded that copyright in a book extended to the plan, arrangement, and composition of materials included therein. \(^{271}\) In \textit{Emerson v. Davies}, \(^{272}\) Justice Story found an arithmetic text copyright protected based on the time, labor, skill, and expense that went into its creation, partially by analogy to patent law, which permits a patent on a new arrangement of well known pieces like screws, wheels, and levers. \(^{273}\) Infringement was based on an identical "mode of illustration by progressive lessons," with questions put in the same form and using visible (although different) unit marks, notwithstanding that the plaintiff's method appeared to be a "real and substantial improvement" upon previous works. \(^{274}\) \textit{Greene v. Bishop} \(^{275}\) extended \textit{Emerson} to cover a "system of grammar," \(^{276}\) and \textit{Drury v. Ewing} \(^{277}\) extended it to cover the invention or discovery of a dress design, represented by a chart in a published book. \(^{278}\)

In the decades following \textit{Baker v. Selden}, courts were somewhat more circumspect in allowing a book copyright to extend to methodologies presented in the book, but the arrangement of materials was often implicitly treated as protected by the copyright in the book. \(^{279}\)

\(^{270}\) It is perhaps worth emphasizing that we are here dealing with the organization of textbooks and similar teaching materials, where the methodology sought to be protected relates to the pedagogical advantages of organizing information in one way rather than another. Admittedly, the line between pedagogical methodologies and, say, the organization of events described in a novel will not always be clear. For the latter, only the idea/expression distinction serves as a limit to the copyright protectability of the book's organization, because the book's organization has only the function of appealing to readers' aesthetic sensibilities. A textbook, too, seeks to convey information to human beings, but its organization often serves as a tool for getting the information across in the most efficient manner. We can get to the same result advocated here on policy grounds by appeal to long-standing copyright tradition of giving "thinner" protection to works of science, history, and similar branches of learning than is afforded to novels. See discussion infra note 297 and accompanying text.

\(^{271}\) \textit{E.g.}, \textit{Emerson v. Davies}, 8 F. Cas. 615, 619 (D. Mass. 1845) (No. 5,763); \textit{Greene v. Bishop}, 10 F. Cas. 1128, 1134 (D. Mass. 1858) (No. 4,436); \textit{see also} \textit{Drury v. Ewing}, 7 F. Cas. 1113, 1117 (No. 4,095) (S.D. Ohio 1862) (the use of "same principle" for dress design charts that produced substantially the same dress was "wholly conclusive" on the question of infringement of the copyright in a book presenting the original design).

\(^{272}\) 8 F. Cas. 615 (D. Mass. 1845) (No. 4,436).

\(^{273}\) \textit{Id.} at 619. Thus, Justice Story wholly missed the crucial distinction between patent and copyright that was later articulated in \textit{Baker v. Selden}.

\(^{274}\) \textit{Id.} at 621.

\(^{275}\) 10 F. Cas. 1128 (D. Mass. 1858) (No. 5,763).

\(^{276}\) \textit{Id.} at 1133.

\(^{277}\) 7 F. Cas. 1113 (S.D. Ohio 1862) (No. 4,095).

\(^{278}\) \textit{Id.} at 1116.

\(^{279}\) \textit{See, e.g.}, \textit{Guthrie v. Curlett}, 36 F.2d 694, 696 (2d Cir. 1929) (holding that there was no monopoly on information concerning freight tariffs or purveying information by a broad general method, but suggesting that the particular arrangement and symbols used were protected); \textit{Edward & Deutsch
More recently, a federal district court concluded that copyright protected a book designed to teach preschool-age children the skills necessary to learn to read, and that the copyright was likely infringed by a competitor’s book that adopted the same “teaching approach” (alternating between workbook exercises and a “Magic Book” that would light up when the correct answer was selected) to essentially the same set of skills in the same sequence.\textsuperscript{280} Other cases, however, have recognized that textbooks are not works of fiction, that the market is shaped by professors who desire texts to conform to their class notes, and that radical departures from standard jargon or substantive professional consensus is not possible, thereby limiting stylistic differences and the range of choices for presenting materials.\textsuperscript{281}

One of the more thoughtful decisions along these lines is Kepner-Tregoe, Inc. v. Carabio,\textsuperscript{282} an obscure 1979 district court opinion from the Eastern District of Michigan. At issue were materials for teaching problem-solving in management training programs, a field in which the plaintiff

\textsuperscript{280} Grolier, Inc. v. Educ. Reading Aids Corp., 417 F. Supp. 665, 667 (S.D.N.Y. 1976) (granting of a preliminary injunction). An important Tenth Circuit decision also concerned a “reading program” that made direct use of a computer and left the court hopelessly confused between the computer program and the “program” for teaching reading by using a specific methodology that was implemented by the computer program. Autoskill, Inc. v. Nat’l Educ. Support Sys., Inc., 994 F.2d 1476, 1481 (10th Cir. 1993). That methodology comprised oral reading tests in which words were displayed on the screen that the student attempted to read orally, with a “trainer” to determine correctness, speed, and accuracy; an auditory visual matching test, in which three word choices appeared on the screen and an auditory stimulus of a target word or nonsense word was presented to the student, requiring the student to select which word he heard and indicate his response by hitting the 1, 2, or 3 key; a visual match, in which the student had to match one of three words to a target word; alternating use of words and nonsense words and three specific testing topics; immediate feedback about accuracy; specific criteria for progressing to the next subprogram; presentation of skills hierarchically from the simple to the complex; use of a visual scanning test to determine the student’s subtype; and recording student progress in matrices and graphs. \textit{id.} at 1497. This system looks very much like an attempted improvement over existing teaching methods and a methodology that itself could be further refined. Yet the court upheld a finding of infringement. \textit{id.} at 1499. Defendant’s changes in color and word choices were rejected as showing copyright dissimilarity because they “were not important or substantial parts of Autoskill’s program” and were not “pedagogically significant.” \textit{id.} at 1497. The court forgot that copyright protection under \textit{Baker v. Selden} is supposed to be limited to such choices and should not extend to methodologies, especially those that are pedagogically significant (i.e., effective in teaching). For a critical analysis of Autoskill, see \textit{A Coherent Theory}, supra note 13, at 85-86.

