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# ARTICLE

# CONVERGENCE IN THE LAW OF SOFTWARE COPYRIGHT?

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## I. INTRODUCTION

Courts and commentators have spilled a great deal of ink–and paid an enormous amount in legal fees–over the last 15 years in an effort to determine the appropriate scope of copyright protection for computer software.[1] To a large extent, this debate has focused on how software

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† Assistant Professor, University of Texas School of Law. I would like to thank Rose Hagan for her advice, and Lisa Launer at HTLJ for her useful suggestions.

1. Numerous articles have tackled these issues. Among them are: David Bender, Computer Associates v. Altai: *Rationality Prevails*, COMPUTER LAW., Aug. 1992, at 1; Jack E. Brown, *"Analytical Dissection" of Copyrighted Computer Software–Complicating the Simple and Confounding the Complex*, 25 ARIZ. ST. L.J. 801 (1993); Anthony L. Clapes & Jennifer M. Daniels, *Revenge of the Luddites: A Closer Look at* Computer Associates v. Altai, COMPUTER LAW., Nov. 1992, at 11; Douglas Derwin, *It is Time to Put "Look and Feel" out to Pasture*, 15 HASTINGS COMM. & ENT. L.J. 605 (1993); Audrey F. Dickey, Computer Associates v. Altai *and* Apple v. Microsoft: *Two Steps Back from* Whelan?, 8 SANTA CLARA COMPUTER & HIGH

copying should be tested. On one side, "broad constructionists" have emphasized the need to compare the copyrighted and accused works *as a whole*, in order to give protection to the "total concept and feel" of the works. On the other side, "narrow constructionists" have urged the methodical dissection of copyrighted works into their component parts in order to determine what exactly qualifies for copyright protection.

For all intents and purposes, this aspect of the debate is over. In the last three years, virtually all the courts to consider this issue have lined up with the "narrow constructionists," engaging in "analytic dissection" of computer programs in order to determine whether any copyrightable expression has actually been copied.[2] Most commonly, this analytic dissection has taken the form of the "abstraction-filtration-comparison" test set forth in *Computer Associates v. Altai*.[3] While there are still a few courts in which the "total concept and feel" approach remains the law,

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TECH. L.J. 379 (1993); Donald F. McGahn, *Copyright Infringement of Protected Computer Software: An Analytical Method to Determine Substantial Similarity*, 21 RUTGERS COMPUTER & TECH. L.J. 88 (1995); Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045, 1074, 1082 (1989); Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1004-05 (1993); J.H. Reichman, *Electronic Information Tools: The Outer Edge of World Intellectual Property Law*, 17 U. DAYTON L. REV. 797 (1992); Jack Russo & Jamie Nafziger, *Software "Look and Feel" Protection in the 1990s*, 15 HASTINGS COMM. & ENT. L.J. 571 (1993); Symposium, *Has Look and Feel Crashed?*, 11 CARDOZO ARTS & ENT. L.J. 721 (1993); Julian Velasco, *The Copyrightability of Nonliteral Elements of Computer Programs*, 94 COLUM. L. REV. 242 (1994); Aram Dobalian, Comment, *Copyright Protection for the Non-Literal Elements of Computer Programs: The Need for Compulsory Licensing*, 15 WHITTIER L. REV. 1019 (1994); Stephen H. Eland, Note, *The Abstraction-Filtration Test: Determining Non-Literal Copyright Protection for Software*, 39 VILL. L. REV. 665 (1994); Steven R. Englund, Note, *Idea, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs*, 88 MICH. L. REV. 866, 881 (1990); Thomas M. Gage, Note, Whelan Associates v. Jaslow Dental Laboratories: *Copyright Protection for Computer Software Structure–What's the Purpose?*, 1987 WISC. L. REV. 859, 860-61; W. H. Baird Garrett, Note, *Toward a Restrictive View of Copyright Protection for Nonliteral Elements of Computer Programs: Recent Developments in the Federal Courts*, 79 VA. L. REV. 2091 (1993); Mark T. Kretschmer, Note, *Copyright Protection for Software Architecture: Just Say No!*, 3 COLUM. BUS. L. REV. 823, 837-39 (1988); David A. Lowe, Comment, *A Square Peg in a Round Hole: The Proper Substantial Similarity Test for Nonliteral Aspects of Computer Programs*, 68 WASH. L. REV. 351 (1993); Adam E. McKinney, Note, *Copyright Protection for Functional Works: Where Does the Fifth Circuit Draw the Line Between Idea and Expression?*, 47 BAYLOR L. REV. 249 (1995); Peter G. Spivack, Comment, *Does Form Follow Function? The Idea/Expression Dichotomy in Copyright Protection of Computer Software*, 35 UCLA L. REV. 723, 747-55 (1988); Jon S. Wilkins, Note, *Protecting Computer Programs as Compilations Under* Computer Associates v. Altai, 104 YALE L.J. 435 (1994).

2. *See* discussion *infra* section III.A.

3. 982 F.2d 693 (2d Cir. 1992). For convenience, I will periodically refer to this as the "filtration" or "dissection" approach.

the approach is moribund: since *Altai* was decided, no court has endorsed the broader "total concept and feel" approach.[4]

This does not mean that we can all go home, however. Rather than ending, the debate over software copyright law appears to be shifting its focus. Having finally resolved the debate that has been plaguing software copyright law since its inception, courts are discovering to their chagrin, that deciding *what* test to apply actually tells you very little about *how* to apply that test. Despite the convergence of courts on *Altai*'s filtration approach, courts remain fundamentally conflicted in deciding how broadly to protect software copyright.[5] Further, there remains a good deal of misunderstanding about what exactly it means to "abstract" and "filter" a computer program.

Part II of this Article traces the history of legal protection for computer software, beginning with trade secret protection. It discusses the relatively quick development of a rule that literal copying of computer programs is prohibited, and the more intractable problem of non-literal infringement. Part III chronicles the convergence of courts and commentators on the filtration test. It then focuses on court decisions since *Altai* which have attempted to apply this test, and concludes that there is still substantial disagreement among the courts as to how that test should work in practice. Finally, Part IV suggests a unified approach to evaluating non-literal infringement in software copyright cases. This approach focuses on exactly what is alleged to have been copied. It also acknowledges the increasing role of patent law in protecting computer software, and the role of other copyright concerns such as compatibility and fair use. The result of this unified approach is to provide relatively narrow copyright protection for computer programs in most cases of non-literal infringement. In this part, I examine some of the implications of this unified approach by looking at its effect on recent cases such as *Lotus v. Borland* [6] and *Apple v. Microsoft*.[7]

## II. THE HISTORY OF SOFTWARE PROTECTION

As is common in intellectual property law, technological development in the computer industry has outrun the pace of legal change. In the 1960s and early 1970s, federal intellectual property law did not protect computer software. As a result, software vendors attempted to protect their programs in two ways–through trade secrets laws and by

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4. Indeed, the one court which has rejected *Altai*'s filtration approach did so because it thought the protection afforded by *Altai* was too broad, rather than too narrow. *See* Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807, 815 (1st Cir. 1995).

5. *See* discussion *infra* section III.B.

6. 49 F.3d at 807.

7. 35 F.3d 1435 (9th Cir. 1994).

contract. But the vendors faced a problem: if they were selling multiple copies of a program to whomever wanted them, how could the program be a secret? The answer was that, while the program might be widely distributed, in fact all that was sold was a disk containing object code. Object code is virtually impossible for humans to read without machine assistance.[8] Because of this, some courts held quite early in the history of computer software protection that widely distributed programs could in fact retain their trade secret status.[9]

This was the purpose of the proprietary rights contract.[10] Software vendors needed proof that they were not in fact disclosing their trade secrets by selling copies to whoever wanted them. To provide such proof, they created the legal fiction that they were really licensing rather than selling their software. Because the "license" contained provisions that required customers to keep the software confidential, many courts held that the trade secrets contained therein could be protected.

As we shall see, however, the shortcomings of trade secret protection led software vendors to seek alternate avenues to protect their works.[11]

## A. Establishing Copyright Protection for Software

Copyright law was originally established to prevent the unauthorized printing of books.[12] To a large extent, the scheme of copyright protection still shows its literary roots. Copyright law was designed in order to protect physical works of creative authorship which could be *used* without being *copied*. The law's assumption that the objects of copyright protection are physical has colored the application of copyright law to computer software cases. Courts repeatedly look–often

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8. To be sure, it is possible to "reverse engineer" object code in some cases to create a kind of rough estimate of what must have been in the original source code. The process, however, is demanding and time-consuming even for expert programmers. *See, e.g.*, Andrew Johnson-Laird, *Reverse Engineering of Software: Separating Legal Mythology from Actual Technology*, 5 SOFTWARE L.J. 331 (1992).

9. Data General Corp. v. Digital Computer Controls, Inc., 297 A.2d 433, 436 (Del. Ch. 1971) (program with 500 copies sold still qualifies as a trade secret), *aff'd*, 297 A.2d 437 (Del. 1972). Courts continue to reach this result. Data General Corp. v. Grumman Systems Support Corp., 825 F. Supp. 340, 354-55 (D. Mass. 1993); Management Science of Am. v. Cyborg Systems, Inc., 1977-1 TRADE CAS. ¶ 61472 (N.D. Ill. 1977).

10. Most software contracts at this time contained proprietary rights provisions which asserted that the information contained in the accompanying computer software was proprietary to the vendor, and could not be copied or disclosed without the vendor's permission.

11. On the shortcomings of trade secret protection, *see* discussion *infra* note 127.

12. *See* ROBERT MERGES, PETER MENELL, MARK LEMLEY, & THOMAS JORDE, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE ch. IV, at 1-3 (discussing historical development of copyright law).

in vain–to the familiar physical world of copyright to find analogies to apply in the world of computer software.

The fundamental principle of copyright law is that unauthorized copying is not permitted.[13] Copying violative of the statute includes not only the literal taking of the words or expression of another, but also what is called "non-literal infringement"–the taking of the essence of the author's expression without using the author's actual words. Were copyright protection limited to literal infringement, as Judge Hand has noted, a plagiarist could "escape by immaterial variations."[14] Indeed, protection for copyrighted works extends beyond even the language or particular creative expression used, to encompass the "structure, sequence and organization" of a work,[15] and its "total concept and feel."[16] Furthermore, when copying cannot be proven by direct evidence, it may be inferred from proof of the infringer's access to the copyrighted work plus proof of substantial similarity between the two works.[17]

Not all copying rises to the level of copyright infringement, however. There are several important limits on the rights of copyright owners to protect their works. First, and most important, a copyright plaintiff must prove that the defendant has copied *protectable expression*.[18] In particular, a copyright owner may not lay claim to the *ideas* within her work, but only to her particular means of expressing those ideas.[19] Further, copyright protection does not extend to any part of the work that consists of unprotectable facts,[20] stock literary or artistic themes,[21] or expression that is not sufficiently creative or original with the copyright owner to qualify for protection.[22] Finally, copying of protectable expression is only actionable if the copying is substantial.[23]

In the computer software context, each of these basic elements of copyright law has had to be painstakingly reestablished. Even after the passage of the 1976 Copyright Act, it was not obvious to the courts that

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13. *See* 17 U.S.C. § 106(1) (1995).

14. Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930).

15. *See* Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157, 1166-67 (9th Cir. 1977).

16. *Id.* at 1167.

17. Gaste v. Kaiserman, 863 F.2d 1061, 1066 (2d Cir. 1988).

18. *See* National Comics Pubs. v. Fawcett Pubs., 191 F.2d 594, 600 (2d Cir. 1951) ("[N]o one infringes, unless he descends so far into what is concrete as to invade . . . [its] expression.").

19. *See* Baker v. Selden, 101 U.S. 99 (1879). Section 102(b) of the Copyright Act provides 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." 17 U.S.C. § 102(b) (1995).

20. Hoehling v. Universal City Studios, Inc., 618 F.2d 972, 979 (2d Cir. 1980).

21. Nichols v. Universal Pictures Crop., 45 F.2d 119, 121 (2d Cir. 1930).

22. Feist Publication v. Rural Telephone Service, 111 S. Ct. 1282 (1991).

23. *See* Jarvis v. A & M Records, 827 F. Supp. 282, 288 (D.N.J. 1993).

the copyright laws protected computer programs at all.[24] The Congressional Commission on New Technological Uses of Copyrighted Works (CONTU) recommended that the copyright statute be amended to provide protection for computer programs. CONTU's recommendations were adopted essentially verbatim by Congress in 1980.[25]

Even after the 1980 amendments, establishing copyright protection for the literal text of computer programs was a protracted process. Courts separately considered and affirmed the copyrightability of source code,[26] object code,[27] microcode or "firmware,"[28] applications programs,[29] and operating systems.[30] A similar debate occurred over the literal copyrightability of program outputs, such as video game displays.[31] In each case, courts found the literal elements of computer programs copyrightable only over vigorous opposition. Nonetheless, by the mid-1980s it had been firmly established that computer programs were "literary works" that could not be literally copied, and that program outputs were "audiovisual works" that could not be literally copied. Courts then turned to the thornier question of non-literal infringement.

## B. The Problem of Non-Literal Infringement

The difficulty with non-literal copyright infringement is that when only concepts and not actual language have been copied, courts are put to the test of distinguishing idea from expression. This is not a problem that arises only in the computer context. Indeed, Judge Learned Hand commented early and often on the arbitrariness of any such determination.[32] Two factors make the idea-expression dichotomy particularly difficult to apply in computer cases, however. First,

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24. *See, e.g.*, Apple Computer v. Franklin Computer, 545 F. Supp. 812 (E.D. Pa. 1982), *rev'd*, 714 F.2d 1240 (3d Cir. 1983).

25. *See, e.g.*, H.R. Rep. No. 1307, 96th Cong., 2d Sess. 23 (1980) U.S.C.A.A.N. 6460, 6482. The 1980 amendments changed the Copyright Act by adding a definition of "computer program" to section 101, and by adding section 117, which grants certain rights to the users of computer programs. CONTU did not, however, add computer programs to the list of protectable works, instead considering them to be both literary and audiovisual works.

26. Williams Electronics v. Artic Int'l, 685 F.2d 870, 876-77 (3d Cir. 1982).

27. *Franklin Computer*, 714 F.2d at 1247-49.

28. NEC Corp. v. Intel Corp., 10 U.S.P.Q.2d 1177, 1178-80 (N.D. Cal. 1989).

29. *Williams Electronics*, 685 F.2d at 870.

30. *Franklin Computer*, 714 F.2d at 1240.

31. Stern Electronics v. Kaufman, 669 F.2d 852, 857 (2d Cir. 1982); *see also* Manufacturers Technologies, Inc. v. Cams, Inc., 706 F. Supp. 984, 992-96 (D. Conn. 1989).

32. Peter Pan Fabrics, Inc. v. Martin Weiner Corp., 274 F.2d 487, 489 (2d Cir. 1960) ("Obviously, no principle can be stated as to when an imitator has gone beyond copying the 'idea', and has borrowed its 'expression'. Decisions must therefore inevitably be *ad hoc.*"); *see also* Nichols v. Universal Pictures Corp., 45 F.2d 119 (2d Cir. 1930) (discussing levels of abstraction at which copyrightability may be tested).

computer programs are written for a utilitarian purpose.[33] Expression in the code or structure and organization of a program is normally only incidental to that purpose. Courts must therefore identify and protect that incidental material, while leaving the functional aspects of the program free for all to duplicate. Second, computer programs are technically complex and inaccessible to the lay person, a category which includes most federal judges. Judges are therefore forced to rely on second-hand knowledge and testimony about the programming process to a far greater extent than in other literary cases.

These problems have driven a number of courts to search for rules to help them evaluate non-literal infringement in software cases. Two such rules grew to prominence early in the history of computer copyright cases. First, some courts solved the "problem" of non-literal infringement by refusing to protect computer programs against non-literal infringement at all. The clearest example of this approach was Judge Higginbotham's decision in *Synercom Technology v. University Computing Co.*[34] In that case, Synercom had designed a series of "input formats" which would accept data from users in conjunction with a program which analyzed engineering problems with the design of buildings. EDI, the defendant, wrote a program in a different language which accepted information in the same formats as Synercom's program. The court held that the sequencing and ordering of data inputs constituted the idea of Synercom's program, rather than its expression, and therefore found no infringement in the copying of those sequences.[35] Judge Higginbotham explained that "[h]ere . . . the form, arrangement, and combination is itself the intellectual conception involved. It would follow that only to the extent the expressions involve stylistic creativity *above and beyond* the bare expression of sequence and arrangement, should they be protected."[36]

*Synercom*'s conclusion was endorsed, albeit indirectly, by the Fifth Circuit's decision in *Plains Cotton Cooperative Ass'n Inc. v. Goodpasture Computer Service.*[37] That case held that the structure and organization of computer input formats could not be protected because they were determined in large part by functional considerations. The court did not expressly hold that input formats could never be protected, but it did cite the *Synercom* decision with approval.[38]

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33. *See, e.g.*, Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045, 1074, 1082 (1989).

34. 462 F. Supp. 1003 (N.D. Tex. 1978).

35. *Id.* at 1012-14.

36. *Id.* at 1014 (emphasis in original).

37. 807 F.2d 1256 (5th Cir. 1987).

38. *Plains Cotton*, 807 F.2d at 1262. The court also refused to follow the Third Circuit's decision granting broad protection to non-literal elements in Whelan Assoc. Inc. v. Jaslow

The *Synercom* approach to the non-literal infringement problem has the virtue of simplicity. Unfortunately, it also has the effect of denying copyright protection even to obviously expressive elements of a computer program, such as original compilations and designs, if an infringer copies the "look and feel" of those elements, rather than their actual implementation in code. Judge Hand's warning about plagiarism by means of "immaterial variations"[39] seems particularly apt here. Under the Fifth Circuit rule, copiers were free to take the "heart" of a computer program, including its expressive elements, a freedom they did not have with any other type of work.[40]

To avoid this problem, while still devising a rule that was easy to apply, some courts went to the opposite extreme, protecting nearly all elements of a computer program against non-literal infringement. The paradigm case of this "broad protectionism" is the Third Circuit's decision in *Whelan Associates Inc. v. Jaslow Dental Laboratory Inc.*.[41] There, the court was called upon to evaluate a claim of infringement of a custom computer program for record keeping in a dental laboratory. Whelan was a computer company that had developed the program to the specifications of its customer, Jaslow. When Jaslow developed and began marketing its own program in competition with Whelan, Whelan sued. The record indicated that Jaslow had not copied Whelan's code, but that the two programs were similar in their overall structure, sequence and organization.

The *Whelan* court began its analysis by concluding that the non-literal expressive elements of a computer program were entitled to copyright protection, citing the universal rule with regard to other types of works.[42] The court acknowledged that this result put it at odds with *Synercom*, but found that there was "no statutory basis for treating computer programs differently from other literary works in this regard."[43]

Having decided that the non-literal elements of computer programs were entitled to protection, the court set about the task of formulating a test to distinguish protectable from unprotectable elements.[44] The Court

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Dental Laboratory Inc., 797 F.2d 1222 (3d Cir. 1986), discussed *infra* notes 41-57 and accompanying text.

39. Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930).

40. *See e.g.*, Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp., 562 F.2d 1157 (9th Cir. 1977).

41. 797 F.2d 1222 (3d Cir. 1986).

42. *Id.* at 1234.

43. *Id.* at 1240.