\textsuperscript{281} McGraw-Hill, Inc. v. Worth Publishers, Inc., 335 F. Supp. 415, 421 (S.D.N.Y. 1971) (holding that an economics text had to conform to the “Samuelson methodology”); \textit{see also} Morrison v. Solomons, 494 F. Supp. 218, 224-25 (S.D.N.Y. 1980) (stating that similar organization and structure are to be expected in introductory organic chemistry texts and even substantially identical chapter and sub-chapter headings do not in themselves establish copying; the issue is whether the treatment of the subject matter within each heading is substantially similar).

was a dominant player.\textsuperscript{283} Citing \textit{Baker v. Selden}, the court expressly stated that the plaintiff enjoyed no protection for its approach to or techniques for problem solving\textsuperscript{284} and that the scope of protection for works describing such techniques must be limited. Broad protection would foreclose competition, because works explaining the useful arts must necessarily bear some resemblance to one another in order to be effective and to be accepted in the market.\textsuperscript{285} The court recognized the value of allowing incremental variation in order to advance the cause of teaching.\textsuperscript{286}

This same plaintiff, however, was more successful fifteen years later when it claimed infringement of similar training materials for teaching managerial leadership and decisionmaking. In \textit{Kepner-Tregoe, Inc. v. Leadership Software, Inc.,}\textsuperscript{287} the Fifth Circuit found that defendant’s computer program infringed plaintiff’s materials, at the core of which were eight “questions” or “problem attributes” and five “definitions” or “processes.”\textsuperscript{288} The court was probably correct in upholding the finding of infringement based on nearly verbatim copying of the eight questions and five definitions that constituted the “heart and soul” of the teaching program;\textsuperscript{289} however, in considering defendants’ proposed modifications of those items, it analogized to traditional literary works, in which the scope of protection is broad, to conclude that similar content would be infringing, even though phrased differently.\textsuperscript{290} The court also relied on \textit{Feist} for the proposition that structure, sequence, and organization may be protected by

\begin{footnotesize}
\begin{itemize}
\item \footnotetext[283]{\textit{Id.} at 132.}
\item \footnotetext[284]{\textit{Id.} at 130, 132. The techniques involved stating the problem, narrowing the inquiry by an “is not” technique, distinguishing the problem from other problems and from the absence of the problem, inquiring into possible causes, testing for the most probable alternative, and verifying the cause. \textit{Id.} at 128. They also involved an “outline-text-worksheets-cases” approach, including worksheets highlighted by keyword headings logically arranged. \textit{Id.}}
\item \footnotetext[285]{\textit{Id.} at 130-32.}
\item \footnotetext[286]{\textit{Id.} at 131 (stating that “if many can present variants on the copyrighted material, we hope that advances in its teaching will result”).}
\item \footnotetext[287]{12 F.3d 527 (5th Cir. 1994).}
\item \footnotetext[288]{\textit{Id.} at 531.}
\item \footnotetext[289]{\textit{Id.} at 533-34.}
\item \footnotetext[290]{Thus, “you reach a solution alone” was still substantially similar to “you solve the problem yourself,” and “you share the problem with relevant subordinates” was substantially similar to “you consult one-to-one with those that report to you.” \textit{Id.} at 535 (internal quotations omitted). The court reasoned that “Ah Romeo, Romeo! Why did you have to be born Romeo?” did not merely express the same concept as “O Romeo, Romeo! wherefore art thou Romeo?” but was similar in expression by being phrased as a question and having the quality of a sigh of “gasp[ing] resignation.” \textit{Id.} at 535-36. If the eight questions and five definitions are, in fact, crucial to employment of the methodology, it is hard to imagine how anyone could employ that methodology under the court’s reasoning. The questions and definitions are not offered for their aesthetic enjoyment but because their content purportedly leads to answers to real-world problems. Thus, the court should have analogized not to poetry (let alone Shakespeare) but to reference works like dictionaries or scientific or technical works, in which the scope of protection is “thin.” See discussion \textit{supra} note 81 and accompanying text. Had the court done so, the result should have been different.}
\end{itemize}
\end{footnotesize}
copyright,\textsuperscript{291} without recognition that \textit{Feist} dealt with compilations, a very different type of work. Principals of the defendant were, in fact, the original creators of the plaintiff's materials, and the court was understandably reluctant to allow them to keep the financial benefit from their exclusive license to plaintiff while using similar materials in direct competition.\textsuperscript{292} However, that is a matter that should have been covered by the license agreement,\textsuperscript{293} so there was no need for an expansive interpretation of copyright law to achieve a just result.\textsuperscript{294} The court's reasoning would apply even to third parties trying to employ the highly successful techniques of plaintiff and amounts to copyright protection of the technique itself.\textsuperscript{295}

\textsuperscript{291} Kepner-Tregoe, 12 F.3d at 536 n.20.

\textsuperscript{292} After noting the great success of the model designed by defendants but now owned by plaintiff, the court stated, "It was precisely the right to benefit from such copying that [the original creators] licensed exclusively to K-T for half a million dollars." \textit{Id.} at 537; \textit{see also id.} at 538 (stating that the original creators "signed away the right to copy, at least for commercial purposes, protectable elements of the [model]").

\textsuperscript{293} Indeed, the coverage of the license was being litigated in another jurisdiction. \textit{Id.} at 538 n.24. In an action against one of the principals not involved in the Fifth Circuit case for want of personal jurisdiction, there was no dispute that the computer program contained elements exclusively licensed to plaintiff, and the only issues were whether the license permitted the use at issue and damages. Kepner-Tregoe, Inc. v. Vroom, 186 F.3d 283 (2d Cir. 1999).

\textsuperscript{294} \textit{Cf.} ProCD, Inc. v. Zeidenberg, 86 F.3d 1447, 1454 (7th Cir. 1996) ("A copyright is a right against the world. Contracts, by contrast, generally affect only their parties..."). The \textit{ProCD} court incorrectly treated the shrinkwrap license at issue as a two-party contract for purposes of federal pre-emption by the Copyright Act. Dennis S. Karjala, \textit{Federal Preemption of Shrinkwrap and On-Line Licenses}, 22 U. DAYTON L. REV. 511, 537-39 (1997). However, the basic point that copyright is a set of exclusive rights valid against all comers while contract rights affect only the contracting parties is generally correct. When a contract governs the issue in dispute, there is no need for courts to expand copyright or other intellectual property rights to achieve a just result.

\textsuperscript{295} The court stated that the processes and questions could have been packaged differently and gave one example where a "may or may not" process could have been divided into two separate processes. Kepner-Tregoe, 12 F.3d at 537. However, the opinion gives no reason to be confident that this "repackaging" would be as effective a teaching tool. In fact, there is good reason to be skeptical about the court's conclusion. Learning that one "may or may not subordinate's" at the same time helps fix the two choices related to the same problem in the student's mind, whereas presenting them as separate processes may obscure the relationship between the two. In any event, courts are not equipped to make such decisions, even with the benefit of expert testimony about effectiveness, of which there was none in this case. That is the reason for allowing incremental improvements of these types and letting the market determine effectiveness. The defendants' model in this case did actually seek to improve the basic program by adding four questions to the original eight in the plaintiff's package. However, the court drew exactly the wrong inference, thinking that it showed other ways of approaching the problem of teaching managerial decisionmaking (so that it was unnecessary to copy plaintiff's approach) rather than that incremental improvement of this type is the norm for advances in teaching effectiveness. \textit{Id.}

\textit{Palmer v. Braun}, 287 F.3d 1325, 1334 (11th Cir. 2002), involved an allegation of copyright infringement in course materials designed to teach students to achieve increased consciousness. The structure of the two sets of materials was similar, and many of the verbal exercises involved were taken verbatim (or nearly so), used in the same exercises, and intended to achieve the same results. \textit{Palmer}, 287 F.3d at 1334. The court upheld the district court's denial of a preliminary injunction, recognizing that although the defendant used nearly identical language for the same purpose as the plaintiff, the language might, upon full trial, be shown to be accurately characterized as unprotected processes. \textit{Id.} at 1335. To the extent that the purpose of the exercises could be served by other phrases, however, the
At issue here is the scope of protection in a particular class of literary work, namely, textbooks and similar works designed for teaching. Many of the early decisions discussed above not only failed to distinguish clearly between patent and copyright, but they also often failed to make appropriate distinctions for different types within the general class of "literary works." In fact, it is now well established that copyright protection is broader for works of literary fiction than it is for historical, biographical, scientific, and similar works. Analogizing books adopting teaching methodologies, explicitly or implicitly, to novels, rather than these more narrowly protected classes of literary works, is no more justified than making the same analogy for computer programs. Nevertheless, the case law supplies abundant and long-standing authority for the proposition that the organization of a textbook, even an organization that makes it a more effective teaching device, is protected by the copyright in the book, only somewhat tempered after Baker v. Selden by recognition of the need to

court suggested that plaintiff's collection of them would be protected (even if individually the merger doctrine might deny protection). Id. Again we see the incorrect notion of a compilation to justify copyright protection for a functional work. See discussion supra note 182. Plaintiff designed, advertised, and taught his course as one that would achieve a specific functional goal, namely, increasing consciousness. Plaintiff evidently thought that his exercises were of sufficient value to justify litigating the issue of their protection. By what standard can the district court on remand determine whether other phraseology would work as well as that of the inventor of the system, who likely knows (and has been fine-tuning) its effectiveness better than anyone? The court should treat the materials as a literary work and determine infringement on that basis, subject to the limitations of § 102(b). If these exercises are an incrementally improvable methodology for achieving the desired result, they should be held to be copyright-protected processes.

296 See discussion supra notes 271-77 and accompanying text.


[T]here is no societal interest in many variants on a single theme or plot, nor is there the likelihood that by extending broad protection, entry to the market for literary works will be foreclosed. But with respect to the useful arts, there is a societal interest in having many offer the art in the marketplace. Our economy functions best under competition.


298 I have long maintained that the well accepted narrow scope of protection for scientific and technical works calls for similar treatment of computer programs, leaving protection restricted to the literal program code and slavish translations of literal code. E.g., A Coherent Theory, supra note 13, at 72-73; Copyright Protection, supra note 35, at 989.
channel functional works toward the patent regime. *Feist*’s emphasis on creative selection and arrangement as the basis for copyright originality in a compilation has given courts the rhetorical basis for ignoring *Baker*’s channelling principle, and it is not surprising to see courts, like the Fifth Circuit in *Kepner-Trego*, use it to achieve results that they deem fair. These results, however, extend copyright into the domain of patent, and courts might be less inclined to adopt such extensions if they were aware that these methodologies are patent subject matter.299

H. *Standardized Tests for Psychological or Intellectual Attributes*

Computer programs represent the one example where Congress has decided that directly functional subject matter—works that control the operation of electronic computers without human intervention—should be protected by copyright rather than patent. While computer programs can be improved through incremental change—and, under the standard proffered here, should be subject to the patent paradigm—Congress decided that the danger of misappropriation through fast and inexpensive electronic digital copying outweighs the cost of requiring later programmers to do their own coding without reliance on existing code written by others.300 Hence, copyright was expressly applied to a directly functional work.301 Standardized tests aimed at measuring intellectual or psychological attributes of human beings represent a second example of a functional work for which copyright protection on anti-misappropriation grounds may be appropriate.

Tests that measure psychological or intellectual attributes are functional in that they serve as a measuring tool, and are not offered for the purpose of conveying the information in which they are phrased. Imagine, for example, a future device similar to a positron emission tomography (“PET”) scanner that permits direct observation and measurement of such

299 The district court in *Carabio* did, in fact, recognize that the problem-solving techniques involved in that case were in the domain of patent. *Carabio*, 203 U.S.P.Q. at 132. Whether any patents should have issued for any of the techniques involved is another question. See discussion supra note 267.

300 Most computer programs result from a straightforward application of standard programming principles, so nonobvious advances in coding are rare, even though a completed complex program can be very expensive in both time and money to develop. *Relative Roles*, supra note 10, at 65.

301 This should cause no major interpretive problems as long as we understand the antis misappropriation rationale for deviating from our traditional division of labor between patent and copyright, based on functionality, and thereby properly limit the scope of protection. The vulnerability of program code to misappropriation is the sole legitimate justification for treating computer software as copyright subject matter. Because no one has yet shown that any other element of a computer program, such as its interfaces or its SSO, is similarly vulnerable, the scope of the program copyright should be limited to literal program code and slavish translations of program code. See A Coherent Theory, supra note 13, at 66-77, 116; *Relative Roles*, supra note 10, at 50-56. Interpreting the appropriate scope of protection is not the only problem associated with the copyright protection of computer software, however. There is also the issue of copyright’s extremely long term of protection. See discussion supra note 93 and accompanying text.
human attributes. No one would doubt the functionality of such a device, or argue that it constituted copyright rather than patent subject matter. Standardized tests seek to do the same thing, using words instead of radiation as the probe into the human psyche. Therefore, there is no principled reason for refusing to treat such tests as patent subject matter.

Design and creation of standardized tests involves much creative thought and a good deal of hard work, from selecting the test objectives, test items, and item response style to insuring reliability (does the test consistently give the same result for the same person?) and, most important, validity (do the test results correlate with what the test is trying to measure?). Like most computer program code, however, most such tests are designed and implemented by application of well understood principles, so the nonobviousness requirement of patent law might be difficult to surmount (at least in principle). Moreover, while a properly validated test could probably pass the utility requirement of patent law, stating precisely in the claims and specification just what the invention is will often present a challenge. Simply claiming the entire test as a single claim runs the risk that a competitor could eliminate or change a few questions and, after reconfirming reliability and validity, have a noninfringing test at a significantly reduced development cost. On the other hand, if no specific question stands as the “heart and soul” of the test, patent claims on specific questions will not be of much value (even if they can be shown to have utility independent of their use together with the other questions that comprise the validated test as a whole).