44. While acknowledging the difficulty of such an undertaking, and Judge Hand's skepticism that the task could be accomplished at all, *see* Peter Pan Fabrics, Inc. v. Martin Weiner Corp., 274 F.2d 487, 489 (2d Cir. 1960), the Third Circuit believed that a review of

reviewed *Baker v. Selden* in detail, and drew its test from what it took as the central lesson of that case:

> [T]he purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of that idea . . . Where there are various means of achieving the desired purpose, then the particular means chosen is not necessary to the purpose; hence, there is expression, not idea.[45]

The court felt that the test it articulated would "provide the proper incentive for programmers by protecting their most valuable efforts," citing evidence that most of the cost of developing a computer program is in designing the structure and logic of the program.[46]

The court's application of its test to the case before it was straightforward. The court described the "idea" of the computer program as "the efficient management of a dental laboratory (which presumably has significantly different requirements from those of other businesses)."[47] The choice of this basic concept as "the" idea of the Dentalab program made application of the idea-expression dichotomy quite simple: "Because that idea could be accomplished in a number of different ways with a number of different structures, the structure of the Dentalab program is part of the program's expression, not its idea."[48] The court acknowledged that its approach was at odds with *Synercom*, but felt that there was no merger of idea and expression in the case before it, since the "idea" of efficiently managing a dental laboratory was separable from the many possible ways of accomplishing this goal.[49]

During the same period, a number of district courts took an approach similar to *Whelan*, at least to the extent of rejecting *Synercom* and protecting software against non-literal copyright infringement.[50] On that

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copyright law would "enable [them] to formulate a rule applicable in this case." *Whelan*, 797 F.2d at 1235.

45. *Whelan*, 797 F.2d at 1236 (emphasis omitted).

46. *Id.* at 1237. *Whelan*'s emphasis on allowing computer programmers to recoup their investment in writing the program is of questionable vitality in light of the Supreme Court's rejection of the "sweat of the brow" doctrine in Feist Publication Inc. v. Rural Telephone Service Co, Inc., 499 U.S. 340, 360 (1991). In that case, the Supreme Court made it clear that the fact that a copyright plaintiff had invested substantial effort in developing a work did not automatically entitle the plaintiff to copyright protection. Investment of time and energy could not convert unprotectable elements such as facts and ideas into protectable expression. Similarly, under *Feist*, the fact that programmers invest substantial time and effort in developing the ideas or functional aspects of a program ought not give them control over those ideas or functional aspects.

47. *Whelan*, 797 F.2d at 1236 n.28.

48. *Id.* at 1236.

49. *Id.* at 1239-40.

50. *See, e.g.*, Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37, 63 (D. Mass. 1990) (protecting Lotus 1-2-3 user interface); Manufacturers Technologies v. Cams, Inc., 706 F. Supp. 984, 993 (D. Conn. 1989) (protecting user interface); Digital Communications

issue, *Whelan* remains uncontroversial to this day. Indeed, the Fifth Circuit has since reversed *Synercom* and affirmed the copyrightability of non-literal elements of computer programs.[51]

*Whelan*'s broader holdings, however, sparked a firestorm of controversy, with most commentators critical of the decision.[52] Commentators have pointed to two weaknesses in *Whelan*'s approach. First, *Whelan*'s statement of the idea-expression dichotomy as excluding protection for the idea of the program and everything necessary to that

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Assocs., Inc. v. Softklone Distrib. Corp., 659 F. Supp. 449, 455-56 (N.D. Ga. 1987) (protecting "total concept and feel" of program, but rejecting protection for screen displays); Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127, 1133 (N.D. Cal. 1986) (protecting the "overall structure" of the program); SAS Inst. Inc. v. S & H Computer Systems, Inc., 605 F. Supp. 816, 829-30 (M.D. Tenn. 1985) (copying of program structure constitutes copyright infringement).

Many of the cases which accepted *Whelan*'s first premise–that the non-literal elements of computer programs were protectable–did not go on to find infringement, however. These cases suggested a much narrower approach to copyright protection, based on the functional nature of most software. *See, e.g.*, Telemarketing Resources v. Symantec Corp., 12 U.S.P.Q.2d 1991 (N.D. Cal. 1989) (no infringement of screen displays); Q-Co Industries, Inc. v. Hoffman, 625 F. Supp. 608, 615-16 (S.D.N.Y. 1985) (similarities between program structures were dictated by function, and did not constitute copyright infringement).

51. *See* Kepner-Tregoe, Inc. v. Leadership Software, Inc., 12 F.3d 527, 536 n.20 (5th Cir. 1994).

52. *See, e.g.*, 3 MELVILLE NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 13.03(F), at 13-62.34; Douglas K. Derwin, *It Is Time to Put "Look and Feel" Out to Pasture*, 15 HASTINGS COMM & ENT. L.J. 605 (1993); Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045, 1074, 1082-83 (1989); Steven R. Englund, Note, *Idea, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs*, 88 MICH. L. REV. 866, 881-82 (1990); Thomas M. Gage, Note, Whelan Associates v. Jaslow Dental Laboratories: *Copyright Protection for Computer Software Structure–What's the Purpose?*, 1987 WIS. L. REV. 859, 860-61; W.H. Baird Garrett, Note, *Toward a Restrictive View of Copyright Protection for Nonliteral Elements of Computer Programs: Recent Developments in the Federal Courts*, 79 VA. L. REV. 2091 (1993); Mark T. Kretschmer, Note, *Copyright Protection for Software Architecture: Just Say No!*, 1988 COLUM. BUS. L. REV. 823, 836-39; Peter G. Spivack, Comment, *Does Form Follow Function?: The Idea/Expression Dichotomy in Copyright Protection of Computer Software*, 35 UCLA L. REV. 723, 747-55 (1988). The American Committee for Interoperable Systems, an organization of computer companies opposed to broad copyright protection, filed an amicus brief in Computer Associates v. Altai critical of the *Whelan* approach. *See* Brief Amicus Curiae of American Committee for Interoperable Systems, Computer Associates v. Altai, 982 F.2d 693 (2d Cir. 1992) (No. 91-7893).

In addition to these contemporaneous sources, numerous commentators writing after the Second Circuit's decision in Computer Assoc. v. Altai, Inc., 982 F.2d 693 (2d Cir. 1992), have endorsed that decision and rejected *Whelan*. For a partial list of these commentators, *see infra* note 78.

Indeed, even some advocates of broad protectionism have failed to endorse *Whelan*, opting instead for other approaches. *See, e.g.*, Jon S. Wilkins, Note, *Protecting Computer Programs as Compilations Under* Computer Associates v. Altai, 104 YALE L.J. 435 (1994) (suggesting that computer programs might be protected as original compilations of unprotectable elements). An argument such as Wilkins' in effect rejects the *Whelan* approach, since it acknowledges the wisdom of evaluating individual elements for copyrightability.

idea is accurate but arguably incomplete. The court left the definite impression that this central idea was the *only* thing that could not be protected by copyright. As subsequent cases have noted, under traditional copyright rules protection does not extend to facts, "scenes a faire," elements dictated by efficiency or functional considerations, patentable processes, material drawn from other works or from the public domain, and expression which has "merged" with the underlying idea.[53] While certain language in *Whelan* indicates that the court recognized that facts and scenes a faire at least were unprotectable,[54] the court apparently considered them unprotectable only to the extent that they had merged with the overarching idea of the work.[55]

The second problem with *Whelan* is its definition of the unprotectable idea. As Judge Hand noted long ago, ideas can be defined at different levels of abstraction.[56] Choosing the level at which an idea is defined is critical to determining how much expression will be protected; the more general the idea, the more "expressive" material will fit under its umbrella. As an admittedly extreme example, the *Whelan* court might have defined the idea of the Dentalab program very generally (say, "to make money"). Under the test the court articulates, if making money is the idea, anything not necessary to that idea is expression protectable by the copyright laws. Since a dental laboratory is not the only way to make money, the concept of a dental laboratory itself would be protectable "expression" that could not be copied under this test. Most people would agree that this is an absurd result, but it does demonstrate the power that defining the idea has in determining the scope of copyright protection.

Unfortunately, the *Whelan* court's definition of the idea of the Dentalab program is not much narrower than our hypothetical. By defining the idea as "efficiently managing a dental laboratory," the court opened the way for any particular means of (efficient) management to be protected. For example, since it is presumably possible to manage a dental laboratory efficiently without using a computer program, Whelan's *entire program* is arguably merely an "expression" of the overarching idea of efficient management. Certainly, the court translates its broad idea into broad protection for the structure of the Dentalab

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53. *See, e.g.*, Gates Rubber Co. v. Bando Chem. Indus. Ltd., 9 F.3d 823, 836-38 (10th Cir. 1993). For a more detailed discussion of these issues, *see infra* section III.A.

54. *See Whelan*, 797 F.2d at 1236-37 (acknowledging the rule that scenes a faire and facts are unprotectable, but concluding that this is true only when the facts or the scenes a faire "merge" with the single idea of the program).

55. *Id.*

56. *See* Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930).

program, even though the court conceded that similar structures could also be found in competing, presumably non-infringing programs.[57]

In short, the problem with *Whelan* is the same as the problem with *Synercom*, from the opposite side. In both cases, the courts sacrificed accuracy in separating protectable from unprotectable material in order to achieve a workable rule that is easy to apply. Neither *Synercom*, which protects virtually none of a program except the literal code, nor *Whelan*, which protects virtually the entire program, actually address the difficult problem of how to separate idea from expression in the context of computer software. Instead, both lines of authority do their best to pretend the problem does not exist.

## III. CONVERGENCE: MODERN TRENDS IN SOFTWARE COPYRIGHT

### A. *Altai* and the Filtration Bandwagon

It was not until 1992 that an appellate court tackled this tough problem head on. In *Computer Associates Int'l, Inc. v. Altai, Inc.*,[58] Computer Associates ("CA") sued Altai for allegedly copying portions of its operating system scheduling program in order to make Altai's program compatible with CA's. An Altai employee had originally copied portions of CA's code directly; when Altai found out about the copying, it rewrote its program so that it did not include any CA code. Nonetheless, CA claimed that the rewritten Altai program infringed CA's copyright in the non-literal elements of its program.[59]

The Second Circuit began its discussion by agreeing with *Whelan* and its progeny that copyright protection extends to the non-literal elements of computer programs.[60] However, the court said, "that conclusion does not end our analysis. We must determine the *scope* of copyright protection that extends to a computer program's non-literal structure."[61] In this second determination, the *Altai* court diverged substantially from the method of analysis used in *Whelan*. The *Altai* court labeled *Whelan*'s application of the idea-expression dichotomy "suspect

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57. *Whelan*, 797 F.2d at 1238-39. Of course, it does not follow from the argument that the protection granted in *Whelan* was too broad that the *result* in that case was necessarily incorrect. It may well be that, had the court defined the idea more narrowly, it would still have found the programs substantially similar in their copyrighted expression.

58. 982 F.2d 693 (2d Cir. 1992).

59. *Altai*, 982 F.2d at 699-700. On appeal, Altai did not contest the district court's finding that its old program infringed CA's copyright, or its liability for damages for this past infringement. *See id.* at 701.

60. *Id.* at 702-03.

61. *Id.* at 703 (emphasis added).

because it is so closely tied to what can now be seen–with the passage of time–as the opinion's somewhat outdated appreciation of computer science."[62]

In its place, *Altai* adopted a three-step procedure that has come to be known as the abstraction-filtration-comparison approach.[63] Rather than treating the non-literal elements of a computer program as a unified whole, the *Altai* approach uses "analytic dissection"[64] to break the program into its constituent parts, and then evaluates the copyrightability of each of those parts. The first step in this process is to break the "structure" of a computer program into different levels of abstraction, based on Judge Hand's test in *Nichols v. Universal Pictures Corp.*[65] At its lowest level, the structure of a computer program is based around a set of individual mathematical instructions. At progressively higher levels, these instructions are organized into subroutines, subroutines into routines, routines into software modules, modules into higher-level modules, and these high-level modules into the overall function of the program.[66]

Once this separation has been completed, the *Altai* test proceeds to "filter" the unprotectable elements out of the program structure at each level of abstraction.[67] Like *Whelan*, the *Altai* court concluded that the underlying idea of a program, and any structural elements necessary to that idea, are unprotectable. In addition, *Altai* identified several factors to be considered in the filtering process. First, the court removed from consideration elements of CA's program structure which were dictated by efficiency, on the grounds that the idea and expression have merged where "efficiency concerns . . . so narrow the practical range of choice as to make only one or two forms of expression workable options."[68] Because computer programs are utilitarian works, and the goal of computer programmers is normally to implement their ideas efficiently, this is a significant limitation on the protection afforded program structure, particularly at higher levels of abstraction.

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62. *Id.* at 706.

63. *Id.* at 706-711.

64. *See* Brown Bag Software v. Symantec Corp., 960 F.2d 1465, 1475 (9th Cir. 1990) (endorsing "analytic dissection" of computer programs).

65. 45 F.2d 119, 121 (2d Cir. 1930).

66. *See generally* Englund, *supra* note 1, at 897-98.

67. *Altai*, 982 F.2d at 707-10. It is worth noting that *Altai* does not simply choose one level of abstraction as appropriate. Rather, it evaluates the program at *each* level of abstraction in order to identify any protectable expression residing at that level. At the same time, as Judge Hand noted in *Nichols*, "there is a point in this series of abstractions where they are no longer protected, since otherwise the [author] could prevent the use of his 'ideas.'" 45 F.2d at 121.

68. *Altai*, 982 F.2d at 707-08; *see also* Menell, *supra* note 1, at 1052 (copyright protection does not extend to portions of a program dictated by efficiency).

Second, the *Altai* court removed from consideration the programming equivalent of *scenes a faire*–standard programming techniques and elements of the program dictated by external factors. In particular, the court identified five elements of computer programs that were not entitled to protection under the *scenes a faire* doctrine.[69] Finally, *Altai* held that factual material or material taken from the public domain could not be included in the copyrightable expression of the program.[70]

Once the unprotectable elements had been filtered out of the program, what remained was "a core of protectable expression."[71] The court applied the traditional infringement test to this core expression, comparing the equivalent structures in the two works to determine whether they are substantially similar and, if so, whether any copying was substantial.[72] Under this approach, a plaintiff will be successful only if she can demonstrate substantial copying of protectable expression.

*Altai* rejected CA's argument that its filtration approach would inadequately protect computer programmers and therefore would be a disincentive to computer research and development. Even if that were true, the court said, the Supreme Court's decision in *Feist Publication v. Rural Telephone Service*[73] makes it clear that "substantial effort alone cannot confer copyright status on an otherwise uncopyrightable work."[74] The court noted that "[t]he interest of the copyright law is not in simply conferring a monopoly on industrious persons, but in advancing the public welfare through rewarding artistic creativity, in a manner that permits the free use and development of non-protectable ideas and processes."[75]

While the *Altai* filtration approach was criticized by large computer companies who are commonly copyright plaintiffs–IBM's lawyer called it "a legal Chernobyl";[76] Apple's lawyer said it "complicated the simple and confounded the complex"[77]–it has found rapid acceptance among the

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69. *Altai*, 982 F.2d at 709-10. The five factors are: "(1) the mechanical specifications of the computer on which a particular program is intended to run; (2) compatibility requirements of other programs which with a program is designed to operate in conjunction; (3) computer manufacturers' design standards; (4) demands of the industry being serviced; and (5) widely accepted programming practices within the computer industry." *Id.*, citing 3 NIMMER ON COPYRIGHT, *supra* note 52, at 13-66 to 13-71.

70. *Altai*, 982 F.2d at 710.

71. *Id.* The court also refers to this core expression as the "golden nugget." *Id.*

72. *Id.* at 710-11.

73. 111 S. Ct. 1282 (1991).

74. *Altai*, 982 F.2d at 711.

75. *Id.*

76. Clapes, *supra* note 1, at 11.

77. Brown, *supra* note 1, at 801.

courts.[78] In the two and one-half years since *Altai* was decided, the Second Circuit's filtration approach[79] has been endorsed by the Federal Circuit,[80] the Fifth Circuit,[81] the Ninth Circuit,[82] the Tenth Circuit,[83] and district courts in the Eleventh Circuit.[84] *Altai* has also been endorsed by courts in Canada,[85] the United Kingdom,[86] and France.[87] Only the First Circuit has questioned the filtration approach, and they complained that the test was too broad rather than too narrow.[88] Certainly, no court has followed *Whelan* since *Altai* was decided.

To be sure, application of the filtration test has not been uniform in the courts. The test has acquired some accouterments (and perhaps greater sophistication) on its way to general acceptance. The Tenth Circuit decision in *Gates Rubber* is particularly notable in this regard. In that case, the court acknowledged that "[a]pplication of the abstractions test will necessarily vary from case-to-case and program-to-program. Given the complexity and ever-changing nature of computer technology, we decline to set forth any strict methodology for the abstraction of computer programs."[89] Nonetheless, the court identified six levels of "generally declining abstraction": (1) the main purpose of the computer program, (2) the structure or architecture of a program, generally as represented in a flowchart, (3) "modules" which comprise particular program operations or types of stored data, (4) individual algorithms or data structures employed in each of the modules, (5) the source code

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78. In addition, the weight of academic commentary on *Altai* has been favorable as well. *See, e.g.*, Brief Amicus Curiae of Copyright Law Professors, Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807 (1st Cir. 1995) No. 93-2214 (24 copyright law professors endorsing *Altai* decision), *reprinted in* 16 HASTINGS COMM. & ENT L.J. 657 (1994); Bender, *supra* note 1, at 1; Derwin, *supra* note 1, at 605; McGahn, *supra* note 1, at 131; Peter S. Menell, *The Challenges of Reforming Intellectual Property Protection for Computer Software*, 94 COLUM. L. REV. 2644 (1994); Reichman, *supra* note 1, at 831; Velasco, *supra* note 1, at 242; Dobalian, *supra* note 1, at 1073; Eland, *supra* note 1, at 699.

79. In addition to *Altai* itself, see Softel v. Dragon Medical, 1992 WL 168190 (S.D.N.Y. 1992).

80. Atari Games Corp. v. Nintendo of Am., 975 F.2d 832, 839 (Fed. Cir. 1992).

81. Engineering Dynamics v. Structural Software Inc., 26 F.3d 1335, 1342-43 (5th Cir. 1994); Kepner-Tregoe, Inc. v. Leadership Software, Inc., 12 F.3d 527, 536-37 (5th Cir. 1994).

82. Apple Computer v. Microsoft Corp., 35 F.3d 1435, 1442-43 (9th Cir. 1994).

83. Gates Rubber Co. v. Bando Chem. Indus., 9 F.3d 823, 834 (10th Cir. 1993); Autoskill v. Nat. Educ. Support Sys., 994 F.2d 1476, 1487-98 (10th Cir. 1993).

84. Mitek Holdings v. Arce Eng. Co., 864 F.Supp. 1568, 1577-1578 (M.D. Fla. 1994); CMAX/Cleveland, Inc. v. UCR, Inc., 804 F. Supp. 337, 352-54 (M.D. Ga. 1992).

85. Delrina Corp. v. Triolet Sys., 9 B.L.R.2d 140 (Ont. Ct. Just. 1993); Matrox Elect.. Sys. v. Gaudreau, 1993 R.J.Q. 2449, 2457-58 (Mont. Ct. Just. July 28, 1993).

86. John Richardson Computers v. Flanders & Chemrec Ltd., [1993] 497 (Ct. Chanc. Feb. 19, 1993).

87. Computer Assoc. Int'l v. S.A.R.L. Faster, No. 519/95, reported in COMP. L. RPTR., May 1995.

88. Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807, 815 (1st Cir. 1995).