Copyright protection for the literal language of standardized test questions may therefore be justified on grounds of anti-misappropriation. As

\[\text{Copyright and Misappropriation, supra note 50, at 922-23.}\]

The “printed matter” exception, if it still exists and if it applied to these measurement tests, might constitute such a reason. However, as in In re Lowry, 32 F.3d 1579 (Fed. Cir. 1994), the printed matter cases do not properly apply. Lowry noted that the printed matter cases considered claims treating the invention as arrangements of printed lines or characters intelligible only by humans. Lowry, 32 F.3d at 1583. They did not apply in Lowry because the information there was processed not by humans but by computers. Id. With measurement tests, the test questions are, indeed, initially processed by human minds, but the invention is in judging objective aspects of their personalities from their reaction to this processing. For patent law purposes, the methodology is indistinguishable from injecting a patient with a radioactive isotope designed to reveal specific physiological characteristics. Consequently, we need not address the question of whether the printed matter exception remains viable in other contexts.

\[\text{Emily Campbell, Comment, “Testing” the Copyright Clause: Copyright Protection for Educational and Psychological Tests, 69 Neb. L. Rev. 791, 804 (1990).}\]

Proper validation likely satisfies the requirement for objective verification that the test indeed measures what it claims to measure. See discussion supra notes 106-14, 212 and accompanying text.

\[\text{Properly validated tests aim to measure human attributes. See, e.g., Applied Innovations, Inc. v. Regents of the Univ. of Minn., 876 F.2d 626, 627-28 (8th Cir. 1989); Educ. Testing Servs. v. Katzman, 793 F.2d 533, 543 (3d Cir. 1986); Rubin v. Boston}\]
in the case for computer programs, the anti-misappropriation goal and the absence of effective patent protection also inform the scope-of-protection analysis. Because no one knows exactly how or why a given test measures what it does, every change in question wording, or even question order raises doubts about previous measurements of the test’s reliability and validity. Standardized tests have little value until their validity and reliability have been shown. Because both showings are costly and time-consuming, competition through the use of paraphrased questions does not have the same potential for undercutting price in (unfair) competition with the original in the primary market for the test (institutions that use the test to measure attributes of applicants or members). Therefore the test for infringement by works competing in the primary market should be narrow, looking for verbatim copying or very close paraphrasing.

Moreover, this reasoning argues for allowing much more copying in the secondary market for practice and review courses. Otherwise the original test maker has an unfair advantage in that secondary market. The secondary market is comprised of the student test-takers themselves. They are not interested in validity of the test (once the student is accepted by a college, say, the test is no longer a factor in success or failure there) but they are very interested in reliability, in the sense that the tests they practice on are the same as the one they will take for real. Even minor changes in wording can change reliability, so forcing non-copyright-owning test preparation services to reword questions that the copyright owner can freely use in the same market gives an unfair advantage to the copyright owner outside the primary market that supplied the incentive for design of the test in the first place. At this point, our traditional anathema to copyright protection of function should come back into play.

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307 This distinguishes measurement tests from most of the other works considered in this Article, because it means that these works are not incrementally improvable in the same way that these other functional works are. Thus, protecting them under copyright is not an exception to the general principle presented herein in the same way that computer programs are an exception. As our understanding of human psychology improves, we may develop better and more predictive theories for how to measure these human characteristics by means of verbal question-and-answer tools. That deeper understanding will likely allow incremental improvement in a way that today’s trial-and-error approaches do not. When this occurs, we will almost surely be better off denying copyright protection for these tools and returning to the patent paradigm for the protection of functionality.

308 Different considerations would apply to questions that the original test maker seeks to keep secret for purposes of reuse. In that case, use by the competitor in the secondary market would destroy the value of the questions in the primary market. Campbell, supra note 305, at 830. Moreover, with respect to those questions, the original test maker would have no advantage in the secondary test preparation market, because he would not use the questions in that market.

309 Campbell, supra note 305, at 820, recognizes the functionality of these kinds of test questions but concludes that the availability of different forms of tests and questions to measure the same attributes calls for denying the application of Baker v. Selten to them. She applies the same reason to sec-
Advances in psychology are likely to further blur the patent/copyright borderline. Consider, for example, music therapy: If someone comes up with a particular set of notes that demonstrably has a salutary effect on health—say, the proverbial cancer cure—the methodology should be considered patent subject matter.\footnote{310} Equally, it should be denied status as copyright subject matter, at least insofar as it is applied to its medical purpose. Whether the notes are chosen pursuant to an established psychological theory or they are simply the result of a lucky guess is not relevant to the subject matter question. At some point, of course, we may simply have to abandon the idea of having two major paradigms and find a system that better accommodates works that can no longer be classified according to the functionality/information dichotomy.\footnote{311} As long as we can make the distinction, however, between information and function, the lesson of \textit{Baker v. Selden} is that patent must prevail over copyright for functional works.

A similar analysis applies to standardized tests used as measuring tools. As test makers better understand the underlying human psychology, they are likely to become better at devising specific questions from scratch, rather than applying the hit-and-miss approach generally taken to date. At some point, someone will likely find a set of questions that very closely approximates the “best” that can be done. It may well be that the specific wording of many of those questions will, in fact, be optimal, in that changing the wording even slightly changes the reliability or validity of the test. At this point, the incremental improvement rationale should come back into force, and later test creators should be allowed to borrow even literal language from unpatented tests where that language is necessary for test effectiveness.\footnote{312} This follows from normal merger analysis as well as the abstraction/filtration/comparison approach of \textit{Computer Associates v. Altai}.\footnote{313}

\footnote{310} The healing power of music in general has already received some coverage in the popular press. See Oliver Sacks, \textit{When Music Heals Body and Soul}, \textsc{Parade Magazine}, Mar. 31, 2002, at 4. At the present time, however, music seems to be chosen for each patient according to that person’s past musical experiences to evoke dormant meanings and emotions. \textit{Id.} Each piece of music used in the therapy in such situations remains information, to which the copyright paradigm should continue to apply. If a therapist designs a collection of musical pieces for a particular patient, however, copyright protection for the “compilation” would seem inappropriate, because it would prevent another therapist from using the collection either in continued therapy for that patient or as a starting point for putting together therapeutic collections for other patients with similar symptoms and musical experiences.

\footnote{311} Professor Reichman has long been arguing for moving beyond patent/copyright bilateralism. See supra note 9 and sources cited therein.

\footnote{312} See supra note 307.