89. Gates Rubber v. Bando Chem. Indus., 9 F.3d 823, 834 (10th Cir. 1993).

which instructs the computer to carry out each necessary operation on each data structure, and (6) the object code which is actually read by the computer.[90] The court used these levels of abstraction to facilitate its analysis of the program at issue.

The *Gates Rubber* court also gave further content to the filtration part of the *Altai* analysis. The court filtered out six unprotectable elements: ideas,[91] the processes or methods of the computer program,[92] facts,[93] material in the public domain,[94] expression which has "merged" with an idea or process,[95] and expression which is so standard or common as to be a "necessary incident" to an idea or process.[96] Finally, the court indicated that comparison of the protected elements of a program should be done on a case-by-case basis, with an eye toward determining whether a substantial portion of the protectable expression of the original work has been copied.[97] The *Gates Rubber* court specifically rejected a comparison of the "total concept and feel" of the two programs, on the grounds that that test "was developed in different contexts and it is not very helpful in comparing similarities among protected components of computer codes."[98]

*Gates Rubber* adds a great deal of detail to the framework established by *Altai*. The Tenth Circuit's gloss on *Altai* has itself received substantial support among the courts adopting the filtration approach.[99] In spite of the differences in the particular filtration test applied by different courts, it is now possible to say with some certainty that the Third Circuit's

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90. *Id.* at 835.

91. *Id.* at 836. The court noted that the basic idea of a program, and the individual modules themselves, will almost never be protected by copyright law. *Id.*

92. *Id.* at 836-37. The court cited the legislative history accompanying section 102(b) of the Copyright Act, which clearly indicates that the actual processes or methods used in a computer program are not entitled to copyright protection. *Id.* The court noted that processes were most commonly found in the program architecture, module structure, and algorithms used. *Id.* at 837.

93. *Id.* Facts are most commonly found in a program's data structures, or in the actual code used to implement a particular process. *Id.*

94. *Id.* at 837-38.

95. *Id.* at 838.

96. *Id.* This is the "scenes a faire" doctrine. The court held that such standard devices in computer programs include "those elements of a program that have been dictated by external factors," such as hardware and software standards, specifications, or compatibility requirements, customer design specifications, and basic industry practices. *Id.*

97. *Id.* at 839.

98. *Id.* at 839 n.15.

99. *See, e.g.*, Engineering Dynamics v. Structural Software Inc., 26 F.3d 1335, 1342-43 (5th Cir. 1994) (adopting the Tenth Circuit approach explicitly); *cf.* Apple v. Microsoft, 35 F.3d at 1443 (applying the Ninth Circuit's own version of the filtration test, called "analytic dissection," relying on Brown Bag Software v. Symantec Corp., 960 F.2d 1465, 1475 (9th Cir. 1992), *cert. denied*, 113 S. Ct. 198 (1992)).

approach in *Whelan* is dead. Between 1992 and 1994, the federal courts converged on the filtration approach exemplified by *Altai* and *Gates Rubber*.

## B. Difficulties in Applying *Altai*

Given the time, money and energy that have been poured into the debate over how to evaluate non-literal infringement claims in software cases, it would be reasonable to assume that judicial resolution of that debate would go a long way towards determining the scope of protection actually afforded computer software. Reasonable, but wrong. The Fifth Circuit observed in *Engineering Dynamics* that its adoption of the filtration approach "should not convey a deceptive air of certitude about the outcome of any particular computer copyright case."[100] Indeed, a quick review of the recent cases applying the filtration approach indicates that filtration is not particularly well correlated with "narrow" copyright protection. Not only have at least two courts given a broad scope of protection to programs while applying the filtration test,[101] but one court has criticized the *Altai* filtration approach for giving too much protection to programs.[102]

To be sure, several courts applying the filtration test have concluded that the particular programs at issue are deserving of little if any protection against non-literal infringement. For example, in *Altai*, the Second Circuit affirmed the district court's determination that the OSCAR program "effectively contained no protectable expression whatsoever."[103] Not surprisingly, therefore, it also agreed that similarities between the few remaining protectable elements were de minimis and did not warrant a finding of copyright infringement.[104] Similarly, the *Gates Rubber* court found that most elements of the program structure and command operations were not protectable, although it did remand to the district court for further evidence on similarities between the screen menus and sorting criteria in the two programs, as well as to consider the effect of programming errors common to the two programs.[105] And in *Apple*, the Ninth Circuit held that virtually none of the elements of Apple's graphical user interface (GUI) were protectable in the circumstances of that case.[106] While it did consider the program as a whole protectable as a

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100. *Engineering Dynamics*, 26 F.3d at 1343.

101. *See infra* notes 108-111 and accompanying text.

102. Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807, 815 (1st Cir. 1995).

103. Computer Associates Int'l v. Altai, Inc., 982 F.2d 693, 714 (2d Cir. 1992).

104. *Id.* at 714-15.

105. Gates Rubber v. Bando Chem. Indus., 9 F.3d 823, 842-46 (10th Cir. 1993).

106. Apple Computer v. Microsoft Corp., 35 F.3d 1435, 1446-47 (9th Cir. 1994). In *Apple*, the court's copyright analysis was complicated by the fact that Apple had licensed many of the features of its Macintosh GUI to Microsoft and Hewlett-Packard. *Id.* at 1439-

compilation, that compilation received only thin copyright protection and was not infringed by the defendants.[107]

On the other hand, some courts that have adopted the filtration approach (at least in name) have nonetheless granted broad protection to the non-literal elements of computer software. For example, the district court in *CMAX* held that the organization of the blank forms designed to collect information from the user of the program was not dictated by function or by industry custom, and therefore was protectable.[108] And the Fifth Circuit's decision in *Kepner-Tregoe* defines expression quite broadly in finding non-literal infringement.[109] Still other courts have taken a similarly broad approach in applying the filtration test, but with certain reservations or limitations. For example, in *Atari*, the Federal Circuit held that Nintendo's instruction code for its lockout chip–in essence, a method of generating the proper data stream to unlock the Nintendo system–was copyrightable because the instructions themselves were arbitrary, and therefore not dictated by function.[110] At the same time, the court seemed to suggest that Atari would not have infringed Nintendo's copyright if it had used one of the "multitude of different ways" of generating the data stream necessary to unlock the Nintendo console.[111]

To complicate matters further, the First Circuit's recent decision in *Lotus v. Borland* takes another tack altogether, eschewing the filtration test entirely. In that case, Lotus had sued Borland for copying the menu command hierarchy of its 1-2-3 spreadsheet program. Borland admitted copying the menu structure, but both parties agreed that Borland had not taken any Lotus code. The First Circuit concluded that Lotus' menu structure was not entitled to *any* copyright protection because it was a "method of operation," which section 102(b) of the Copyright Act says is unprotectable. The *Lotus* court criticized *Altai* as "misleading because, in instructing courts to abstract the various levels, it seems to encourage them to find a base level that includes copyrightable subject matter that, if literally copied, would make the copier liable for copyright infringement."[112] The filtration test "obscures the more fundamental

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41. As a result, the Ninth Circuit had no opportunity to consider whether many elements of the GUI were protectable at all.

107. *Id.* *Cf.* Wilkins, *supra* note 1, at 462-64 (suggesting such a test for protectable compilations, but with an extremely easy threshold for finding infringement).

108. CMAX/Cleveland, Inc. v. UCR, Inc., 804 F. Supp. 337, 354-55 (M.D. Ga. 1992).

109. Kepner-Tregoe v. Leadership Software, 12 F.3d 527, 535-36 (5th Cir. 1994). *See* McKinney, *supra* note 1, at 258-263 (criticizing the Fifth Circuit approach in detail).

110. Atari Games Corp. v. Nintendo of America, 975 F.2d 832, 840 (Fed. Cir. 1992).

111. *Id.*

112. Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807, 815 (1st Cir. 1995).

question of whether a menu command hierarchy can be copyrighted at all."[113]

This wide divergence between results achieved by courts applying the filtration test cannot be explained by the nature of the programs at issue. Courts have reached different results with respect to protection for GUIs and menu-driven I/O formats,[114] with respect to copying of compatibility elements,[115] and with respect to the copying of program structures.[116] Nor can the amount of copying alone explain this divergence. Some courts have found no infringement in spite of substantial copying,[117] while other courts have found infringement even in cases of minimal copying.[118]

It would seem, then, that the apparent harmony evident in recent decisions is illusory. When the details of each case are examined, there appear to be significant differences between the results courts reach using the filtration test. While the courts have finally agreed on some first principles in software copyright law, much more obviously remains to be done. In the next section, I offer some suggestions.

## IV. BEYOND THE PROTECTION DEBATE–PROPOSALS

To some extent, the differing outcomes courts have reached in applying the filtration test may simply reflect their political predispositions towards "high" or "low" protectionism.[119] Some courts may simply be more willing to find infringement than others given the same set of facts. But I do not think that application of the filtration test need be entirely ad hoc. In this section, I propose a unified approach to the abstraction-filtration-comparison test which I hope will resolve much of this difficulty.

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113. *Id.*

114. *Compare* Apple v. Microsoft, 35 F.3d at 1447 *and Lotus*, 49 F.3d at 817-18 (interfaces found unprotectable in whole or part) *with Engineering Dynamics*, 26 F.3d at 1347 *and CMAX*, 804 F. Supp. at 355-56 (interfaces found protectable).

115. *Compare Altai*, 982 F.2d at 714-15 (after filtration, virtually no part of the CA-ADAPTER program was protectable) *with Atari*, 975 F.2d at 845 (Nintendo lockout chip contains nonfunctional, protectable expression).

116. *Compare Altai*, 982 F.2d at 707-09 *and Gates Rubber*, 9 F.3d at 836-37 (program structures uncopyrightable to the extent that they are dictated by function) *with Kepner-Tregoe*, 12 F.3d at 536-37 (program structures protectable if multiple ways of structuring the program exist). *See* McKinney, *supra* note 1, at 259 (criticizing *Kepner-Tregoe* for failing to engage in a detailed application of the abstraction test).

117. *See, e.g., Lotus*, 49 F.3d at 817-18; *Altai*, 982 F.2d at 714-15; *Gates Rubber*, 9 F.3d at 842.

118. *See Atari*, 975 F.2d at 845; *CMAX*, 804 F. Supp. at 355-56.

119. On these terms, see Paul Goldstein, *Derivative Rights and Derivative Works in Copyright*, 30 J. COPYRIGHT OFF. SOC'Y 209, 211 (1983).

### A. The Abstract Nature of Abstraction

The "abstraction" part of the *Altai* test has caused a good deal of consternation among lawyers and courts attempting to apply the test. Lawyers argue over whether programs are in fact written using the levels of abstraction described in *Altai*. Courts adjust the test to fit their particular view of programming. Lawyers and courts then tangle again over *which level of abstraction* is the proper one to apply in their case, how the levels apply to unusual parts of programs (like graphical user interfaces and other screen displays), and even whether the copying at that level of abstraction was literal or not.[120]

All of this debate misconstrues and unnecessarily complicates the abstraction step of the *Altai* test. The problem is that lawyers and courts take the abstraction step too literally, forgetting that it is intended to be, in fact, an *abstraction*. It is easiest to see this problem in the context in which the abstraction test was first applied–a claim of infringement of a traditional literary work.[121]

Judge Hand suggested that "[u]pon any work . . . a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. The last may perhaps be no more than the most general statement of what the [work] is about, and at times might consist only of its title . . . ."[122] For example, in the case of a book, the "lowest" level of abstraction is the text of the book itself. At higher levels of abstraction, the book might consist of a paragraph-by-paragraph outline or summary, a chapter-by-chapter outline or summary, a general description of plot and characters, and (at the highest level) the thesis of the book itself. If a book is alleged to infringe the copyrighted work, we first break the copyrighted book into "levels of abstraction"[123] and do a quick look at the accused work to see what it is that the plaintiff claims was copied.[124] If the actual text has been taken, the "abstractions" analysis merges into the test for literal infringement. But if the defendant has not copied any actual text, he may still be liable if he has copied the organization or the "texture" of the book at a higher level of abstraction.

Of course, in the literary context we all know that this "higher level of abstraction" is merely an artificial construct to help us decide the case. There may or may not be a "chapter outline" and a "paragraph outline" which were used in writing the copyrighted work. But it doesn't really

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120. *See* Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807, 815 (1st Cir. 1995).

121. Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930).

122. *Id*.

123. Actually, *Altai* abstracted the *accused* rather than the copyrighted work. *See Altai*, 982 F.2d at 707. This seems backwards given that the inquiry in copyright infringement cases should focus on finding protectable expression in the *copyrighted* work.

124. On this initial determination of what is alleged to be copied, *see* Gates Rubber v. Bando Chem. Indus., 9 F.3d 823, 833 (10th Cir. 1993).

matter. Certainly, the inquiry is not whether the defendant had access to and copied from the outline, but whether he copied *from the finished work at that particular level of generality.* Once we have identified the level (or levels) of generality at which copying is alleged to have occurred, we can proceed to the next step–filtration–to decide what parts of the copyrighted book are protectable at that level.

Unfortunately, in the computer cases everyone seems to have forgotten that the abstraction test is only a judicial construct. Programs are composed of object code, just as books are composed of words. If a copyright defendant has not copied the object code itself, the question becomes whether she has copied the program at a higher level of generality (or "abstraction"). But courts should not care whether the defendant actually had access to and copied the plaintiff's flow chart, just as they do not care whether the defendant had access to the plaintiff's paragraph outline in the literary context. The only relevant question is the level of generality at which the copying is alleged to have occurred. Once this level of abstraction is identified (and in many cases copying may be alleged at more than one level of abstraction), courts can proceed to decide how much protection the copyrighted program is entitled to at that level.

The First Circuit's decision in *Lotus v. Borland* seems to suffer from the problem of taking the abstraction analysis too literally. The *Lotus* court rejected the *Altai* test on the grounds that

> [w]hile the Altai test may provide a useful framework for assessing the alleged non-literal copying of computer code, we find it to be of little help in assessing whether the literal copying of a menu command hierarchy constitutes copyright infringement. In fact, we think that the Altai test in this context may actually be misleading because, in instructing courts to abstract the various levels, it seems to encourage them to find a base level that includes copyrightable subject matter that, if literally copied, would make the copier liable for copyright infringement . . . . We think that abstracting menu command hierarchies down to their individual word and menu levels and then filtering idea from expression at that stage, as both the Altai and the district court tests require, obscures the more fundamental question of whether a menu command hierarchy can be copyrighted at all.[125]

This argument misunderstands the *Altai* test. First, it is simply wrong to speak of "abstracting menu command hierarchies down to their individual word and menu levels." Indeed, it is really wrong to speak of what Borland did as "literal copying" of the menu hierarchy. Lotus distributed object code which, in certain combinations, produces physical images on a screen which represent certain words and which have certain effects. Borland did not copy that code; rather, it wrote its own code

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125. Lotus Dev. Corp. v. Borland Int'l., 49 F.3d 807, 815 (1st Cir. 1975).

which produced similar images and had the same effects as the Lotus code. This may or may not be copyright infringement. It is not "literal" copying of the Lotus program any more than an accused book which uses the same organizational scheme as a copyrighted work, but different text in each chapter, has "literally" copied the original book. A proper application of the *Altai* approach in this context would identify the menu command hierarchy as the level of abstraction at which copying was alleged, and would then proceed to decide what *if anything* was copyrightable at that level.[126]

Of course, this is in effect precisely what the *Lotus* court did–although when it reached the "filtration" step, it determined that the entire program was unprotectable at the menu command hierarchy level. Thus, both the result and even the approach in *Lotus* are entirely consistent with the abstraction-filtration-comparison test. Unfortunately, however, the *Lotus* court's misinterpretation of that test led it to declare that it was taking a different approach.

## B. Filtration and the Role of Software Patents

Having identified the level or levels of abstraction at which copying is alleged, the next step in applying the *Altai* test is for the court to "filter out" those parts of the program which are not copyrightable at that level of abstraction. There has not been serious judicial dispute over how to apply this part of the test, although there is certainly a political debate over what and how much material should be filtered out. The *Lotus* decision, however, does raise two issues of importance in conducting the filtration inquiry. First, the majority applies the "method of operation" limitation in section 102(b) to find the Lotus 1-2-3 menu command hierarchy uncopyrightable, in effect "filtering out" the entire program at that level. Second, Judge Boudin's concurring opinion focuses on the question of whether software ought to be protected by copyright law or by patent law. As it turns out, these two issues are related. To understand how they are related requires a brief digression into the history of software patents.

In the early days of computer software, program owners seeking legal protection had very few options. Computer programs were protectable either under copyright law (in accordance with the CONTU

126. The *Lotus* court is wrong to suggest that the abstraction test implies that literal copying is always copyright infringement. In the first place, as noted above, Borland did not engage in literal copying as that term is used in *Altai*. Second, the filtration analysis must be applied at any given level of abstraction, and it is quite possible that the result of that analysis will be that *no* part of the program will be copyrightable at that level. *See, e.g.*, Apple Computer v. Microsoft Corp., 35 F.3d 1435, 1446 (9th Cir. 1994); *Gates Rubber*, 9 F.3d at 842; *Altai*, 982 F.2d at 714-15 (all finding virtually no protectable elements of the copyrighted programs at the particular levels examined).

report) or under trade secret law. Problems inherent in trade secret protection,[127] however, left copyright the only realistic way for most companies to protect their programs.

Traditionally, patent protection has not been available for computer programs. Patent protection was rejected by the Supreme Court in *Gottschalk v. Benson* on the grounds that a computer program merely recites a mathematical algorithm,[128] and that mathematical algorithms are laws of nature that do not constitute patentable subject matter.[129] Between 1972 and 1981, during the "formative years" of intellectual property protection for computer software, therefore, software designers had to reckon without the possibility of patent protection for their inventions.[130]

In 1981, the Supreme Court decided the case of *Diamond v. Diehr.*[131] That case did not reverse *Benson*, but it did adopt an intermediate position with respect to the patenting of computer programs. *Diehr* held that a process was not unpatentable merely because it recited or applied a mathematical algorithm as one of its steps. Rather, the relevant question for the Court was whether the patent claimed *nothing more than* the algorithm, or whether it added other steps to the process (or, in the case of an apparatus claim, whether the claim was limited to the implementation of the algorithm in a particular physical structure).[132] Significantly, the *Diehr* Court indicated that a process or apparatus claim was patentable even though the only inventive element of the claim was

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127. Trade secret protection normally ends when a product is publicly distributed. While some companies have attempted to evade this legal rule on the grounds that the secret is contained in unreadable object code, trade secret protection is problematic for many computer companies because it does not prohibit the reverse engineering of legally-obtained computer disks. Uniform Trade Secrets Act, § 1(4) (1985). In part because of the ability of competitors to reverse engineer a secret product, the Supreme Court has acknowledged the inherent weakness of trade secrecy when compared to other forms of intellectual property protection. Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 489-90 (1974).

128. 409 U.S. 63, 72 (1972).

129. *Id.* at 67. 35 U.S.C. § 101 by its terms contains no such limitation on patenting mathematical algorithms. Indeed, section 100 of the Patent Act would seem to extend patent protection to any "invention or discovery." Nonetheless, a venerable line of cases has denied patent protection to "phenomena of nature, . . . mental processes, and abstract intellectual concepts." *Benson*, 409 U.S. at 63.