\footnote{313} 982 F.2d 693, 706-07, 710 (2d Cir. 1992).
I. Miscellaneous “Systems”

Parts numbering systems have been the subject of several reported cases. In *Toro Co. v. R & R Products Co.*,\(^{314}\) the Eighth Circuit denied copyright protection to a set of numbers that plaintiff had created to identify for replacement purposes individual parts for its lawn care machines.\(^{315}\) The result was correct, but the ground for the decision was that the numbering system was “arbitrary and random,” as opposed to a system that used symbols according to a meaningful pattern; consequently, it lacked the necessary copyright originality.\(^{316}\) This reasoning invites courts to protect creatively designed parts-numbering systems, thereby inhibiting competition in the market for copyright-protected replacement parts by making it difficult for competitors to inform consumers concerning which parts from the competitors will meet their needs. Copyright in the numbering system thus becomes a backdoor mode of protection for the replacement parts themselves, which if unpatented lie outside the bounds of intellectual property protection.\(^{317}\)

In *Southco Inc. v. Kanebridge Corp.*,\(^{318}\) a federal district court accepted the *Toro* invitation to conclude that a parts-numbering system for industrial fasteners that was the result of creative thought satisfied the originality requirement and was copyright-protected.\(^{319}\) The court issued a temporary injunction against a competitive manufacturer that referred to plaintiff’s numbers in order for customers to make product comparisons.\(^{320}\) The Third Circuit reversed the lower court decision, noting that the defendant was not, in fact, using plaintiff’s *system* but only specific numbers derived by

\(^{314}\) 787 F.2d 1208 (8th Cir. 1986).
\(^{315}\) Id. at 1210.
\(^{316}\) Id. at 1213.
\(^{317}\) The Tenth Circuit adopted the reasoning of *Toro* in *Mitel, Inc. v. IQTel, Inc.*, 124 F.3d 1366, 1373 (10th Cir. 1997). At issue was a set of command codes for a telephone call controller device. *Mitel*, 124 F.3d at 1368. Plaintiff Mitel dominated the market for such devices and defendant IQTel sought to compete much as Borland had sought to compete with market leader Lotus in *Lotus Development Corp. v. Borland International, Inc.*, 49 F.3d 807 (1st Cir. 1995)—namely, by creating a set of its own, more extensive command codes but offering a “Mitel compatible” mode that allowed users already familiar with the dominant Mitel system to use the IQTel device without significant retraining. Mitel made the fundamental error of insisting that its command codes were chosen arbitrarily, so the reasoning of *Toro* would deny protection. *Mitel*, 124 F.3d at 1373-74. Unfortunately, the Tenth Circuit expressly refused to follow the better reasoning of the First Circuit in *Lotus* that the system was, in any event, excluded from copyright protection under § 102(b). *Id.* at 1372. Indeed, the court actually concluded that a part of the codes, called the “descriptions,” did satisfy the originality requirement because they were determined through the exercise of creativity in assigning real-world choices (e.g., the number of seconds a line was to be activated in response to a given command) to the ten digits between zero and nine. *Id.* at 1374. As to these choices, the court held that copyright was not infringed, despite originality and copying, because they constituted *scènes à faire*. *Id.* at 1374-76.

\(^{319}\) Id. at 1493.
\(^{320}\) Id. at 1492.
applying that system and that such numbers lacked originality because they were wholly determined by the system. The Third Circuit distinguished Toro on the ground that Toro was decided at least in part on the “sweat of the brow” doctrine that was later rejected by the Supreme Court in Feist; and it distinguished American Dental Association’s protection of a taxonomy of dental procedures by pointing to the creative assignment of numerical values to dental procedures through a process involving written proposals, debate, editing, and voting. The Third Circuit in Southco expressly reserved the question of whether the system created by Southco was excluded from copyright protection under § 102(b). While the court thus rectified an egregious lower court decision protecting a creatively designed parts-numbering system, it did not resolve the nagging problem that remains from cases like Toro and American Dental that such methodologies for presenting information might be copyright-protected in certain circumstances notwithstanding § 102(b).

In addition to the Tenth Circuit’s decision in Autoskill, other courts have found various “systems” protectible where they are invoked or associated with the user interface of a computer program. For example, a federal district court in Interactive Network, Inc. v. NTN Communications, Inc., concluded that certain elements of the scoring system for an interac-

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322 Id. at 153-54. The court also distinguished Mitel’s finding of originality for the assignment in the “descriptions” of the digits between zero and nine to values chosen by the Mitel designers. Id. at 154-55; see also supra note 317. The Southco system allowed no creative choices at all to be made once the mechanical attributes of a particular fastener were given. Southco, 258 F.3d at 154.
323 See discussion supra notes 238-43 and accompanying text.
324 Southco, 258 F.3d at 156.
325 Id. at 152 n.6.
326 Montgomery County Association of Realtors, Inc. v. Realty Photo Master Corp., 878 F. Supp. 804 (D. Md. 1995), aff’d, 91 F.3d 132 (4th Cir. 1996) (unpublished opinion), did not cite Toro but applied the same reasoning in holding copyright protectable a real estate multiple listing service directory. Montgomery, 878 F. Supp. at 808-10. The defendant offered photographic services to the members of the plaintiff Association that involved taking pictures of the houses listed for sale to supplement the verbal information in the listings. Id. at 808-09. In order to do this, defendant gained daily access to the database using a member’s access code and identified the new listings, after which defendant photographed the properties and sent the digitized images to defendant’s own customers. Id. (Defendant also provided its customers with copies of the plaintiff’s contract forms, which might have been another ground for copyright infringement, but the court did not discuss this issue.) Id. at 809. Copyright protectability was predicated on “marketing puffery” in the listings that the court concluded should not be treated as unprotected factual information (but query whether the plaintiff Association was the actual author of this puffery) and on the “unique and elaborate system of abbreviations” that it used to organize its database. Id. at 810. Neither the district court opinion nor the Fourth Circuit’s per curiam affirmation considers the possible relevance of § 102(b) to this “system.” Id. at 809-10; Montgomery, 91 F.3d at 132. See also discussion supra note 33.
327 Autoskill, Inc. v. Nat’l Educ. Support Sys., Inc., 994 F.2d 1476, 1497 (10th Cir. 1993); see also discussion supra note 280.
tive game played in conjunction with televised sports events were chosen arbitrarily and were therefore protected by copyright. And the district court opinion in *CMAX/Cleveland, Inc. v. UCR, Inc.* is replete with references to defendant’s copying of plaintiff’s “system” and even the design of the system, together with observations that system design is the most creative and intellectually demanding phase of software development. Infringement was based on the court’s determination that elements of plaintiff’s program design were the foundation of similar elements in defendant’s program.

One of the more egregious examples of system protection is presented by the remand decision to the district court in *Atari Games Corp. v. Nintendo of America, Inc.* This case involved a “lock and key” system that allowed only cassettes using the system to be played with the Nintendo hardware. While the court conceded that § 102(b) allowed Atari to copy elements of the system necessary for current compatibility, copying elements that were currently unused was infringement, even though copying may have been necessary to assure forward compatibility should Nintendo come out with new versions of its players in the future. This completely misunderstands the nature of § 102(b)’s denial of copyright protection to “systems.” Here the “system” does at least two things: It requires currently used cassettes to pass a given series of tests in order to be played on the Nintendo hardware, and it also allows Nintendo to change the tests in the future in a way that will assure forward compatibility to all cassettes that incorporate every element of its system. A system of accounting that reserves some blank categories to allow for easier expansion in the future still includes those blank categories as part of the system. Reproducing the entire system should have been permissible under copyright, provided that its functions were implemented as much as possible through independent coding.

329 Id. at 1404-05.
330 804 F. Supp. 337 (M.D. Ga. 1992). This case involved a license of plaintiff’s software designed to facilitate operations of “rent to own” companies. Id. at 340. Defendant obtained a copy of the program apparently under at least partially false pretenses and used that copy to generate the various screen images produced by the program. Id. at 342-45. A code generator was then used to produce new code that would generate the same images on the screen. Id. at 343.
331 Id. at 344 n.3.
332 Id. at 355. Because of the slavish nature of the copying even of the screen design, a finding of infringement was not inappropriate. Still, the decision shows the lengths to which courts will go in their effort to stanch what they see as a misappropriation of someone’s time, effort, or money. See A Coherent Theory, supra note 13, at 83-85 (discussing the CMAX decision).
333 30 U.S.P.Q.2d 1401 (N.D. Cal. 1993) (remanded from Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832 (Fed. Cir. 1992)). I am indebted to Professor Lemley for reminding me of this decision.
334 Id. at 1403.
335 Id. at 1406-07, 1409.
IV. MUST WE CHOOSE BETWEEN PATENT AND COPYRIGHT FOR FUNCTIONAL PROCESSES?\textsuperscript{336}

It was argued in Part III, by reference to a number of information-delivery methodologies and systems, that courts are too willing to protect functional methodologies as nonliteral elements of the copyright-protected works from which the methodologies are discernible. The suggested remedy, in most cases, was to treat the methods or systems in question as patent subject matter and concede patentability if the patent hurdles of anticipation, obviousness, demonstrable utility, and clear specification can be surmounted, subject to the limitation that abstract ideas and laws of nature, as well as traditional information works of art, music, and literature,\textsuperscript{337} are still excluded. There may well be many cases, however, where society will reap the benefit of the advance even without offering the incentive of patent law.\textsuperscript{338} United States intellectual property law is incentive based. That is, we recognize patent and copyright rights for the purpose of encouraging the creation and public distribution of desirable works; reward to the author or inventor is a simply a means of achieving that end.\textsuperscript{339} The question,

\textsuperscript{336} Part IV is my response to some penetrating questions raised by Professor Vince Chiappetta, for which I am most grateful.

\textsuperscript{337} See discussion supra note 26 and accompanying text.

\textsuperscript{338} Standardized taxonomies by medical and dental associations likely fall into this category. See supra note 245 and accompanying text. Patents in the competitive arts may be another. See Chiappetta, supra note 18, at 320-24; Raskind, supra note 19, at 92-93. Sports moves, too, would seem to be unlikely candidates for patents. Every major competitor has more than enough incentive to try to think of ways to improve performance. One need only witness the number of hours of training put in by Olympic hopefuls. Moreover, at least at the professional level, the relevant governing associations would likely ban any move that was not fairly licensed to all competitors. It would make no more sense to allow only Dick Fosbury to use his famous Flop in the high jump than it would to allow the inventor of the glass pole to be the sole participant permitted to use that advance in pole vaulting. The event simply would no longer be interesting to spectators. That likelihood reduces the expected monetary return from a potential patentee's exclusive rights.

\textsuperscript{339} See, e.g., Fogerty v. Fantasy, Inc., 510 U.S. 517, 524 (1994) ("The primary objective of the Copyright Act is to encourage the production of original literary, artistic, and musical statement for the good of the public."); Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., Inc., 499 U.S. 340, 349 (1991) ("The primary objective of copyright is to reward the labor of authors, but [t]o promote the Progress of Science and useful Arts." (citations omitted); Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 146 (1989) ("From their inception, the federal patent laws have embodied a careful balance between the need to promote innovation and the recognition that imitation and refinement through imitation are both necessary to invention itself and the very lifeblood of a competitive economy."); Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984) ("The monopoly privileges that Congress may authorize are neither unlimited nor primarily designed to provide a special private benefit. Rather, the limited grant is a means by which an important public purpose may be achieved."); Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975) ("The immediate effect of our copyright law is to secure a fair return for an 'author's' creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good."); Graham v. John Deere Co., 383 U.S. 1, 9 (1966) (reviewing with approval Jefferson's view that '[t]he patent monopoly was not designed to secure to the inventor his natural right in his discoveries. Rather, it was a reward, an inducement, to bring forth new knowledge.'); United States v. Paramount Pictures, Inc., 334 U.S.
then, is whether there are not some classes of functional processes or methodologies for which categorical denial of both patent and copyright protection is justified, even for works within those classes that otherwise meet the conditions specified by one of those two regimes.

The first part of my response to this question stems from the entire discussion of Part III of this Article, which demonstrates the inappropriateness of copyright for functional works, as defined via the Copyright Act's definition of a "useful article," including systems and processes that are practically applied to achieve a useful result as informed by the concept of incremental improvability.\textsuperscript{340} Denying copyright protection for functional processes and methodologies, regardless of their degree of creativity, is much more important than insuring that a given process or methodology gets a fair hearing under patent law's utility, anticipation, and obviousness tests. If we could be confident of our ability to educate the courts to restrain their "restitutionary impulses"\textsuperscript{341} so that they would simply deny copyright protection to functional processes, much of the battle would be won. In principle, moreover, there should be little reason for a copyright court to care whether denial of patent protection is based on the substantive standards of patent law (verifiable utility, nonanticipation, nonobviousness, definite claims, understandable specification) or on a categorical decision that patents are simply not available for that class of work (a subject matter limitation). Copyright courts should recognize that these works are not copyright-protectable, even if they are elements contained in or implemented by works that are copyright protected, and should leave such works to their fate under the patent and trade secret regimes.

Our confidence that we can educate the courts to deny copyright protection to functional processes, however, must be tempered by our empirical observation of the strength of the restitutionary impulse in copyright courts. The examples given in Part III show its vibrancy well over 100 years after Baker v. Selden should have quelled it. The real question therefore boils down to whether recognition of all functional processes and methodologies as patent subject matter (subject always to the substantive limitations concerning what patent subject matter is indeed patentable) will reduce this restitutionary impulse in copyright courts and, if so, whether this benefit would be outweighed by creating even bigger mess in the patent arena than we manage to clean up on the copyright side.

\textsuperscript{340} See discussion supra notes 38, 58-71 and accompanying text.