130. To be sure, even during this period there were efforts to patent computer programs. *See, e.g.*, Parker v. Flook, 437 U.S. 584 (1978). However, these attempts were generally unsuccessful. *See* Pamela Samuelson, Benson *Revisited: The Case Against Patent Protection for Algorithms and Other Computer-Related Inventions*, 39 EMORY L.J. 1025 (1990).

131. 450 U.S. 175 (1981).

132. *Id.* at 185-188.

the algorithm, as long as some physical structure or process steps were included.[133]

The effect of *Diehr* was to exalt artful drafting above the substance of the patented invention. A new mathematical algorithm was unpatentable if it was claimed as a mathematical algorithm, but the same algorithm could be patented by attorneys smart enough to include the proper claim elements in their application.[134] By the late 1980s, the rush to patent software was on.

Today, it seems reasonably clear that software is patentable. The formalistic rules required by *Diehr* have been progressively relaxed, allowing the patenting of algorithms with only the barest tie to physical structure or process.[135] The Patent Office has issued thousands of software patents, and continues to issue more each year.[136] The Patent Office has even granted patents on bare mathematical algorithms themselves.[137] The only remaining disputes primarily concern the form software patent claims must take.[138] And even those disputes may soon

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133. *Id.*; *see also In re* Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989); *In re* Grams, 888 F.2d 835 (Fed. Cir. 1989); *In re* Abele, 684 F.2d 902 (C.C.P.A. 1982); *see* Samuelson, *supra* note 130, at 1089-90.

134. *Iwahashi* is a good example. In that case, the court held that a mathematical algorithm was patentable because the patent claimed it only as implemented in ROM format. 888 F.2d at 1375. There is no question that the algorithm alone would have been unpatentable; it is unclear today whether implementation in RAM would have been sufficient.

135. *See, e.g., id.* at 1375 (implementation in ROM); Arrhythmia Research Technology v. Corazonix Corp., 958 F.2d 1053, 1059 (Fed. Cir. 1992) (invention patentable because it results in the manipulation of physical quantities); *In re* Alappat, 33 F.2d 1526, 1545 (Fed. Cir. 1994) (en banc) (suggesting mathematical formula is patentable if it is capable of being used in a general purpose computer).

Even more recently, the Patent Office has taken the position that any computer-readable memory (including ROM, RAM, magnetic disk drives, and CD-ROMs) are statutory "articles of manufacture" if they "can be used to direct a computer to function in a particular manner." United States Dept. of Com. *Proposed Examination Guidelines for Computer-Implemented Inventions*, PTO Docket no. 95053144-5144-01 (May 31, 1995).

136. By one estimate, there are approximately 14,000 United States patents in existence that cover software. *See* Steve G. Steinberg, *Growth of US Software Patents*, WIRED, January 1995, at 54. And the Patent Office is currently issuing approximately 4,000 new software patents per year. *See* Simson L. Garfinkel, *Patently Absurd*, WIRED, July 1994, at 104, 106.

137. The most commonly cited example is Bracewell's patent on the discrete Bracewell transform, an improvement on Fast Fourier Transforms. United States Patent # 4,646,256 (Feb. 24, 1987).

138. *Compare In re* Trovato, 42 F.3d 1376 (Fed. Cir. 1994) (means-plus-function claim invalid because it did not disclose specific hardware embodiments in the specification) *and In re* Warmerdam, 33 F.3d 1354 (Fed. Cir. 1994) (rejecting process claims directed to manipulation of data structure) *with In re* Lowry, 32 F.3d 1579 (Fed. Cir. 1994) (virtual data "structure" resident in computer memory constitutes patentable subject matter).

end, since GATT requires that member nations issue patents without discriminating against particular technologies.[139]

What does the availability of software patents mean for software copyright law? There is no question that patent and copyright law can coexist in the software context.[140] In the current legal environment, a savvy lawyer will no doubt seek both patent and copyright protection for an important program. But the overlap between patent and copyright protection highlights the importance of the idea-expression dichotomy in copyright law, which serves to distinguish copyright from patent. As the Federal Circuit explained in *Atari*:

> In addition, copyright protection does not "extend to any . . . procedure, process, system [or] method of operation." 17 U.S.C. section 102(b). In conformance with the standards of patent law, title 35 provides protection for the process or method performed by a computer in accordance with a program. Thus, patent and copyright laws protect distinct aspects of a computer program. Title 35 protects the process or method performed by a computer program; title 17 protects the expression of that process or method. While title 35 protects any novel, nonobvious, and useful process, title 17 can protect a multitude of expressions that implement that process. If the patentable process is embodied inextricably in the line-by-line instructions of the computer program, however, then the process merges with the expression and precludes copyright protection.[141]

The *Atari* court's final point is critical–the scope of expression protectable under copyright law varies with the scope of protection afforded ideas under patent law. In theory, this should not be true. The patent and copyright statutes are independent, and there is no reason to believe that changes in one statute mean changes in the other. But in practice, software copyright law has been protecting "patent-like" inventions for some time. The rules of section 102(b)–against copyrighting ideas, processes, systems, etc.–have not been strictly enforced in the software context, because as a practical matter no other form of protection for the ideas and processes of a computer program was available.[142]

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139. General Agreement on Tariffs and Trade, Agreement on Trade Related Aspects of Intellectual Property Rights (GATT TRIPS), April 15, 1994, Art. 27(1) ("patents shall be available and patent rights enjoyable without discrimination as to . . . the field of technology").

140. *See, e.g.*, Atari Games Corp. v. Nintendo of Am., 975 F.2d 832, 839 (Fed. Cir. 1992).

141. *Id.* at 839-849 (citations omitted).

142. *See, e.g.*, Lotus Dev. Corp. v. Borland Int'l., 49 F.3d 807, 819 (9th Cir. 1994) (Boudin, J., concurring) ("The problem presented by computer programs is fundamentally different [from that presented by literary works] in one respect. The computer program is a means for causing something to happen; it has a mechanical utility, an instrumental role, in accomplishing the world's work. Granting protection, in other words, can have some of

Perhaps this was a bad idea from the outset. Certainly, many have argued persuasively that copyright has never been suited to protect computer software, offering numerous examples of the poor "fit" between the two.[143] Further, as Judge Boudin noted in his concurrence in *Lotus v. Borland*, "[i]t is no accident that patent protection has preconditions that copyright protection does not–notably, the requirements of novelty and non-obviousness–and that patents are granted for a shorter period than copyrights."[144] Altering copyright law rather than employing patent protection has arguably overprotected computer software, because copyright contains none of the safeguards of patent law's validity rules and examination procedures.

It doesn't really matter whether this expansion of copyright law was wise or not, however. As software patents gain increasingly broad protection,[145] whatever reasons there once were for broad copyright protection of computer programs disappear. Much of what has been considered the copyrightable "structure, sequence and organization" of a computer program will become a mere incident to the patentable idea of

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the consequences of patent protection in limiting other people's ability to perform a task in the most efficient manner.").

That this expanded view of copyright law in the software context has become institutionalized is amply demonstrated by the arguments of certain copyright scholars, who decry the recent trend away from broad copyright protection on the grounds that it will fail to reward programming efficiency. *See* Anthony Clapes, *Confessions of an Amicus Curiae: Technophobia, Law and Creativity in the Digital Arts*, 19 U. DAYTON L. REV. 903 (1994); Miller, *supra* note 1, at 1004-05. Copyright law, of course, was never intended to reward efficiency.

143. *See, e.g.*, Peter S. Menell, *Tailoring Legal Protection for Computer Software*, 39 STAN. L. REV. 1329 (1987); A. Samuel Oddi, *An Uneasier Case for Copyright Than for Patent Protection of Computer Programs*, 72 NEB. L. REV. 351 (1993); Pamela Samuelson et al, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308 (1994); Mary Mills, Note, *New Technology and the Limits of Copyright Law: An Argument for Finding Alternatives to Copyright Legislation in an Era of Rapid Technological Change*, 65 CHI.-KENT L. REV. 307 (1989).

144. *Lotus*, 49 F.3d at 819 (Boudin, J., concurring).

145. While most software patent cases to date have dealt with the issue of patentability under 35 U.S.C. § 101, the language of these cases is relevant to issues of patent scope as well. In particular, software patents written as means-plus-function claims have breadth in direct proportion to the range of hardware implementations that are allowed as "equivalents" to the structure disclosed in the patent specification. As that range of equivalents expands, arguably including virtual data "structures" resident entirely in computer memory, *see In re* Lowry, 32 F.3d 1579, 1583 (Fed. Cir. 1994), software patents will gradually expand to cover the implementation of an idea in any digital form.

The clearest example of this trend is the saga of *In re* Beauregard, 53 F.3d 1583 (Fed. Cir. 1995). IBM sought to patent "software contained on a floppy disk" as an article of manufacture. The Board of Patent Appeals and Interferences originally rejected this claim as directed to nonstatutory subject matter, but later admitted before the Federal Circuit that it now considered such matter statutory. For a description of the history of this case, see Richard H. Stern, *Solving the Algorithm Conundrum: After 1994 The Federal Circuit Patent Law Needs a Radical Algorithmectomy*, 22 AIPLA Q.J. 167, 195-206 (1994).

the program or of one of its potentially patentable subroutines. Broad copyright protection of the sort afforded in *Whelan* will become both unnecessary to software owners and problematic from the standpoint of intellectual property theory.

Arguably, the decision in *Lotus v. Borland* is merely an application of this principle. The court's decision adds a new item–"methods of operation"–to the list of things which must be filtered out before comparing the copyrighted and accused works. This decision is consistent with the idea suggested above: that courts have in the past been giving some copyright protection to ideas and functional program elements, but that they should cease doing so now that programs are eligible for patent protection.[146] Indeed, Judge Boudin's concurrence explicitly focuses on the patent-copyright distinction, arguing that the structure, sequence and organization of computer programs are particularly suited to patent rather than traditional copyright protection.

The availability of the patent option affects virtually all cases involving non-literal infringement or the copyright protection of program elements at a high level of abstraction. In these cases, the existence of software patents should make courts less willing to extend the coverage of copyright law to ideas and the functional elements of programs, and more willing to engage in a strict filtration analysis.

## C. Comparison: Sliding Scales and Virtual Identity

The third step in evaluating a claim of copyright infringement is to compare the copyrightable elements of the program at the relevant level of abstraction (if any) with the corresponding elements in the accused program. The law in this area is underdeveloped. Two important factors in this analysis are the nature and amount of the copying that has occurred. "Copying" software can mean many different things. It might mean duplication of the object code of a program–the production of a true physical copy of the program. It might mean copying of source code to create a program that runs on a different operating system. It might mean copying of the basic instruction sets used by the original program. It might mean copying one or more subroutines from the program, or writing a program with a similar structure, or even writing a program to do the same thing as the original.[147]

To complicate matters further, *how much* is copied may vary along with the level of abstraction at which it is copied. Thus, an accused

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146. Certainly, the buttons on a VCR (the analogy the *Lotus* court uses to describe the menu command hierarchy, *see Lotus*, 49 F.3d at 817) would be eligible for patent but not copyright protection.

147. *Cf.* Gates Rubber v. Bando Chem. Indus., 9 F.3d 823 (10th Cir. 1993) (discussing the levels of abstraction of computer programs).

infringer may copy material verbatim, creating an identical work. Alternatively, he may make "immaterial variations" in the work, producing a virtually but not precisely identical copy. More significant differences between the two works may result in a "copy" which is substantially similar to the original, but which also contains nontrivial differences from the original program. Finally, an accused infringer may "copy" small pieces of a work as part of a wholly different work, creating minor similarities between otherwise different works. Different types of copying are represented on the axes of Figure 1. On the vertical axis, I have presented a variant of the "levels of abstraction" identified by *Altai* and *Gates Rubber* for use in software cases. On the horizontal axis, I have presented a rough measure of the amount of copying that has occurred.

None of these gradations are captured by the *Altai* filtration test. This is not because the filtration test is flawed, but because the test is largely directed at identifying protectable expression (the copyrightability portion of the infringement analysis), not at comparing a copyrighted work to an accused work. When the comparison step is considered, it becomes evident that the nature of the copying matters.

First, the level of abstraction at which the copying occurs is important, because computer programs generally receive more copyright protection at low levels of abstraction than at high levels. Other things being equal, a finding of copyright infringement is more likely against a company that copies $x$ percent of the object code of a program than against a company that copies the same percentage of the basic structure of the program. This is true because object code is more likely to contain protectable expression than is basic program structure.

Second, it also matters how similar the two programs are. If the accused program is identical to the copyrighted program, it is almost certainly infringing, since if the copyrighted program contains *any* protectable expression, that expression has been copied. By contrast, if there are only minor similarities between the two programs, it is much less likely that a court will find infringement, since minor similarities are more often accidental or the result of unprotectable common elements.

These two principles interact. Identical copying of object code is unquestionably copyright infringement, except perhaps in the most unusual case.[148] By contrast, minor similarities between the purpose or basic structure of two programs almost certainly do not constitute copyright infringement. Between these extremes, analysis of copying

148. For example, it is possible that two instructions written in different high-level computer languages will produce identical object code sequences, since the high-level languages must be translated into machine-readable form, and the instructions to the computer will be the same. In this way, it is possible (though unlikely) that different source code will produce identical object code. Of course, in that case there has not really been "copying" at all, but rather independent creation resulting in striking similarity.

must take place on a sliding scale: the higher the level of abstraction at which similarities are found, the closer the works must be before a court should find copyright infringement. I have depicted this sliding scale in a rough, stylized way as the diagonal line in Figure 1 located in the appendix at page 34.

This sliding-scale, "organic" analysis of copying finds significant support in other areas of copyright law. In *Hoehling v. Universal City Studios*,[149] for example, Hoehling was the author of a non-fiction book analyzing the destruction of the German zeppelin "Hindenburg" by fire in New Jersey in 1938. He advanced a particular theory to explain the Hindenburg explosion–that the Hindenburg was sabotaged by a crewman on board. When Universal made a movie of the explosion which featured a crewman-saboteur, Hoehling sued for copyright infringement.

The Second Circuit rejected Hoehling's claim:

> [W]here, as here, the idea at issue is an interpretation of an historical event, our cases hold that such interpretations are not copyrightable as a matter of law. In *Rosemont Enterprises, Inc. v. Random House, Inc.*,[150] we held that the defendant's biography of Howard Hughes did not infringe an earlier biography of the reclusive alleged billionaire. Although the plots of the two works were necessarily similar, there could be no infringement because of the "public benefit in encouraging the development of historical and biographical works and their public distribution." To avoid a chilling effect on authors who contemplate tackling an historical issue or event, broad latitude must be granted to subsequent authors who make use of historical subject matter, including theories or plots.[151]

The court went on to note a caveat, however:

> We are aware, however, that in distinguishing between themes, facts, and *scenes a faire* on the one hand and copyrightable expression on the other, courts may lose sight of the forest for the trees. By factoring out similarities based on non-copyrightable elements, a court runs the risk of overlooking wholesale usurpation of a prior author's expression. A verbatim reproduction of another work, of course, even in the realm of nonfiction, is actionable as copyright infringement. Thus, in granting or reviewing a grant of summary judgment for defendants, courts should assure themselves that the works before them are not virtually identical. In this case, it is clear that all three authors relate the story of the Hindenburg differently.[152]

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149. 618 F.2d 972 (2d Cir. 1980).
150. 366 F.2d 303 (2d Cir. 1966), *cert. denied*, 385 U.S. 1009 (1967).
151. *Hoehling*, 618 F.2d at 978 (citations omitted).
152. *Id.* at 979-80 (citation omitted).

Other courts have adopted the "virtual identity" standard as well, in the artistic as well as the factual context.[153]

*Hoehling*'s two lessons–that we must not "lose sight of the forest for the trees," and that virtual identity may constitute copyright infringement even in circumstances in which substantial similarity does not–have direct applicability to the software context. Indeed, several courts have adopted a similar approach in applying the filtration test.

The most obvious example is the Ninth Circuit's decision in *Apple Computer v. Microsoft*.[154] There, the court engaged in abstraction and filtration of the graphical user interfaces in copyrighted and accused programs. After filtering licensed and other unprotectable elements out of Apple' Macintosh GUI, the court found that only a few isolated parts of Apple's interface were subject to copyright protection. The court also agreed that Apple was entitled to protect its "unique selection and arrangement" of its (largely uncopyrightable) features.[155]

However, the claim that Microsoft and Hewlett-Packard copied the *arrangement* of icons and menu items works at a higher level of abstraction than the claim that they copied the icons themselves. Rather than individual program elements, Apple is now claiming that the overall structure of the GUI has been copied. Because the alleged infringement occurs at a higher level of abstraction, the court held that it is not enough to show that the two interfaces were arranged in similar ways: "[w]hen the range of protectable and unauthorized expression is narrow, the appropriate standard for illicit copying is virtual identity."[156] Other courts have similarly acknowledged that copyright protection for computer programs must be judged on a sliding scale, with the degree of similarity required for infringement varying according to the level of abstraction at which copying is alleged to have occurred.[157]

The filtration of unprotectable elements out of a computer program is only part of the analysis in a copyright infringement case. Comparison of the two programs necessarily requires a detailed inquiry into how much copying occurred, and at what level of abstraction. Where the alleged similarities occurred at a high level of abstraction, at which the copyright owner is entitled to little protection, she must be able to show more striking similarities between the works than if the copying had occurred at a lower level of abstraction.

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153. *See, e.g.*, Sid & Marty Krofft Television Prods., Inc., v. McDonald's Corp., 562 F.2d 1157, 1167 (9th Cir. 1977).

154. 35 F.3d 1435 (9th Cir. 1994).

155. *Id.* at 1446.

156. *Id.*

157. *See, e.g.*, Engineering Dynamics v. Structural Software, Inc., 26 F.3d 1335, 1348 (5th Cir. 1994); 3 NIMMER ON COPYRIGHT, *supra* note 52, § 13.03[B][2][b].

## D. Justifications for Copying

Proof of copying under the abstraction-filtration-comparison test does not end the copyright analysis. There is a final step, in which the court must determine whether the copying was justified under one of several provisions giving rights to users of copyrighted programs. The copyright fair use doctrine has increasingly been interpreted to give accused infringers the right to engage in some copying of computer programs for a socially useful purpose. In particular, most courts to consider the issue have permitted the copying of software to the extent necessary to ensure compatibility or interoperability between computer programs, although the issue is not yet completely settled.[158] Similarly, section 117 of the Copyright Act gives users of computer programs the right to make certain copies and derivative works,[159] although some courts have tended to read section 117 fairly narrowly.[160]

The existence of these "justifications for copying" does not relate directly to the determination of copyrightability or infringement. However, because they affect the circumstances under and frequency with which copyright defendants will be held liable, these doctrines may interact with the determination of copyrightability in a somewhat surprising way. Courts may be more willing to confer copyright protection on programs if that protection does not foreclose copying under all circumstances. Judge Boudin's concurrence in *Lotus v. Borland* is quite explicit in identifying this tradeoff.[161]

Indeed, the tradeoff is a particularly important one in the *Lotus* case. The majority in *Lotus* decided that the menu command hierarchy of the 1-2-3 program was not copyrightable at all. This means that if Borland

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158. Courts and commentators favoring copying to achieve compatibility include Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807, 817-18 (1st Cir. 1995); Atari Games Corp. v. Nintendo of Am., 975 F.2d 832, 843-44 (Fed. Cir. 1992); Sega, Inc. v. Accolade, 977 F.2d 1510, 1527-28 (9th Cir. 1992); Vault v. Quaid, 847 F.2d 255, 270 (5th Cir. 1988); JONATHAN BAND & MASANOBU KATOH, INTERFACES ON TRIAL (1995); Julie Cohen, *Reverse Engineering and the Rise of Electronic Vigilantism: Intellectual Property Implications of "Lock-Out" Technologies*, 68 S. CAL. L. REV. 1091 (1995); Dennis S. Karjala, *Copyright Protection of Computer Documents, Reverse Engineering, and Professor Miller*, 19 U. DAYTON L. REV. 975, 1016-18 (1994); David A. Rice, *Sega and Beyond: A Beacon for Fair Use Analysis . . . At Least as Far as It Goes*, 19 U. DAYTON L. REV. 1131, 1168 (1994).

Some commentators remain opposed to compatibility as a justification for copying, and at least one old court decision rejecting compatibility remains the law of that Circuit. *See* Apple Computer v. Franklin Computer, 714 F.2d 1240, 1253 (3d Cir. 1983); Anthony Clapes, *Confessions of an Amicus Curiae: Technophobia, Law and Creativity in the Digital Arts*, 19 U. DAYTON L. REV. 903 (1994); Arthur Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1029-32 (1993).

159. Aymes v. Bonnelli, 47 F.3d 23 (2d Cir. 1995).

160. *See, e.g.*, MAI v. Peak, 991 F.2d 511, 518-19 (9th Cir. 1993).

161. Lotus Dev. Corp. v. Borland Int'l., 49 F.3d 807, 821 (9th Cir. 1994) (Boudin, J., concurring).

"had simply copied the Lotus menu (using different code[]), contributed nothing of its own, and resold Lotus under the Borland label,"[162] it would still be off the hook under the majority's analysis. By contrast, the alternative suggested by Judge Boudin–that "Borland's use is privileged because . . . it is not seeking to appropriate the advances made by Lotus' menu"[163]–would protect Borland only in situations where it had contributed something of public value, or where it had not appropriated value from Lotus. The result in the actual case would be the same under this "privileged use" rationale, but Lotus would still be able to protect its menu structure against those who merely sought to counterfeit it.

## V. CONCLUSIONS

For some time, judicial and academic debate on software copyright law has focused on selecting the appropriate test for copyrightability of computer programs. Today, this debate has largely been resolved. Since the adoption of the abstraction-filtration-comparison test by the Second Circuit in 1992, most courts to consider the issue have lined up behind this approach. However, this convergence on a legal standard for software copyright law has not produced corresponding agreement among the courts in the outcomes of copyright infringement cases. Rather, the terms of the debate seem to have changed.

In this Article, I suggest a way to apply the abstraction-filtration-comparison test which should help courts make consistent decisions regarding infringement. First, the abstraction test should be used only as an analytic guide, and not as a representation of reality. Viewed as a guide, it is possible to reconcile even cases such as *Lotus v. Borland* with the *Altai* approach to infringement. Second, the filtration analysis must take account of software patents. The ready availability of software patents means that broad copyright protection for the structural and functional elements of computer software is less important today than it was ten years ago. It also means that courts should be careful to respect the idea-expression dichotomy in applying the filtration test. Third, copying is not a unitary phenomenon. In comparing two works, courts should be sensitive to both the extent of the similarity between the works, and the level of abstraction at which the similarity is tested. To account for these factors, courts should adopt a sliding-scale approach to copyright infringement. Finally, a finding of infringement is not necessarily the end of the story. Copyright fair use doctrine provides a number of possible justifications for copying that courts should consider closely.

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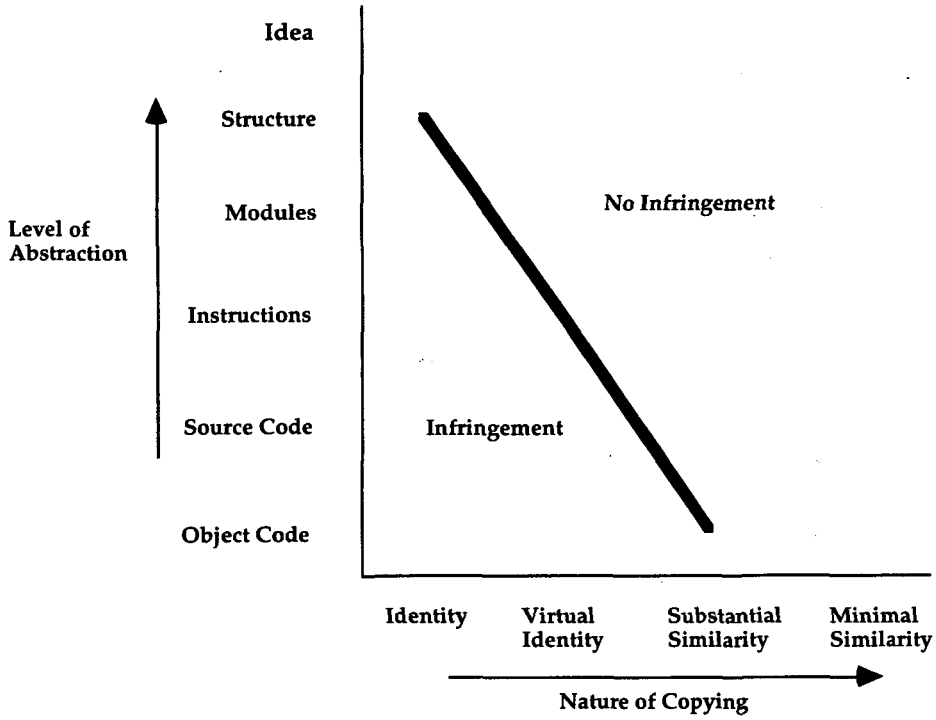
162. *Id.*
163. *Id.*

Application of these principles will help ensure consistent judicial decision making, as well as a copyright doctrine which is both fair and consistent with the rest of intellectual property law.

# APPENDIX

Software Copyrights

Figure 1
*Copying and Infringement*



# ARTICLE

## THE QUESTION CONCERNING PATENT LAW AND PIONEER INVENTIONS

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## I. INTRODUCTION

Legal scholars recognize the importance of philosophical studies to the analysis of our system of patents and other intellectual property regimes.[1] Many of these scholars apply John Locke's theory

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1. *See, e.g.*, Kurt L. Glitzenstein, *A Normative and Positive Analysis of the Scope of the Doctrine of Equivalents*, 7 HARV. J.L. & TECH. 281, 314-22 (1994); Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533, 1535, 1538 (1993); Richard A. Epstein,

of property rights[2] to determine which technological advancements should be eligible for patent protection. Commentators have turned less enthusiastically to Georg Wilhelm Friedrich Hegel, perhaps the most significant philosopher to acknowledge intellectual property laws explicitly in his works.[3] They have ignored the works of Aristotle, Karl Marx, and Martin Heidegger, philosophers who contemplated the nature of technology itself.[4]

The patent system is a regime of technological evaluation.[5] Thus, technology as a philosophical concern aids appreciation of the nature and function of patent law. This article undertakes a philosophical analysis with regard to the doctrine of the pioneer invention. Under the common law principle of pioneer inventions,

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International News Service v. Associated Press: *Custom and Law as Sources of Property Rights in News*, 78 VA. L. REV. 85 (1992); Alfred C. Yen, *Restoring the Natural Law: Copyright as Labor and Possession*, 51 OHIO ST. L.J. 517, 517, 522-24 (1990); Linda J. Lacey, *Of Bread and Roses and Copyright*, 1989 DUKE L.J. 1532, 1536-37, 1568-84; Roberta Rosenthal Kwall, *Governmental Use of Copyrighted Property: The Sovereign's Prerogative*, 67 TEX. L. REV. 685, 689-92 (1989); Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287 (1988).

2. JOHN LOCKE, THE SECOND TREATISE OF GOVERNMENT (Thomas P. Peardon ed., 1952).

3. Hegel notes that:

> The purely negative, though the primary, means of advancing the sciences and arts is to guarantee scientists and artists against theft and to enable them to benefit from the protection of their property, just as it was the primary and most important means of advancing trade and industry to guarantee it against highway robbery.

GEORG HEGEL, PHILOSOPHY OF RIGHT 55 (1821) (T.M. Knox trans. 1952). Others acknowledging intellectual property include JOHN STUART MILL, PRINCIPLES OF POLITICAL ECONOMY Vol. I 145-46 (1909), and JEREMY BENTHAM, *Manual of Political Economy, in* JEREMY BENTHAM'S ECONOMIC WRITINGS 219, 260-65 (W. Stark ed., 1952).

4. This Article will not directly address the interesting questions relating to the meaning of such terms as "technology" and "invention." *See* Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 805, 806-11 (1988); DON IHDE, EXISTENTIAL TECHNICS 9 (1983); ARNOLD PACEY, THE CULTURE OF TECHNOLOGY 4-7 (1983); James K. Feibleman, *Pure Science, Applied Science and Technology: An Attempt at Definitions, in* PHILOSOPHY AND TECHNOLOGY: READINGS IN THE PHILOSOPHICAL PROBLEMS OF TECHNOLOGY 33 (Carl Mitcham & Robert Mackey eds. ,1982) [hereinafter PHILOSOPHY AND TECHNOLOGY]. With respect to "technology," it will generally use the word as the patent law does, referring to the physical machines and structures themselves, rather than in the more comprehensive, humanistic sense of the entire system of artifacts, human knowledge and social organization, often labeled "technique." The distinction between these uses of the term, with all of its ramifications, undergirds much of the analysis to follow; therefore, where necessary, this Article will point to the different senses of the term it employs.

5. *See infra* notes 31-42 and accompanying text.

courts may grant a broader scope of protection to patents covering revolutionary technological advances than to those covering more modest achievements.[6] Courts construe pioneer patent claims more broadly than others, thus allowing the claims to encompass a broader range of so-called "equivalents" during an infringement determination.[7]

The pioneer invention doctrine provides a good illustration of the importance of the philosophy of technology for two reasons. First, laypersons and technologists share the view that pioneer inventions are crucial to the sort of technological advance[8] that the patent system is designed to encourage.[9] They are the inventions with which we are most familiar, and those we care most about. Innumerable popular histories of technological progress focus on pioneer inventors and the revolutionary advances they are said to have brought about.[10]

Second, pioneer inventions are of profound interest to scholars of the patent law. Although the studies of these scholars share an economic orientation, their conclusions have been inconsistent. Professor A. Samuel Oddi has proposed the grant of a "revolutionary patent" for pioneer inventions.[11] To obtain a revolutionary patent, an applicant would have to demonstrate that the claimed invention represented an extraordinary technical advance, changed existing production or consumption patterns, and required an extensive development effort. Under this scheme, revolutionary patents would obtain an extended duration and scope of protection in comparison with ordinary utility patents.

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6. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608 (1950).

7. *See infra* notes 48-55 and accompanying text.

8. GEORGE BASALLA, THE EVOLUTION OF TECHNOLOGY 26 (1988).

9. The Constitution empowers Congress to enact legislation "[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.

10. *See, e.g.*, F. CLIFTON BERRY, JR., INVENTING THE FUTURE (1993); Donald J. Perralla, *The Influence of the Patent System on the U.S. Economy*, 49 J. PAT. OFF. SOC'Y 52, 52-53 (1967); T.K. DERRY & TREVOR I. WILLIAMS, A SHORT HISTORY OF TECHNOLOGY (1960).

11. Samuel Oddi, *Beyond Obviousness: Invention Protection in the Twenty-First Century*, 38 AM. L. REV. 1097, 1128-37 (1989). *See also* Friedrich-Karl Beier, *Future Problems of Patent Law*, 3 INT'L REV. INDUS. PROP. & COPYRIGHT L. 423, 441-45 (1972) ("Should we not accord preferential treatment to inventions that are of special significance for society, examine them more quickly, publish them earlier, and protect them more broadly?").

In contrast, Professors Robert Merges and Richard Nelson argued that the patent law should, in appropriate instances, favor improvement inventions over pioneer inventions.[12] Such a regime would selectively curtail protection for pioneer patents so that other inventors would be able to develop noninfringing refinements more easily. To achieve this end, courts would employ the reverse doctrine of equivalents[13] and other interpretive tools to maximize the incentives to develop incremental improvements on existing pioneer patents.

This Article does not attempt to choose between these competing views. It appears that further empirical evidence will be required before the economic analysis of pioneer patent law can offer meaningful insights.[14] Instead, this Article will focus on the courts' rationales for the protection of pioneer inventions, and consider how they fare in light of historical experience and philosophical thought.

Part II of this Article describes the courts' current view of technology. It begins by detailing the patent acquisition process, patent infringement suits, and the role of the pioneer invention doctrine. It then discusses the origins of the pioneer invention doctrine in early American cases, its development by subsequent courts, and its current application by the Court of Appeals for the Federal Circuit.[15] The Article then evaluates two rationales offered for the pioneer invention doctrine: judicial recognition of the difficulty in drafting claims that fairly define the invention, and a reward of stronger protection to those inventors who have disclosed such

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12. Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 843-44 (1990).

13. Under the reverse doctrine of equivalents, an accused product which falls within the literal terms of a patent claim may nonetheless escape infringement if it is "so far changed in principle . . . that it performs the same or a similar function in a substantially different way." Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605 (1950).

14. *Cf.* George L. Priest, *What Economists Can Tell Lawyers About Intellectual Property, in* 8 RESEARCH IN LAW AND ECONOMICS: THE ECONOMICS OF PATENTS AND COPYRIGHTS 19, 19-20 (John Palmer & Richard O. Zerbe, Jr. eds., 1986) ("The ratio of empirical demonstration to assumption in this literature [applying economic analysis to the domain of intellectual property] must be very close to zero. . . . I do not believe that it is unfair to say that the . . . literature of which I am aware [has] consisted of little more than assumptions. As a consequence, this literature has taught us almost nothing, nor has it guided research or thinking so that an approach with a firmer empirical base could be developed.").

15. The Court of Appeals for the Federal Circuit, created by the Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, § 101, 96 Stat. 25 (codified in various sections of 28 U.S.C.), possesses exclusive jurisdiction over appeals in patent infringement cases.

important advances. This Article acknowledges that claim drafting is a difficult matter, but contends that in many instances, inventions presenting only a modest advance in a crowded technological field also pose drafting problems of extraordinary intricacy. The Article then considers the second justification: incentives and rewards for the disclosure of revolutionary technological advances. By distinguishing pioneer inventions solely by the extent to which they advance the technological arts, without reference to the place these inventions have assumed in society, patent law is assuming one of two alternative technological values. The first is that technology is a neutral force, with no values beyond the use to which it is put. Therefore, inventions are unworthy of evaluation on any dimension other than the technical. Alternately, the patent law's award of negative property rights may be considered as too meager a means of influencing the development of technology. This Article offers a third possibility to explain current patent policy, technological resignation. Such a view holds that, although the patent system indeed has an impact upon the progress of individual inventions, the advance of technology is an inevitable societal force in which the scheme of patents can play only a marginal role. Part II concludes with an analysis of these three views of technology, and argues that they derive from the philosophy of Aristotle and Marx.

Part III presents an alternate conception of technology that is more in line with both historical experience and with modern philosophical thought. The writings of German existentialist philosopher Martin Heidegger are introduced as a more appropriate conceptual basis for understanding the role of technology in society. Several examples are offered, including the Snowmobile Revolution of the late 1960's in northern Finland, the Opium War between Great Britain and China in the nineteenth century, and the recent United States experience with the Supersonic Transport, to question the assumption behind pioneer invention doctrine that technology is a neutral and inevitable social force. A review of the literature surrounding these experiences indicates that the patent law has not taken proper heed of the work of technological historians and anthropologists, who would vigorously contest patent law's implied perspective that technological change is inevitable and devoid of values. The Article closes in Part IV with brief suggestions of how future scholarship might employ philosophical and historical insights in order to evaluate the patent system, and for how the purely technical criteria for patentability and infringement could be

expanded to include a concern for the societal impact of the patented product.

## II. PATENT LAW: AN INSTRUMENTAL VIEW OF TECHNOLOGY

As patent law, and in particular the pioneer invention doctrine, have emerged, the courts have been virtually silent on the philosophical underpinnings of the value placed on an invention as an improvement over prior technology. This section argues that the philosophies of Aristotle, Hegel, and Karl Marx have influenced American patent law's view of technological change as inevitable and patent law's lack of inquiry into the social benefits of an invention.

### A. Patent Grants and Patent Infringement

Courts and commentators frequently analogize the grant of a patent to that of a contract formed between an inventor and the public.[16] Through ownership of a patent, an inventor obtains the right to exclude others from making, using or selling the patented invention.[17] In exchange, inventors must disclose their discovery to the public with sufficient specificity to allow others knowledgeable in the relevant field to employ the invention.[18] To extend the contract analogy, one could say that the Patent and Trademark Office (PTO) acts as the agent of the public during formation of the contract. The patent acquisition process at the PTO provides an initial, but not incontestable, assurance that only those inventions which fulfill the statutory prerequisites receive a patent grant.[19]

An individual seeking patent protection for an invention must first prepare an application for submission to the PTO. The application primarily consists of the invention's "specification."[20] The specification is an often lengthy description of the technical problem the inventor faced and the invention produced to solve that problem. The specification includes the invention's ingredients and a description of how the ingredients work together.[21] The description

16. *See, e.g.*, Fried. Krupp Aktien-Gesellschaft v. Midvale Steel Co., 191 F. 588, 594 (3d Cir. 1911); ERNEST BAINBRIDGE LIPSCOMB III, WALKER ON PATENTS § 1:6 at 38-41 (3d ed. 1984, Vol. III).

17. 35 U.S.C. § 154 (1988).

18. *See, e.g.*, 35 U.S.C. §§ 111-112 (1988).

19. *See* ROBERT PATRICK MERGES, PATENT LAW AND POLICY 30-33 (1992).

20. 35 U.S.C. §§ 111-112 (1988).

21. 35 U.S.C. § 112 (1988).

must be so complete as to enable practitioners in the technical field to use the invention.[22] It also must include what the inventor believes to be the invention's "best mode," the superior method of accomplishing the invention.[23]

The specification serves more as an introduction and foundation than as a source of legal rights. The patent statute reserves that role for the claims, the precise delineations of the invention placed at the close of the specification.[24] The claims are the primary source of the bundle of property rights associated with a patent.[25]

Claims consist of three primary parts.[26] The first, the preamble, is an introductory statement defining the invention in a general way.[27] Next is the transition, a short phrase, usually "comprising" or "consisting."[28] The body, listing all the elements of the invention and how they interact, concludes the claim.[29] The following claim, describing an artificial heart, illustrates this sequence:

> A blood pumping device to replace or temporarily assist the natural heart, said device comprising:
>
> a) a blood pumping chamber of flexible wall construction, and having separate blood inlet and outlet means; and
>
> b) an inflatable blood displacement member of elastic wall construction located within said pumping chamber and operable upon periodic inflation to forcibly eject blood from said pumping chamber through said outlet means, an inflatable valve head for periodically blocking said inlet means, said valve head being affixed to said displacement member and operable as a valving means, said valve head including means for operating said valve head separately from said inflation of said inflatable blood

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22. 35 U.S.C. § 112 (1988).