\textsuperscript{341} See discussion supra note 130.
Insofar as restraining the restitutionary impulses of copyright courts is concerned, I believe there is, in fact, a difference between the substantive limitations of patent law and a subject matter limitation. If something is patent subject matter, a copyright court can easily understand that the patent regime applies, and if the patent regime in a particular case provides no protection, that is purely a question for patent law, the PTO, and the patent courts. If a creative element of a copyright-protected work is categorically excluded as patent subject matter, however, the court must face the question of whether to allow the apparent free-riding that the intellectual property regime has created or simply to stretch copyright to rectify what appears to be an unjust taking. "Hard cases make bad law" is a catch phrase that has rarely been more applicable.

What are the risks of treating all functional systems and methodologies as patent subject matter, patentable if they comply with patent's substantive requirements? A major risk is creating a twenty-year monopoly where none was necessary in order to induce the desired level of creativity. Certainly, strong arguments have been made that patents are not necessary as an incentive in the area of business patents. There is also legitimate concern, especially in a new area of patent subject matter, that numerous "bad" patents will issue. It is difficult to evaluate these arguments, because their resolution depends on empirical information that nobody has or is likely to get. Both seem to me, however, to apply generally to patent law and not just to functional systems and processes. Professor Lemley has convincingly argued that increasing the resources of the PTO will not be cost-effective in improving patent validity determinations, so we should reconcile ourselves to using the judicial system to weed out "bad" patents. The incentive question, too, seems difficult to resolve on a category-by-category basis. Even with respect to well established patent subject matter categories, both the PTO and the courts vary their interpretations in specific cases by taking advantage of the discretion available in both the validity and infringement analyses.

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342 The Baker court followed precisely this line of reasoning: "Whether the art [Selden's accounting system] might or might not have been patented, is a question which is not before us." Baker v. Selden, 101 U.S. 99, 104 (1879).
343 The Briggs court was explicit about this. Briggs v. N.H. Trotting & Breeding Ass'n, Inc., 191 F.Supp. 234 (D.N.H. 1960); see discussion supra note 33.
344 See Chiapetta, supra note 18, at 320-24; Raskind, supra note 19, at 92-93.
345 See, e.g., Laurie & Beyers, supra note 107, at 238; Peter Wayner, How Can They Patent That?, in COPY FIGHTS: THE FUTURE OF INTELLECTUAL PROPERTY IN THE INFORMATION AGE 221, 222 (Adam Thierer & Clyde Wayne Crews, Jr. eds., 2002).
346 Lemley, supra note 34.
347 Robert P. Merges & Richard R. Nelson, On the Complex Economics of Patent Scope, 90 COLUM. L. REV. 839, 840-41 (1990). Professor Dreyfuss has noted that the novelty and inventiveness decisions are field-dependent. Dreyfuss, supra note 19, at 268. She reasons by analogy to the chemical industry, for which a low standard of inventiveness is assertedly necessary if patents are to be available.
afforded different scopes of protection to different types of works, even within a single category of copyright subject matter, such as "literary works."\textsuperscript{348} Recognizing functionality as triggering patent (as opposed to copyright) subject matter is essentially a first-order decision that insures general application of the appropriate social policies underlying these two very different statutory schemes. Decisions on the actual scope of protection (including outright denial of protection) can then be effected in a nuanced way by courts whose analysis is informed by a rich factual background and able argument on both sides.\textsuperscript{349} The fact is that we really do not know much about how the incentives of the patent and copyright systems work.\textsuperscript{350} Nevertheless, both systems have been with us for a long time. Each could undoubtedly be improved, but few would hazard their complete elimination. In these circumstances, "common law" development through the courts on a case-by-case basis runs fewer risks than an abstract decision that some works, even though functional in the same sense as all other patent subject matter, are categorically excluded.\textsuperscript{351}

at all. \textit{Id.} at 268-69. She concludes, contrary to the argument here in this Article, that the Federal Circuit will likely adjust the standards to allow business-method patents generally. \textit{Id.} It is not obvious, however, that this conclusion follows from her premise. For one thing, if we were to decide on independent grounds that the level of patenting in the chemical industry is roughly what we think is necessary for an appropriate level of innovation, the example of the chemical industry would be supportive of the argument in the Article that courts are better at determining the appropriate balances through case-by-case analysis. Professor Dreyfuss does not assert that the level of patenting in the chemical industry is unduly high. Moreover, at a minimum, field-dependence of the inventiveness inquiry would reflect an effort by the Federal Circuit to tailor the patent standards to meet the varying needs of different industries. Whether we can do better by adopting a more abstract, categorical approach to patentability remains the central question. My own view has always been that, when we do not know what levels to set (as seems to be the case for all of patent subject matter and not just business methods), we are better off allowing the courts to try to work it out on a case-by-case basis—messy as that usually appears to laypersons. Courts do less harm when they get something wrong, and a wrong result is more easily rectified by later courts (usually by distinguishing earlier cases but eventually even by overruling them).

\textsuperscript{348} See discussion \textit{supra} note 297 and accompanying text.

\textsuperscript{349} Richard Stern has pointed out that, however nuanced the scope-of-protection decision, patent law remains more of an all-or-nothing system than copyright. Stern, \textit{supra} note 20, at 143-44. He therefore recommends adapting copyright's scenes à faire doctrine to patent law to allow even more variation in the scope of protection, for the purpose of preventing a business-method claim from preempting a business. \textit{Id.} at 151-53. Nothing herein is intended to refute these or other arguments to limit patentability or patent scope after the subject matter issue has been decided.

\textsuperscript{350} Mark A. Lemley, \textit{Reconceiving Patents in the Age of Venture Capital}, 4 J. SMALL & EMERGING BUS. L. 137, 139 (2000).

\textsuperscript{351} Categorical exclusion also creates the problem of deciding, first, what the category of excluded items is and, second, whether a particular work is within or without the category. Over the long run we might expect the courts in any event to adjust the boundaries of the category to comport with their developing sense of the appropriate balance of incentives and free use. The examples of Part III show that even a decision of the United States Supreme Court, holding that copyright does not protect "facts," was unable to staunch lower court efforts to protect factual information. The crazy-quilt development of computer programs as patent subject matter is perhaps even a better example of this point. See discussion \textit{supra} note 14. Of course, the argument in the text that major changes should generally
Professor Chiappetta has correctly pointed out that, under the Constitution, patent law in the United States must promote progress in the "useful arts," which necessarily entails making some categorical subject matter distinctions.\textsuperscript{352} Even if we include "business methods" within patent subject matter, what about "inventions" in the arenas of politics, law, sports, or even religion? Many supposed inventions in these areas will flounder on the requirement of objective verifiability or may be quite naturally classifiable as unpatentable "abstract ideas."\textsuperscript{353} Others, however, may surmount these requirements. One can imagine, for example, a new and nonobvious system of voting that demonstrably works to make elections better reflect the will of the populace in some reasonably well defined sense. Similarly, one can imagine the invention of a new golf swing that demonstrably lowers the scores of most golfers.\textsuperscript{354} One can be legitimately skeptical of the need to allow patents to issue at all in these areas.