23. *Id.*

24. *Id.*

25. *See, e.g.*, Envtl. Designs Ltd. v. Union Oil Co. of Cal., 713 F.2d 693, 699 (Fed. Cir. 1985) (the claims, not the specification, measure the invention). Case law establishes, however, that claims must be read in light of the specification, but limitations in the specification are not to be read into the claims. *E.g.*, Sjolund v. Musland, 847 F.2d 1573, 1581-82 (Fed. Cir. 1988). Further, if the claim has been drafted in functional form, the sixth paragraph of 35 U.S.C. § 112 requires that "such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereto." *See In re* Donaldson, 16 F.3d 1189, 1193 (Fed. Cir. 1994).

26. ROBERT C. FABER, LANDIS ON MECHANICS OF PATENT CLAIM DRAFTING §§ 6-9 (3d ed. 1990).

27. *Id.*

28. *Id.*

29. *Id.*

> displacement member to thereby achieve optimum pumping efficiency of said blood pumping device.[30]

Following submission of the application to the PTO, agency officials (titled examiners) determine whether the claimed invention merits patent protection.[31] The Patent Act of 1952 limits patent protection by an invention's subject matter, utility, novelty and nonobviousness.[32] The invention must consist of a process, machine, manufacture, or composition of matter; excluded are laws of nature or purely mathematical algorithms.[33] The invention must also meet a minimum standard of utility (i.e. operability toward some useful purpose).[34] In this regard, the patent law mandates only that the claims set forth a nonfrivolous invention, not that they provide a technology that is commercially viable or superior to prior advancements.[35] The third requirement, novelty, primarily denies patent protection to inventions already known to others, thereby preventing the withdrawal of an invention from the public domain.[36]

The requirement of nonobviousness is typically the most onerous.[37] The patent statute denies protection to those inventions where "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."[38] An inquiry into nonobviousness primarily entails a comparison of the claimed invention to existing patents, publications and other sources of apposite prior art.[39] Other considerations, such as the sophistication of practitioners in the technical field, the invention's commercial success, or the failure of others to develop the patented invention in the face of an industry need, are also apposite.[40]

PTO examiners reject most patent applications at least once. Any patents that are granted are the product of a dialogue, or so-called

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30. U.S. Patent No. 3,641,591 (Feb. 15, 1972).
31. 37 C.F.R. §§ 1.101-1.109 (1994).
32. *See, e.g.*, 35 U.S.C. §§ 101-103 (1988).
33. *See* 35 U.S.C. § 101 (1988); Diamond v. Diehr, 450 U.S. 175 (1981); Parker v. Flook, 437 U.S. 584, 588-92 (1978); Dann v. Johnson, 425 U.S. 219 (1976); Gottschalk v. Benson, 409 U.S. 63, 67-68 (1972).
34. *See* 35 U.S.C. § 101 (1988).
35. 35 U.S.C. § 101 (1988); *See also* DONALD S. CHISUM, PATENTS § 4.01 (1994).
36. *See* 35 U.S.C. § 102 (1988); *In re* Wyer 665 F.2d 221, 226 (C.C.P.A. 1981).
37. *See, e.g.*, MacLaren v. B-I-W Group, Inc., 535 F.2d 1367, 1376 (2nd Cir. 1976).
38. 35 U.S.C. § 103 (1988).
39. *E.g.*, Graham v. John Deere Co., 383 U.S. 1, 17 (1966).
40. *Id.*; *see generally* Merges, *supra* note 4.

patent prosecution, between applicant and examiner.[41] The examiner may take a different view of the prior art than the applicant, often reading prior art references more broadly than the applicant. Research may also reveal similar prior inventions that the applicant did not discover, making the applicant's submitted claim language anticipated or obvious. An applicant responds to examiner rejections by amending claims or submitting evidence that suggests the invention merits patent protection. A patent issues when the examiner is satisfied that the invention has met the statutory standards.[42]

Once the PTO issues a patent, the patentee obtains the right to exclude others from making, using or selling the patented invention in the United States.[43] Those who do so without the authority of the patentee commit patent infringement.[44] Because the exclusive rights granted by a patent are measured by the scope of the language of the patent claims, claim interpretation looms extraordinarily large in infringement actions. Claims must be read and interpreted[45] both by competitors seeking to avoid infringement and by courts ultimately resolving the issue. As with texts in other areas of the law, the language of claims is not determinative.

A patent can be infringed literally or nonliterally. Literal infringement occurs only when an accused device exactly embodies each element of the original patent's claim.[46] In such instances, the claim is said to "read on" the accused device.[47] Because the omission of any claim element from the accused device indicates that no literal infringement occurs, patent owners often attempt to expand the scope of their claims by invoking the doctrine of equivalents. The doctrine grew from courts' efforts to stop the piracy of an invention by competitors who would copy the invention with minor modifications

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41. DONALD S. CHISUM & MICHAEL A. JACOBS, UNDERSTANDING INTELLECTUAL PROPERTY LAW § 2D[1] (1992).

42. 35 U.S.C. § 101 (1988).

43. 35 U.S.C. § 154 (1988).

44. 35 U.S.C. § 271(a) (1988). *See* Carbice Corp. v. Am. Patents Dev. Corp., 283 U.S. 27, 33 (1931).

45. *See* Autogiro Co. of Am. v. United States, 384 F.2d 391, 396-97 (Ct. Cl. 1967).

46. *See, e.g.*, Key Mfg. Group, Inc. v. Microdot, Inc., 925 F.2d 1444 (Fed. Cir. 1991); Hi-Life Prods. Inc. v. Am. Nat'l Water-Mattress Corp., 842 F.2d 323, 325, (Fed. Cir. 1988); Builders Concrete, Inc. v. Bremerton Concrete Prods. Co., 757 F.2d 255 (Fed. Cir. 1985); Lemelson v. United States, 752 F.2d 1538 (Fed. Cir. 1985).

47. *See, e.g.*, Morton International v. Cardinal Chem. Co., 5 F.3d 1464, 1468 (Fed. Cir. 1993); Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559, 1570 (Fed. Cir. 1992); Lemelson v. General Mills, Inc., 968 F.2d 1202, 1206 (Fed. Cir. 1992).

solely to avoid infringement.[48] Under the doctrine, an accused device that "performs substantially the same function in substantially the same way to obtain the same result"[49] as the patented invention may be found to infringe. Although those individuals making, using or selling such devices would escape liability for literal infringement, such minor, "equivalent" changes do not allow them to avoid infringement under the doctrine of equivalents.

Courts employing the doctrine of equivalents face a policy choice when considering the range of equivalents that should be granted to patent holders.[50] The statutory requirements of novelty and nonobviousness ensure that all patents advance the art; the difficulty lies in determining how broadly these advancements should occupy the field of potentially infringing devices. Policy supports the ability of competitors to study patent claims, exercise legitimate engineering efforts, and produce new, noninfringing products. Such a regime should not be extended, however, to allow copyists to defeat legitimate patent rights through minor, insignificant changes.[51]

In determining the suitable breadth of equivalents, courts will often turn to the specification; courts may look to the patent application or the patent's prosecution history for assistance.[52] Because terms used in the patent application's terse claims must comport with their use in the more lengthy specification, the specification is a valuable aid to interpretation of the claims. Courts have made use of a patent's drawings as well.[53] A third important resource is the patent's prosecution history. Under the doctrine of prosecution history estoppel, a patent holder cannot obtain a construction of a claim previously surrendered during prosecution.[54] If, for example, the patent holder overcomes an examiner's prior art

48. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608 (1950). *See generally* Harold C. Wegner, *Equitable Equivalents: Weighing the Equities to Determine Patent Infringement in Biotechnology and Other Emerging Technologies*, 18 RUTGERS COMPUTER & TECH. L.J. 1 (1992).

49. *E.g.*, Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42 (1929).

50. *See, e.g.*, Pennwalt Corp. v. Durand-Wayland Inc., 833 F.2d 931 (1987) (Newman, J., dissenting); EMERSON STRINGHAM, PATENT CLAIMS DRAFTING § 5051 (1930).

51. *Graver Tank*, 339 U.S. at 607.

52. Autogiro Co. of Am. v. United States, 384 F.2d 391 (Ct. Cl. 1967).

53. *Id.*

54. *See, e.g.*, Jonsson v. Stanley Works, 903 F.2d 812, 817 (Fed. Cir. 1990); Envtl. Instruments, Inc. v. Sutron Corp., 877 F.2d 1561, 1564-66 (Fed. Cir. 1989); Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 870 (Fed. Cir. 1985).

rejection by arguing that the claim does not envelop a given feature, the patent holder is bound by that construction in later proceedings.[55]

## B. The Pioneer Invention Doctrine

Courts have developed one principal tool in determining the scope of equivalents: pioneer status.[56] Once a court determines that the patent describes a pioneering invention, the patent enjoys a broad range of equivalents.[57] Patented inventions that constitute marked, but not pioneering, improvements in the art are entitled to a lesser, although still substantial, range of equivalents.[58] Patented inventions that represent narrow technological improvements receive only a limited range of equivalents.[59]

The Supreme Court set out the requirements for pioneer invention status in *Westinghouse v. Boyden Power Brake Co.*,[60] indicating that the term pioneer, "although used somewhat loosely, is commonly understood to denote a patent covering a function never before performed, a wholly novel device, or one of such novelty and importance as to mark a distinct step in the progress of the art, as distinguished from a mere improvement or perfection of what has gone before."[61] As "most conspicuous examples of such patents" it cited the sewing machine of Elias Howe, Jr.; Samuel Morse's electrical telegraph; and the telephone, invented by Alexander Graham Bell.[62]

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55. *See, e.g.*, Hormone Research Found. v. Genentech, Inc., 904 F.2d 1558 (Fed. Cir. 1990); Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675 (Fed. Cir. 1988); Townsend Eng'g Co. v. Hitec Co., 829 F.2d 1086 (Fed. Cir. 1987).

56. *See generally*, Esther Steinhauser, Note, *Using the Doctrine of Equivalents to Provide Broad Protection for Pioneer Patents: Limited Protection for Improvement Patents*, 12 PACE L. REV. 491 (1992). Under recent scholarly commentary, courts should also consider pioneer status when determining whether to invoke the Doctrine of Equivalents in the first instance. *See* Wegner, *supra* note 48, at 45.

57. *See, e.g.* Steinhauser, *supra* note 56, at 495-500 (describing case law interpretation of scope of patent claims for pioneering inventions).

58. Hughes Aircraft Co. v. United States, 717 F.2d 1351 (Fed. Cir. 1983); Continental Oil Co. v. Cole, 634 F.2d 188, 198 n.7 (5th Cir. 1981); Price v. Lake Sales Supply R.M., Inc., 510 F.2d 388 (10th Cir. 1974); Wine Ry. Appliance Co. v. Baltimore & Ohio Railroad Co., 78 F.2d 312, 317 (4th Cir. 1935).

59. Brill v. Washington Ry. & Electric Co., 215 U.S. 527, 533 (1910); Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U.S. 405, 415 (1908); Kokomo Fence Mach. Co. v. Kitselman, 189 U.S. 8, 24-25 (1903); Kinzewbaw v. Deere & Co., 741 F.2d 383, 389 (Fed. Cir. 1984); Thomas & Betts Corp. v. Litton Sys. Inc., 720 F.2d 1572, 1580 (Fed. Cir. 1983).

60. 170 U.S. 537 (1898).

61. *Id.* at 561-62.

62. *Id.* at 562.

Various tests for pioneer status have been suggested since *Westinghouse*. Yet the Supreme Court's early formulation in *Westinghouse* remains the most articulate; such inventions must achieve a "function never before performed," be a "wholly novel device," or constitute "a distinct step in the progress of the art."[63] Of these factors, the third appears the most helpful. With some difficulty given the technical subject matter, courts can examine previous patents in the art to determine both the measure of technological advance considered sufficient to merit a patent, as well as the general level of skill in the art, and contrast these findings with the technological leap claimed in the alleged pioneer invention.

In contrast, the first two *Westinghouse* factors appear vague and rather unhelpful. The reach of the first *Westinghouse* factor depends largely upon the meaning a court provides to the term "function." "Function" serves as a broad, general term for the usual, required, or expected activity of some object.[64] Because this term can be read so broadly, it provides scant guidance on which inventions should be considered pioneers. At one semantic level, all patentable inventions perform a new function–the actual words of the claims themselves. At another, if the function of the invention is interpreted broadly, almost no invention could claim to achieve a function never before performed. For example, functions as broadly stated as harvesting grain, transporting individuals, or communicating information are well known. The second *Westinghouse* factor suffers from a similar deficiency. The patent statute includes a requirement for novelty, as it did when the Court wrote *Westinghouse*.[65] Unless the Court meant merely to cast every patentable invention as a pioneer, the term "wholly" must be taken as a very significant modifier.

The famous cotton gin of Eli Whitney serves as an example of how difficult it might be to meet the "new function" or "wholly novel" tests. The cotton gin may well be the archetypical pioneer invention in the lay sense of the word. Both jurists[66] and historians[67]

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63. *Id.*
64. *Cf.*, CHISUM & JACOBS, *supra* note 41, at § 2F[2][b][ii].
65. *See supra* note 32 and accompanying text.
66. *See infra* note 149 and accompanying text.
67. *See, e.g.*, ROGER BURLINGAME, MARCH OF THE IRON MEN 170-71 (1938):

> The effect of Whitney's machine was felt in the South for more than a century. It changed the ethnological, economic, political, ethical and industrial face of the country. Without it, it is highly conceivable that the issue of the Civil War would never have appeared, that Lincoln would have remained a small-town lawyer,

have attributed a sequence of historical events to this device which reach deep into the American character. Yet, whether the cotton gin could ascend to pioneer status for the attainment of "a function never before performed" or something "wholly novel" is unclear. The manufacture of cotton cloth may be nearly as old as human civilization itself.[68] Indeed, the same court that heaped extravagant praise upon the achievements of the cotton gin also noted that "[t]he cotton plant has furnished clothing to mankind before the age of Herodotus."[69] As the production of cotton cloth requires the laborious manual separation of often intractable cotton fibers from seed, innovative individuals developed primitive mechanical devices for ginning cotton as early as the twelfth century.[70] American cotton growers used descendants of these devices prior to Whitney's invention. These earlier gins employed two rotating grooved cylinders that separated seed from fiber as cotton bolls passed between them.[71]

Gins prior to Whitney's functioned efficiently only with long staple, or Sea Island, cotton, where the fiber is easily removed from its black seed. In contrast, the fibers of short staple or Inland cotton grown in the southeastern United States cling tightly to its green seed. In inventing a device that would effectively gin short staple cotton, Whitney continued to use a pair of rotating cylinders, but added a slotted metal breastwork which immobilized seeds while they were being stripped of fiber.[72]

In the sense of separating cotton fiber from seed, then, Whitney's invention cannot be said to have performed a heretofore unknown function or to have been wholly novel. Nor can mechanically ginning cotton, or ginning cotton through two cylinders, be claimed as its unique function. Only if one describes its function with more

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> that the deeper South would have labored under the smoke-clouds of factories, that jazz music and dancing and Sewanee folklore would never have invaded the world, that the fine old traditions of aristocrats, colonels, hospitality, manor-houses, spoon bread and juleps would have "gone with the wind" even more palpably than they did in [Ms.] Mitchell's novel.

68. *Id.*

69. Whitney v. Carter, 29 F. Cas. at 1072 (quoting unreported opinion in Whitney v. Fort).

70. *Id.*

71. *See* JEANNETTE MIRSKY & ALLAN NEVINS, THE WORLD OF ELI WHITNEY 66-67 (1952).

72. *Id.*

specificity–readily ginning short staple cotton–would Whitney's invention fulfill either of the first two *Westinghouse* factors.

More recent definitions of pioneer inventions comport with the *Westinghouse* factors, although they tend to be considerably more terse. Courts have considered an invention to be a pioneer when it presents a "broad breakthrough,"[73] "major advance,"[74] or "basic operational concept";[75] or is "broadly new"[76] or "devoid of significant prior art."[77] Pioneer inventions have alternatively been called primary,[78] basic,[79] generic,[80] original,[81] or key[82] inventions. The sole index of pioneer status, then, is the position occupied by the invention in its technological field.[83] Patented inventions that represent great technical accomplishments receive a broader range of equivalents than other, less technically accomplished inventions. Nontechnical factors, such as the invention's impact on society or commercial success, are of at best fleeting concern.[84] Pioneer status is thus a term of art. In some sense, of course, every patentable invention is a technological pioneer in the common meaning of the term due to the

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73. Sun Studs Inc. v. ATA Equip. Leasing Inc., 872 F.2d 978, 987 (Fed. Cir. 1989).

74. Universal Gym Equip. Inc. v. ERWA Exercise Equip. Ltd., 827 F.2d 1542, 1548 (Fed. Cir. 1987).

75. Hughes Aircraft Co. v. United States, 717 F.2d 1351, 1362, (Fed. Cir. 1983).

76. Brothers v. United States, 250 U.S. 88, 89 (1919).

77. Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 805 F.2d 1558, 1572 (Fed. Cir. 1986).

78. Diamond Rubber Co. v. Consolidated Rubber Tire Co., 220 U.S. 428, 435 (1911); Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U.S. 405, 413-14 (1908); Cimiotti Unhairing Co. v. Am. Fur Refining Co., 198 U.S. 399, 414 (1905); Singer Mfg. Co. v. Cramer, 192 U.S. 265, 278 (1904); Kokomo Fence Mach. Co. v. Kitselman, 189 U.S. 8, 10 (1903); Hobbs v. Beach, 180 U.S. 383, 400 (1901); Morley Sewing-Mach. Co. v. Lancaster, 129 U.S. 263, 273 (1889).

79. Wine Ry. Appliance Co. v. Baltimore & Ohio R.R. Co., 78 F.2d 312, 317 (4th Cir. 1935).

80. Hildreth v. Mastoras, 257 U.S. 27, 28 (1921). The use of the term "generic" in this context should not be confused with its contemporary application in claiming practice. *See* CHISUM, *supra* note 35, at § 12.03 [3].

81. Westinghouse v. Boyden Power Brake Co., 170 U.S. 537, 546 (1898).

82. Buehler AG v. Ocrim SpA, 836 F. Supp. 1305, 1311 (N.D. Tex. 1993).

83. E.g., MAC Corp. of Am. v. Williams Patent Crusher & Pulveriser Co., 767 F.2d 882, 884 n.3 (Fed. Cir. 1985) ("'Pioneer' status has to do with the position occupied by the invention in the art to which it pertains, or which it creates . . . .").

84. *See* Alpex Computer Co. v. Nintendo Co., 770 F. Supp. 161, 167 (S.D.N.Y. 1991) (no support shown for "assumption . . . that a determination of pioneer status turns on a showing of commercial success."); Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1532 (Fed. Cir. 1987) ("That an improvement enjoys commercial success and has some industry impact, as many do, cannot compel a finding that an improvement falls within the pioneer category.").

strict prerequisites of the Patent Act.[85] For an invention to be considered a pioneer within the meaning of the pioneer invention doctrine, however, it must meet what amounts to a test of extraordinary nonobviousness.[86]

A review of the history of the pioneer invention doctrine provides interesting insights into its rationale and application. One of the first patent cases to reach the Supreme Court, *Evans v. Eaton*,[87] presents the genesis of the pioneer invention doctrine. This infringement suit involved a patent on a hopper-boy, a shaft-shaped container for cooling, drying and distributing meal as part of the process of flour production.[88] The case turned upon the interpretation of a Patent Act provision which voided patents that described inventions that "had been in use, or had been described in some public work anterior to the supposed discovery of the patentee . . . ."[89] The accused infringer contended that an earlier invention, the Stouffer hopper-boy, rendered the asserted invention unpatentable. Although the patented invention was not identical to Stouffer's hopper-boy–indeed, it offered some improvements over the prior art–the jury accepted the argument and relieved the defendants of infringement liability.[90]

Writing for the Court, Justice Story affirmed the holding of the circuit court that the patent was invalid for presenting an insufficient improvement over an original, primary invention.[91] The Court approved jury instructions providing that a device not identical to the patented invention, but nonetheless "substantially the same in principle," could be unpatentable.[92] Although the Court did not explicitly employ the doctrine of equivalents, it nonetheless endorsed jury instructions remarkably similar to the modern formulation of the doctrine:[93] "if the two machines be substantially the same, and operate in the same manner, to produce the same result, though they

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85. GEORGE L. ROBERTS, PATENTABILITY AND PATENT INTERPRETATION 736 (1927).

86. *But see* Upjohn Corp. v. Riahom Corp., 641 F. Supp. 1209, 1219 (reaching rather odd conclusion that it is not true that "as a matter of law, the pioneer status of a patent helps to establish its validity.").

87. 20 U.S. (7 Wheat.) 356 (1822).

88. An earlier decision by the Court, Evans v. Eaton, 16 U.S. (3 Wheat.) 454, 456-71 (1818), includes the text of the asserted patent.

89. Patent Act of 1793 § 6, Ch. 11, 1 STAT. 318-23 (February 21, 1793).

90. *Evans*, 20 U.S. at 383.

91. *Id.* at 362-363.

92. *Id.* at 370.

93. *See supra* note 49 and accompanying text.

may differ in form, proportions, and utility, they are the same in principle . . . ."[94] While *Eaton* did not specifically name the Stouffer hopper-boy as a pioneer, the Court offered the principle that an original, primary invention could render subsequent narrow improvements unpatentable.[95]

To the extent *Eaton* employed the doctrine of equivalents and the pioneer invention concept, it did so in the context of patent validity. Modern cases, of course, would employ these notions in infringement suits.[96] The use of the pioneer invention concept in infringement suits had occurred at least by the time the Supreme Court decided *Morley Sewing-Machine Co. v. Lancaster*,[97] often cited as its first recognition of the pioneer invention doctrine.[98] The Court noted that

> Where an invention is one of a primary character, and the mechanical functions performed by the machine are, as a whole, entirely new, all subsequent machines which employ substantially the same means to accomplish the same result are infringements, although the subsequent machine may contain improvement in the separate mechanisms which go to make up the machine.[99]

The incorporation of the pioneer invention doctrine into an infringement analysis is unsurprising given the extent to which patentability and infringement determinations resemble one another.[100] Indeed, with respect to an obviousness bar to patentability and literal infringement, the mode of reasoning is identical,[101] supporting the maxim that "that which infringes if later, anticipates if earlier."[102] The recent, surprisingly controversial[103] decision by the Court of Appeals for the Federal Circuit in *Wilson Sporting Goods Co. v. David Geoffrey & Associates*[104] affirms the parallel nature of these

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94. *Evans*, 20 U.S. at 361.

95. *Id.*

96. *See supra* notes 44-49 and accompanying text.

97. 129 U.S. 263 (1889).

98. *E.g.*, CHISUM, *supra* note 35, at § 18.04[2].

99. 129 U.S. at 273.

100. *See* MERGES, *supra* note 19, at 706 (1992).

101. *See supra* notes 44-49 and accompanying text.

102. Peters v. Active Mfg. Co., 129 U.S. 530, 537 (1889). *See also* Miller v. Eagle Mfg. Co., 151 U.S. 186, 203 (1894); Commercial Mfg. Co. v. Fairbank Canning Co., 135 U.S. 176, 194 (1890); Lewmar Marine Inc. v. Barient Inc., 827 F.2d 744, 747-48 (Fed. Cir. 1987). *But see* ROBERT HARMON, PATENTS AND THE FEDERAL CIRCUIT 85 (2d ed. 1991).

103. *See* Parker, *Doctrine of Equivalents Analysis after Wilson Sporting Goods: The Hypothetical Claim Hydra*, 18 AM. INTELL. PROP. L. ASS'N Q.J. 262 (1990).

104. 904 F.2d 677 (Fed. Cir.), *cert. denied*, 498 U.S. 992 (1990).

patent law doctrines. The court provided that, when attempting an infringement analysis under the doctrine of equivalents,

> it may be helpful to conceptualize the limitation on the scope of equivalents by visualizing a *hypothetical* patent claim, sufficient in scope to *literally* cover the accused product. The pertinent question then becomes whether that hypothetical claim could have been allowed by the PTO over the prior art. If not, then it would be improper to permit the patentee to obtain that coverage in an infringement suit under the doctrine of equivalents. If the hypothetical claim could have been allowed, then *prior art* is not a bar to infringement under the doctrine of equivalents.[105]

The *Wilson Sporting Goods* test thus enunciated a standard comparing the accused device with the prior art, in contrast to both tests of patentability which measure the claimed invention against the prior art, and ordinary infringement inquiries which contrast the accused device with the claimed invention.[106] Other Federal Circuit cases have also remarked upon the similarity between obviousness and equivalents determinations,[107] and it should be noted that some European patent systems consider whether a proposed infringing equivalent would have been obvious to a skilled technician.[108] So, just as Stouffer's primary invention in *Eaton* obtained a breadth of equivalents sufficient to render the asserted patent invalid, so too did the *Morley* court impart a reading to the claims of the patented pioneer invention broad enough to capture the accused device. Whether in the context of validity or infringement, under the doctrine of equivalents recognition that the known technologies surrounding pioneer inventions are relatively meager suggests that patent claims

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105. *Id.* at 684.

106. *See* MERGES, *supra* note 19, at 706.

107. *See* Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989) ("equivalents [is] a legal theory that is pertinent to obviousness under Section 103, not anticipation under Section 102"); Lewmar Marine Inc. v. Barient Inc., 827 F.2d 744, 748 (Fed. Cir. 1987) ("if one wished to draw a parallel, [the doctrine of equivalents] is somewhat akin to obviousness"). *But See* Malta v. Schulmerich Carillons, Inc., 952 F.2d 1320 (Fed. Cir. 1991), *cert. denied*, 504 U.S. 974 (1992) ("obviousness is simply non-probative of the three-part test of equivalence").

108. *See, e.g.*, Improver Corp. v. Rymond, [1991] F.S.R. 233 (citing Improver Corp. v. Remington Consumer Prods., [1990] F.S.R. 181 and Catnic Components Ltd. v. Hill & Smith Ltd., [1982] R.P.C. 183); Stephen M. Bodenheimer, Jr. & Dr. John Beton, *Infringement by Equivalents in the United States and Europe: A Comparative Analysis*, 15 EUROPEAN INTELL. PROP. REV. 83, 89 (1993); Comment, 12 INT'L REV. INDUS. PROP. & COPYRIGHT L. 699 (1981).

describing pioneer inventions should be given a broad range of equivalents.[109]

## C. Justifying the Pioneer Invention Doctrine

The courts have offered little justification for the application of pioneer invention doctrine. However, one justification, the Reward-for-Invention rationale, has begun to emerge. This doctrine is rooted in an effort to foster innovation, by giving enhanced rewards to groundbreaking inventions. However, in determining pioneer status, by focusing only on whether an invention makes a significant technological advance in the field, the courts are ignoring social and other nontechnical factors relevant to whether an invention should be considered revolutionary.

Although the pioneer invention doctrine originated in the context of patent validity, courts have since pursued this doctrine with a surprising vigor in the infringement context. The dearth of policy statements accompanying use of the pioneer invention doctrine in the case law betrays an uncertainty as to its contextual origins and its justifications.

Courts have granted pioneer inventions a broad range of equivalents in part due to the view that it is difficult to draft an adequate claim for a pioneering invention. Under this view, courts consider pioneer inventions so difficult to define that the pioneer inventor should be granted some flexibility during infringement determinations. According to one court:

> The doctrine finds its roots in the judicial recognition that drafting the disclosure and claims for a pioneer patent is a difficult task because of the new scientific ground being broken by the unique invention. Thus, in one sense the doctrine of equivalents remedies the anomaly in the law that exists whenever a pioneer patent is not literally infringed by the very subject matter which was spawned by the disclosure of that pioneer patent.[110]

Courts have thus identified claims describing breakthrough inventions as particularly difficult to draft. Compared with drafters'

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109. *See* Texas Instruments Inc. v. United States Int'l Trade Comm'n, 846 F.2d 1369, 1370 (Fed. Cir. 1988) (denying rehearing of 805 F.2d 1558 (Fed. Cir. 1986)) ("The judicially 'liberal' view of both claim interpretation and equivalency accorded a 'pioneer' invention . . . is not a manifestation of a different legal standard based on an abstract legal concept denominated 'pioneer.' Rather the 'liberal' view flows directly from the relative sparseness of prior art in nascent fields of technology . . . .").

110. Moore v. United States, 211 U.S.P.Q. (BNA) 800, 806 (Ct. Cl. 1981).

attempts at claims describing more modest technological advances, courts believe that drafters of pioneer invention claims are less able to capture the significance of the inventor's contribution, and to predict the shape the technology will take in the future.[111]

A review of the art of claim drafting reveals that these concerns are genuine, albeit somewhat misplaced.

### 1. *THE ART OF CLAIM DRAFTING*

When approached by an inventor seeking patent protection, a patent prosecutor is to craft claims broad enough to provide the patent owner with meaningful commercial protection.[112] Drafters therefore attempt to write claims as broadly as the PTO will allow to issue.[113] Well-written claims do not merely describe a product the inventor would consider putting into commercial practice. Ideally, the claims are somewhat abstract, and broadly describe a range of technologies surrounding the narrowly focused commercial embodiment of the invention. Competitors find efforts to design competing technologies that do not fall within the scope of such claims more difficult, and thus avoid literal infringement less easily.[114]

Claim drafting is thus among the more difficult feats of technical writing.[115] It requires considerable analytic, research and writing skills, as well as scientific and technological competence.[116] Claims submitted to the PTO must reduce sophisticated technical concepts to a single sentence, and yet present an accurate description of the invention.[117] Claims must also be written with a keen awareness of the technical field in which the invention lies. Often only a few carefully chosen words of limitation mark a patentable distinction between the claimed invention and prior technical knowledge.

Formalized drafting conventions further limit the linguistic tools available to a patent prosecutor.[118] None of these conventions are found in the patent statute,[119] and many are startlingly arcane, dating

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111. *See also In re* Hogan, 559 F.2d 595, 606 (C.C.P.A. 1977); *In re* Goffe, 542 F.2d 564, 567 (C.C.P.A. 1976); Merges & Nelson, *supra* note 12, at 848.

112. MERGES, *supra* note 19, at 11.

113. *See id.*

114. *Id.* at 11-18.

115. Topliff v. Topliff, 145 U.S. 156, 171 (1892).

116. *See* CHISUM & JACOBS, *supra* note 41, at § 2D[1].

117. FABER, *supra* note 26, at § 4A.

118. *See, e.g.*, MERGES, *supra* note 19, at 12.

119. CHISUM & JACOBS, *supra* note 41, at § 2D[3][d].

back to the earliest days of United States patent claiming practice.[120] Among these conventions are that claims ordinarily cannot employ alternative expressions;[121] may refer only indirectly to intangible elements such as holes, grooves and recesses;[122] and must be presented as a single English sentence.[123] References to illustrations in the specification are also held not to affect the meaning of the claim,[124] and although photographs and models may be submitted in unusual instances,[125] their use does not impact the scope of patent protection.[126]

Further, the choice of format by which a drafter may describe an invention is, for practical purposes, quite limited. Years of PTO interpretation and judicial precedent have resulted in a discrete number of well-known claim formats: apparatus,[127] method,[128] article of manufacture,[129] composition of matter,[130] means-plus-function,[131] product-by-process,[132] Markush,[133] and Jepson.[134] While we need not step back to the reign of the House of Lancaster to trace the origin of these stylized claiming methods,[135] the weight of precedent often appears to be the best justification for their continued use.

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120. Although the first patent statute appeared in 1790, a claiming requirement first appeared in the Patent Act of 1836. *See* MERGES, *supra* note 19, at 7.

121. MANUAL OF PATENT EXAMINING PROCEDURE § 706.03(d) (5th ed., 15th rev., 1993) [hereinafter MPEP]. The MPEP "'is primarily a set of instructions to the examining corps of the Patent Office from the Commissioner.' It governs the details of PTO examination, is made available to the public, and describes procedures on which the public can rely." Patlex Corp. v. Mossinghoff, 771 F.2d 480, 486 (citing *In re* Kaghan, 387 F.2d 398, 401 (C.C.P.A. 1967)). *See also* FABER, *supra* note 26, at § 24; RISDALE ELLIS, PATENT CLAIMS §§ 299-312 (1949).

122. FABER, *supra* note 26, at § 26.

123. MPEP, *supra* note 121 at § 608.01(m); FABER, *supra* note 26, at § 4A.

124. MPEP, *supra* note 121, at § 608.01(m); FABER, *supra* note 26, at § 2.

125. 35 U.S.C. §§ 113, 114 (1988); 37 C.F.R. § 1.91 (1992); MPEP, *supra* note 121, at § 608.02.

126. *Id.*

127. These claims are also called machine claims. FABER, *supra* note 26, at §§ 14-35; ELLIS, *supra* note 121, at §§ 429-39.

128. These claims are also known as process claims. FABER, *supra* note 26, at §§ 36-39; ELLIS, *supra* note 121, at §§ 366-70.

129. FABER, *supra* note 26, at §§ 45-48; ELLIS, *supra* note 121, at §§ 440-46.

130. FABER, *supra* note 26, at §§ 49-59; ELLIS, *supra* note 121, at §§ 478-85.

131. FABER, *supra* note 26, at § 34.

132. MPEP, *supra* note 121, at § 706.03(e); FABER, *supra* note 26, at § 46.

133. MPEP, *supra* note 121 at § 803.02; ELLIS, *supra* note 121, at §§ 243-54.

134. FABER, *supra* note 26, at § 57.

135. *See* O.W. Holmes, *The Path of the Law*, 10 HARV. L. REV. 457, 469 (1897) (source of the famous aphorism that it is "revolting to have no better reason for a rule of law than that so it was laid down in the time of Henry IV.").

A similar phenomenon has occurred with respect to frequently employed technological terms; as these words have been interpreted by the courts and the PTO over time, settled meanings have evolved.[136] Although patentees ostensibly possess the ability to coin their own terms for use in claims,[137] they have scant incentive to stray from established meanings, and often confront interpretive problems in subsequent litigation when they dare to do so.[138] The result of these forces is a rigid and formalized system of patent claiming. This phenomenon is not limited to patent law, of course; terms used in other legal documents, such as insurance contracts and commercial leases, also become entrenched. But stagnation in claim language presents an extreme difficulty in a field designed to develop with advancing technologies.

The rigid, formalistic art of claim drafting erects considerable barriers against the accurate description of technological inventions. Of course, the lack of opportunity to study the art of claim drafting in an educational setting presents additional challenges to the would-be patent prosecutor. While an increasing number of law schools include intellectual property courses in their curricula, only a handful offer would-be patent attorneys the opportunity to draft even a single patent claim. Although patent prosecutors must pass an examination which tests knowledge of PTO procedures, the extent to which this procedure enhances claim drafting skills is dubious. A patent bar review course, typically lasting no more than a week, is the usual

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136. MERGES, *supra* note 19 at 13. *See* Louis B. Applebaum, *The Art of Describing Structures in Patent Drawings Including a Glossary of Mechanical Terms, in* FABER, *supra* note 26, at 475.

137. *See, e.g.*, Hormone Research Found., Inc. v. Genentech, Inc., 904 F.2d 1558, 1563 (Fed. Cir. 1990) ("It is a well-established axiom in patent law that a patentee is free to be his or her own lexicographer . . . .").

138. *See, e.g.*, ZMI Corp. v. Cardiac Resuscitator Corp., 844 F.2d 1576 (Fed. Cir. 1988). Here, the Federal Circuit found error in the district court's interpretation of a claim on an external cardiac pacemaker, overturning a finding of infringement. The claims drafter's use of the term "electrode," a well-known term in the electrical arts, proved to be the undoing of the patent owner here. A limitation of the claim at issue recited "a pair of electrodes having nonmetallic skin-contacting members that provide low current density to reduce stimulation of local sensory nerves and resulting pain." *Id.* at 1578. The district court agreed with the patentee that because electrodes do not ordinarily provide current—this task instead being accomplished by the pacemaker's generators—the claim read on the accused devices. ZMI Corp. v. Cardiac Resuscitator Corp., 2 U.S.P.Q.2d 1985, 1992 (D. Or. 1987). On appeal, however, the Federal Circuit concluded over a dissent that to fall within the language of the claim, the accused device's electrodes must themselves provide electrical current. 844 F.2d at 1580. *But see* MARTIN J. ADELMAN, PATENT LAW PERSPECTIVES § 3.2[2] (1993) (agreeing with Federal Circuit decision).

preparation for the examination,[139] ensuring only a minimal level of drafting competence. Further, although the PTO imposes certain educational requirements upon those sitting for the examination, these relate only to scientific and technological training.[140] Astonishingly, the PTO does not even consider training or experience in technical writing as a prerequisite for qualification as a patent prosecutor.[141]

### 2. *PIONEER INVENTION CLAIMS ARE NOT THE BIGGEST CLAIMS DRAFTING CHALLENGE*

Within this framework, it can be seen that the conventional wisdom underlying the pioneer invention doctrine is subject to question. The stylized art of claim drafting always presents a complex undertaking. But it may be at its most difficult when an invention presents only a narrow advance in a crowded technological art, rather than a revolutionary advance. When a field is rife with prior technological achievements, drafters must often create fine distinctions from what already is patented or lies within the public domain. Such claims typically become extraordinarily lengthy, as drafters must impart a narrow scope to the claimed invention, distinguishing and contrasting it from dozens of other references.[142] These efforts require drafters to resort to every instrument in their tool kits, carving a sometimes precarious technological niche with the narrowest of margins. Indeed, in the event of modest advancements, one must sometimes wonder whether the most worthy accomplishment presented by the patent is the invention it sets forth, or the clever drafting of the claim to somehow fulfill the requirements of the patent statute.

In comparison, pioneer inventions are not always accompanied by such difficulty in drafting claims. Because the field of endeavor in which the pioneer invention sits is sparse, inventors can draft short claims using sweeping language with ample technological scope.[143]

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139. *See* William Y. Hawes, *A Survey of Recent PTO Admitees*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 331, 335, 337 (1993).

140. *See* General Requirements for Admission to the Examination for Registration to Practice in Patent Cases before the U.S. Patent and Trademark Office ("PTO General Requirements Bulletin"); 37 C.F.R. § 10.7 (1993).

141. *Id.*

142. Of course, as a claim increases in length, it provides a diminishing scope of protection, as accused devices must embody every element of the claim in order to be found to infringe. *See supra* notes 46-47 and accompanying text.