For present purposes, the real question is whether treating works in these areas as patent subject matter is necessary or useful in stanching the trend of federal courts to protect them with copyright. Each area is likely deserving of special attention, but as a general matter I suspect the answer is "No." Individual sport or dance moves, for example, if they were protected by copyright at all, would be protected as choreographic works, and copyright in each as choreography would likely be denied because they serve as basic building blocks.\textsuperscript{355} Psychological "truths" bordering on reli-

\textsuperscript{352} Chiappetta, supra note 18, at 302-03.

\textsuperscript{353} See Thomas, supra note 17, at 54 (noting that methods of swinging baseball bats or performing dance steps involve skills developed through experience that are not repeatable nor amenable to objective evaluation).

\textsuperscript{354} Professor Dreyfuss has pointed to the Fosbury Flop, a high-jump technique that rapidly displaced the earlier methods for getting over the bar. Dreyfuss, supra note 19, at 276. Presumably that technique was sufficiently well-defined, repeatable, and verifiable in utility to qualify under the normal substantive patent standards.

\textsuperscript{355} In Horgan v. Macmillan, Inc., 789 F.2d 157, 161 (2d Cir. 1986), the court apparently accepted the definitions of choreography in the Compendium of Copyright Office Practices, that "[c]horeography is the composition and arrangement of dance movements and patterns" and "[c]horeography represents a related series of dance movements and patterns organized into a coherent whole." Horgan, 789 F.2d at 161 (citing U.S. COPYRIGHT OFFICE, Compendium II: Compendium of Copyright Office Practices §§ 450.01, 450.03(a) (1984)). Thus, individual movements would likely be denied copyright protection, by analogy to the "familiar symbols and designs" doctrine in the Copyright Office Regulations. 37 C.F.R. § 202.1(a) (2002). See, e.g., Tompkins Graphics, Inc. v. Zipatone, Inc., 222 U.S.P.Q. 49, 51 (E.D. Pa. 1983) (copying of common geometrical shapes without also copying the arrangement does not infringe copyright on books comprising a library of shapes). More fundamentally, copyright should be denied in dance movements because they are basic building
ous methodology have also been held to be unprotected by copyright. \textsuperscript{356} Similarly, perhaps because judges are lawyers and see the need for incremental progress in legal and political systems and plans, “advances” in the art of law practice have almost uniformly been denied copyright protection when their “inventors” sought to cover them by the copyright in the writing explaining or implementing them. \textsuperscript{357} If we remove the danger that these systems might fall under copyright protection, a categorical exclusion from patent subject matter as well may do no harm. \textsuperscript{358}

The question of how much harm is done by categorical exclusion of verifiably useful systems and techniques depends on whether the possibility of patents in the area in question supplies a stimulus for advance that justifies the costs of recognizing patent’s exclusive rights for a twenty-year term. No one knows the answer, and as there appear to be few actual attempts to patent advances in law, politics, religion, sports, and similar arts, we can leave the problem to another day. Following my preference to rely on narrow case-by-case judicial decisionmaking when we do not know precisely what the best course would be, I would recommend that we bear in mind the constitutional requirement that patents must promote progress in the “useful arts” and allow the courts to determine, as cases arise, whether some nonobvious and functional methodologies that are demonstrably effective in doing what their inventor claims they do nevertheless do not belong to the category of “useful arts.” The Federal Circuit has answered in the affirmative with respect to a large class of “business methods,” and the point here is that this answer in the long run will comport better with an appropriate balance in our intellectual property system than their categorical exclusion as patent subject matter would be.

blocks that should remain at the disposal of all future choreographers, even if they are newly created. See Jessica Litman, The Public Domain, 39 EMORY L.J. 965, 1014-15 (1990) (noting that copyright protection is denied even to original coined words, because they serve as basic building blocks). Sports moves, like the Fosbury Flop, should, of course, also be denied copyright protection under the functionality doctrine of \textit{Baker v. Selden} and § 102(b).

\textsuperscript{356} Arica Inst., Inc. v. Palmer, 970 F.2d 1067, 1075-76 (2d Cir. 1992) (holding that sequence of “ego fixations” illustrated in “enneagrams” in an order following a claimed “natural declension” must be taken as unalterable fact and denied copyright protection on that ground).

\textsuperscript{357} See, e.g., Cont'l Cas. Co. v. Beardsley, 253 F.2d 702, 704-06 (2d Cir. 1958) (recognizing a “thin” copyright in a legal form but not in the legal relationship that was established by execution of the form); Burk v. Johnson, 146 F. 209, 213 (8th Cir. 1906) (finding that “Articles of Association” gave no exclusive right to organize and operate under the plan disclosed); Aldrich v. Remington Rand, Inc., 52 F. Supp. 732, 735-36 (N.D. Tex. 1942) (holding that a system to facilitate the collection of taxes is unprotected).

\textsuperscript{358} Model codes and statutes, however, might be considered “inventions” in the political arena. They are functional, at least after enactment, and they can be improved incrementally. Both of these features make them unsuitable for copyright’s long term and vague scope of protection. Yet copyright courts have already shown considerable willingness to bring them under the copyright umbrella. See discussion supra notes 247-66 and accompanying text.
Digital technology will increasingly present modern society with the problem of deciding the appropriate level and type of intellectual property protection for various methodologies of gathering, organizing, and presenting information. Business methods implemented by computer program are only one example. Until we radically change the intellectual property system, one of the two major paradigms—patent or copyright—will be the choice. Given the copyright protectability of computer program code, and the implicit congressional exception of code from § 102(b) of the Copyright Act and from the functionality doctrine of Baker v. Selden, it is easy for courts to forget that § 102(b) and Baker v. Selden are both alive and well with respect to all other types of subject matter. Information is the subject matter of copyright—works that have no function other than to inform, entertain, or present an appearance to human beings. Function is the subject matter of patent—works that do have a function beyond informing, entertaining, or presenting an appearance to human beings, including methodologies for gathering, organizing, and presenting information accurately and efficiently. Many of these methodologies should not be patentable, but on grounds of anticipation, nonutility, or obviousness rather than on the ground that they do not constitute patent subject matter. Categorical exclusion as patent subject matter increases the likelihood that courts will treat such methods as a “creative” element of their implementing computer program, protected by copyright as long as other methods can be imagined that accomplish the same general result. Whatever the objections to protection of such methodologies under patent law, the broad scope and long term of copyright makes copyright protection even worse.