143. *See* Merges & Nelson, *supra* note 12, at 848. Where possible, the drafter will supplement these broad claims with more narrowly worded claims. Typically, only

Further, as the patent examiner lacks a significant number of prior inventions to reference as the basis for rejection of the pioneer claims, the application often advances readily through the prosecution process. The decreased dialogue between the applicant and examiner results in a meager prosecution history, and thus a lesser basis for prosecution history estoppel that may limit the scope of the claims in subsequent litigation.[144]

Brief research on recent patents judicially declared to claim pioneer inventions confirms this reasoning. A consideration of the prosecution history, or file wrapper, of these patents indicated that the paucity of prior art was, if anything, the forerunner of a smooth prosecution despite the sweeping claims generally found in these patents.[145] Conversations with patent practitioners confirm this short study. One noted that he would be a more effective drafter of claims describing a pioneer semiconductor device than a simple mechanical kitchen appliance, given the notoriously crowded state of the art. Although this brief research certainly cannot be accorded any sort of empirical validity, it provides some support for the reasoning employed in this article.

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drafters writing claims on substantial technological advancements are able to employ this technique, as existing technological knowledge substantially detracts from the ability of the drafter to vary the scope of the claims. Drafters often form these narrower claims by adding additional words of limitation to the language of earlier claims, creating something of a pyramidal structure to the patent claims. *See* ELLIS, *supra* note 123, at §§ 113-23. This technique allows the patent holder to enjoy both the robust protection of broad claims and the certainty of more tightly drafted claims as well. During subsequent litigation, where the patent owner asserts individual claims rather than the entire patent against an accused infringer, these narrower claims may present a more snug fit with respect to accused infringements, and are also less susceptible to validity challenges.

144. *See supra* notes 54-55 and accompanying text. *But see* Laitram Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 861 (Fed. Cir. 1988) ("It is commonplace for claims to inventions, pioneer and non-pioneer, to be amended during prosecution.").

145. *See, e.g.*, Read Corp. v. Portec, Inc., 748 F. Supp. 1078, 1095 (D. Del. 1990), *aff'd in part and rev'd in part, on other grounds*, 970 F.2d 816 (Fed. Cir. 1992) (U.S. Pat. No. 4,197,194); Loral Corp. v. B.F. Goodrich Co., 14 U.S.P.Q.2d (BNA) 1081, 1087 (S.D. Ohio 1989) (U.S. Patent No. 3,650,357); Insta-Foam Prods., Inc. v. Universal Foam Sys., Inc., 1988 U.S. Dist. LEXIS 17582, *16 (E.D. Wis. August 19, 1988) (U.S. Pat. No. 3,784,110); Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 671 F. Supp. 1369, 1377 (S.D.N.Y. 1987), *aff'd*, 868 F.2d 1251 (Fed. Cir. 1989); Rallston Purina Co. v. Far-Mar-Co, Inc., 586 F. Supp. 1176 (D. Kan. 1984), *aff'd in part and rev'd in part, on other grounds*, 772 F.2d 1570 (Fed. Cir. 1985) (U.S. Pat. No. 3,940,495); Nomadic Structures, Inc. v. Portable Exhibit Factory, Inc., 224 U.S.P.Q. (BNA) 937, 946 (C.D. Cal. 1984) (U.S. Pat. No. 4,290,244).

The difficult and time-consuming process of claim drafting concerns courts that adjudicate infringement suits. As the Federal Circuit recognized, "[w]e are up against what we must realistically consider a growing inability of speakers and writers, lawyers, technicians, and layman, to say what they intend to say with accuracy and clarity."[146] Indeed, given all the difficulties associated with our formal system of claiming, a surprising paucity of literature questions the emphasis our patent system places upon claims, or justifies the access inventors need to attorneys specializing in claim drafting in order to obtain meaningful intellectual property rights, as compared to those seeking copyright or trademark protection. Thus, to justify the pioneer invention doctrine, courts are relying, inappropriately, on the rationale that claims for pioneer inventions are difficult to draft. Rather, it seems that such claims may be relatively easy to draft. If courts are concerned with the difficulty of claim drafting, they should address the problem directly rather than using pioneer status as a poor proxy for claim drafting difficulties. Courts could, for instance, consider the source of the prosecution of an individual patent itself, by examining its file wrapper and eliciting testimony from the inventor, examiner and claims drafter.

### 3. *REWARDING INVENTORS IS A BETTER RATIONALE FOR THE PIONEER INVENTION DOCTRINE*

A second, more intuitive premise for the recognition of pioneer inventions is that the doctrine enhances the award given to revolutionary inventors, and thus heightens incentives for others to generate significant technological advances and disclose them to the public. The patent system offers inventors a single reward: exclusive rights in a technology, as set forth by the claims of a patent.[147] By liberally interpreting claims describing pioneer inventions, courts increase this range of exclusivity. Such a liberal interpretation flows from the belief that in the exchange of technological disclosure for exclusive rights,[148] the public received an extraordinary bargain, for which the pioneer inventor should receive additional compensation.

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146. ZMI Corp. v. Cardiac Resuscitator Corp., 844 F.2d 1576, 1583 (Fed. Cir. 1988) (Nichols, J., dissenting).

147. *See, e.g.*, United States v. General Electric Co., 272 U.S. 476, 489 (1926); *In re* Schoenwald, 964 F.2d 1122, 1124 (Fed. Cir. 1992); Merges, *supra* note 4, at 811 ("The basic requirements for a patent reflect the dual functions of disclosure and reward.").

148. *See supra* notes 16-18 and accompanying text.

Few could doubt the sense of gratitude felt by one jurist towards the cotton gin of Eli Whitney:

> The whole interior of the Southern states was languishing, and its inhabitants emigrating, for want of some objects to engage their attention, and employ their industry, when the invention of this machine at once opened views to them which set the whole country in active motion. From childhood to age, it has presented us a lucrative employment. Individuals who were depressed with poverty, and sunk in idleness, have suddenly risen to wealth and respectability. Our debts have been paid off, our capitals increased, and our lands have trebled in value. We cannot express the weight of obligation which the country owes to this invention; the extent of it cannot now be seen.[149]

Justification of the pioneer invention doctrine, however, does not answer the question of how the patent law distinguishes those favored few inventions from the remainder of the technologies. Identification of precisely which inventions the patent law awards broad property rights provides interesting insights into the nature and functions of the patent system as a whole.

The Seventh Circuit and Supreme Court opinions in *Kokomo Fence Machine Co. v. Kitselman*[150] illustrate two fundamentally different approaches a court could take under this reward-for-invention rationale. Pioneer status could be granted either for inventions that represent major technical breakthroughs, or those that promise or achieve a major impact on society. Kitselman asserted several patents against the Kokomo Company in an infringement suit.[151] The key patent at issue claimed a fence-making machine that could be used in the field at the site where the fence would ultimately stand.[152] Both the patented and accused machines employed twisting gears and spindles to weave a wire mesh.[153] Both machines achieved a mesh by supplying wire, which was wrapped around spools, to the appropriate spindle during the weaving process.[154] But the two devices used different methods to feed wire into the weaving apparatus.[155] Kitselman's patent described spool-carriers that were

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149. Whitney v. Carter, 29 F. Cas. 1070, 1072 (C.C.D. Ga. 1810) (No. 17,583). Despite this passage, Whitney's thwarted efforts to enforce the cotton gin patent are legendary. *See* Wegner, *supra* note 48, at 10.

150. 189 U.S. 8 (1903).

151. *Id.* at 9.

152. *Id.* at 12.

153. *Id.* at 17-18.

154. *Id.* at 23-24.

155. *Id.*

controlled by an adjustable hand lever, connected so as to move identically, and transferred among spindles while stationary.[156] In contrast, the Kokomo machine employed spool-carriers that were controlled by a rotating crank, arranged to move independently, and transferred while rotating.[157] The differences between the two spool-carriers were such that the spool-carrier described in the Kitselman patent would not operate in the Kokomo device without modification.[158]

These disparities indicated that the Kokomo device did not literally infringe the Kitselman patent.[159] A comparison of the Kitselman patent claims with the Kokomo device, however, presented a close case for infringement under the doctrine of equivalents.[160] The suit ultimately turned upon the scope of the equivalents to be accorded these claims.[161] If the court read the claims narrowly, the accused device would not infringe.[162] A more liberal interpretation, however, would ensnare the Kokomo Company's device.[163] The crux of Kitselman's case, then, was whether he could successfully argue that his patent claimed a pioneer invention and thus that his claims deserved a liberal interpretation.[164]

In an unreported decision, the district court held that the Kitselman patent was not a pioneer, and that the Kokomo Company was not an infringer.[165] On appeal, the Court of Appeals for the Seventh Circuit reversed.[166] First, the court presented a detailed analysis of the technological field, including the advances in the art offered by Kitselman.[167] The court concluded that the distinctions between Kitselman's invention and prior technological knowledge

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156. *Id.*

157. *Id.*

158. *Id.* at 24.

159. *Id.*

160. *See id.* ("The circuit court of appeals held that the Kitselman patent was entitled to be treated as embodying primary invention, *and to such liberal construction as brought defendants' machine within it.*" (emphasis added)).

161. *Id.* at 24.

162. *Id.*

163. *Id.*

164. *Id.*

165. Kokomo Fence Mach. Co. v. Kitselman, 108 F. 632, 654 (7th Cir. 1901) (discussing the decision of the district court).

166. *Id.* at 659.

167. *Id.* at 658-659.

were subsidiary and simple.[168] Nonetheless, it called the results achieved by the patented invention revolutionary.[169] Reasoning that "Kitselman disclosed to the world for the first time a practical means of supplying the farmer with a highly useful fence," it accorded the claims at issue a broad construction.[170] A broad reading of the claims was then held to encompass the accused device, which the court characterized as "the direct offspring of Kitselman's thought. . . ."[171] Following the grant of certiorari, the Supreme Court reversed. After a painstaking review of the other inventions in the field, it held that Kitselman's wire-weaving method was known to the art. In the Court's view, Kitselman had merely turned a known fence-making machine on its side and mounted it on a truck.[172] That effort, along with other minor improvements, could not make Kitselman's invention a pioneer. According a narrow construction to the claims of the Kitselman patent, the Court held that they did not read upon the accused device.[173]

The series of opinions in *Kokomo Fence* demonstrates that a determination of pioneer status can be of crucial importance in infringement determinations. Of equal interest, however, is the distinction between the approaches taken by the Seventh Circuit and the Supreme Court in the *Kokomo Fence* opinions. The circuit court emphasized the unique accomplishment of Kitselman's invention–the production of a workable fence in the field–and reasoned that often subtle changes to existing technologies may produce inventions with revolutionary effects.[174] The Supreme Court instead considered only the extent of technological advance of Kitselman's invention over the prior art. Contemporary cases have maintained an approach similar

168. *Id.* at 659.

169. *Id.*

170. *Id.*

171. *Id.* at 94.

172. Kokomo Fence Mach. Co. v. Kitselman, 189 U.S. 8, 13 (1903).

173. *Id.* at 24.

174. *See also* Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U.S. 45, 63 (1923) ("Indeed, when one notes the crude working of machines of famous pioneer inventions and discoveries, and compares them with the modern machines and processes exemplifying the principle of pioneer discovery, one hesitates in the division of credit between the original inventor and the improvers . . . ."); HENRY PETROSKI, THE EVOLUTION OF USEFUL THINGS (1992); BASALLA, *supra* note 7, at 24-25 (describing the continuous nature of technological development); Harold S. Meyer, *Utility Requirement in the Statute*, 49 J. PAT. OFF. SOC'Y 533, 540 (1967) ("Every student of invention knows that the truly revolutionary inventions of greatest social importance first make their appearance in crude form, of little or no immediate value.").

to the Supreme Courts when deciding whether an invention should be awarded with pioneer status.[175]

In the context of the pioneer invention doctrine, courts honor technological advance above all else.[176] In implementing the doctrine, courts follow the Supreme Court's lead in *Kokomo Fence* and solely consider the place of the claimed invention in relation to prior technical knowledge. Those inventions that broadly advance the art receive broad protection. Other considerations regarding the worth of a particular development–such as the invention's affects on society–are irrelevant. The most striking feature of the pioneer invention doctrine is that by granting a broad scope of protection to only the most technically clever artifices, a court blinds itself to the social consequences of the technologies placed before it.[177] Thus, for example, a patented medical device with tremendous life-saving properties, which was nonetheless judged a marginal technological advance, would receive a narrow range of equivalents. In contrast, the pioneer invention doctrine would grant a broad reading of the claims to, say, an extraordinarily sophisticated device which quickly manufactures inexpensive handguns. Although this approach may appear unusual, not only the pioneer invention doctrine, but also the entire structure of the patent system reflects a similar design: the chief bar to patentability, the requirement of nonobviousness, is primarily a measure of technological accomplishment.[178] While secondary considerations supplement the nonobviousness test, they are commercial in orientation, reflecting marketplace success rather than social benefit.[179]

A review of early American case law indicates that the patent law has not always had such a narrow focus on technological advance to the exclusion of considerations of social benefit. In the patent law's formative years, courts considered the social impact of technology when determining the invention's utility.[180] The most famous formulation of the patent statute's utility requirement belongs to

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175. 189 U.S. at 24.

176. *See supra* notes 56-65 and accompanying text.

177. One is reminded of the amusing lyrics:

When the rockets go up who cares where they come down?

"That's not my department," says Wernher Von Braun.

TOM LEHRER, THAT WAS THE YEAR THAT WAS.

178. *See supra* notes 37-39 and accompanying text.

179. *See supra* note 40 and accompanying text.

180. *See generally* Meyer, *supra* note 176, at 533; Note, *The Utility Requirement in the Patent Law*, 53 GEO. L.J. 153 (1964).

Justice Story, a prominent figure in the early development of the patent law[181] who remains of considerable interest to students of patent law.[182] Story noted that an invention would be considered statutorily "useful" if it could be used beneficially in society, but not if it were frivolous, insignificant, or detrimental to the morals, health, or good order of society.[183] Inventions designed, for example, "to poison people, or to promote debauchery, or to facilitate private assassination" would therefore be ineligible for patent protection.[184] As the patent law matured, however, the utility requirement became increasingly diluted. Subsequent case law concerning utility primarily considered whether gambling devices or inventions designed for fraudulent purposes could receive patent protection.[185] Today, the requirement that an invention be "useful" essentially presents no bar to patentability for mechanical patents. So long as an invention is nonfrivolous and presents more than a mere curiosity, the courts and PTO consider the utility requirement satisfied.[186]

In the meantime, few have questioned whether patent grants for inventions as lethal as Gatling's machine gun,[187] as environmentally

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181. *See* CHISUM, *supra* note 35, at v; Wegner, *supra* note 48, at n.29.

182. *E.g.*, Jordan P. Karp, Note, *Experimental Use as Patent Infringement: The Impropriety of a Broad Exception*, 100 YALE L.J. 2169 (1991); Rebecca S. Eisenberg, *Proprietary Rights and the Norms of Science in Biotechnology Research*, 97 YALE L.J. 177 (1987).

183. Manson v. Brenner, 383 U.S. 519, 533 (citing Story, Note on the Patent Laws, 3 Wheat. App. 13, 24). Also, see Justice Story's comments in the early case of Lowell v. Lewis, 15 F. Cas. 1018, 1019 (No. 8568) (C.C.D. Mass. 1817), that an invention would not be considered statutorily "useful" if it were "injurious to the well-being, good policy, or sound morals of society."

184. *Id.*

185. *See* CHISUM, *supra* note 35, at § 4.03.

186. *See* CHISUM, *supra* note 35, at § 4.01[1] (quoting W. ROBINSON, TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS 463 (1890)). The utility requirement sometimes presents difficulties for inventors of new chemical compounds who have yet to realize a practical application for those compounds. *See* David A. Anderson & Edward E. Dyson, Note, *Some Special Problems with the Utility Requirement in Chemical Patents*, 35 GEO. WASH. L. REV. 809 (1967). Additionally, where the claimed invention is a drug or therapeutic, the applicant must demonstrate that acceptable test procedures establish some medical effectiveness. *See, e.g., In re* Ferens, 417 F.2d 1072, 1074-75 (C.C.P.A. 1969) (therapeutic cure for male pattern baldness); *In re* Irons, 340 F.2d 974, 977-78 (C.C.P.A. 1965) (new compound claimed to posses an anti-arthritic utility). For most other sorts of inventions, however, the utility requirement primarily acts to prohibit the grant of a patent on applications describing inventions as valueless as a perpetual motion machine. *See, e.g.*, Puharich v. Brenner, 415 F.2d 979, 981-82 (D.C. Cir. 1969) (device for augmenting powers of extra sensory perception).

187. U.S. Patent No. 36,836 (Nov. 4, 1862).

unsound as polystyrene-foam clamshell hamburger packaging,[188] or as rife with deleterious health consequences as a cigarette-making device[189] were beneficial to society or in keeping with sound patent policy. A fleeting trace of these notions is perhaps left in the Atomic Energy Act, which provides that "[n]o patent shall hereafter be granted for any invention or discovery which is useful solely in the utilization of special nuclear material or atomic energy in an atomic weapon."[190] Beyond this, however, neither the pioneer invention doctrine nor the patent law as a whole pays even a backward glance to the social consequences of the technologies it awards with exclusive rights.

## D. The Underlying View of Technology

The pervasiveness of the dismissal of nontechnical factors in determining whether an invention is revolutionary calls into question the core values of the patent law. Paramount among these values is the traditional conception of technology as a neutral tool. As expressed in everyday slogans such as "guns don't kill people–people kill people," individuals see technology not as an end unto itself, but as a means that empowers people to achieve their own ends. If technology represents something "essentially amoral, a thing apart from values, an instrument which can be used for good or ill,"[191] patent law need not evaluate inventions at any level beyond the technological.

Alternatively, patent law may recognize that rather than being a mere neutral means, technology often serves as a transformative end unto itself.[192] Few could doubt, for example, the tremendous impact of the automobile on modern American life. The automobile is the

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188. U.S. Patent No. 4,132,344 (Jan. 2, 1979). *See* PETROSKI, *supra* note 181, at 223-25.

189. *E.g.*, U.S. Patent No. 5,012,823 (May 7, 1991).

190. Atomic Energy Act of 1954, § 152 (codified at 42 U.S.C. § 2181a).

191. ROBERT A. BUCHANAN, TECHNOLOGY AND SOCIAL PROGRESS 163 (1965). *Accord* WADE SIKORSKI, MODERNITY & TECHNOLOGY: HARNESSING THE EARTH TO THE SLAVERY OF MAN 19 (1993); Joseph C. Pitt, *The Autonomy of Technology, in* TECHNOLOGY AND RESPONSIBILITY 99, 113 (Paul T. Durbin ed., 1987) [hereinafter TECHNOLOGY & RESPONSIBILITY].

192. *See* Laurence H. Tribe, *Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality*, 46 S. CAL. L. REV. 617, 642 (1972) ("More persuasive than the realm of technologies pursued as ends is that of technologies which, although pursued largely as means, have the effect of significantly altering the ends—and indeed the basic character—of the individuals and communities that choose them.").

ultimate product of an immense industry, the motivation for vast civil engineering projects, the cause of demographic shifts, a source of tension among international trading partners, and a liberalizing influence on sexual mores. Recognition of the automobile as a distinct, neutral, nonhuman activity is, for many technological thinkers, an unrealistic proposition.[193]

We may decide that, although technology is not a neutral tool, patent law should nevertheless view it as such. Under this view, the grant of patents to individual inventions, and the award of pioneer status to the most technologically accomplished, is held to benefit society in a more ecumenical sense: the patent law seeks to advance the whole of human knowledge,[194] rather than act as some sort of technological gatekeeper.[195] Cultural, economic, political and other forces then select those patented inventions best fit to be commercialized and disseminated within the social fabric.[196]

In so doing, the patent law would, to some extent, follow the tradition of copyright law, which refuses to judge the artistic merits of the works it considers.[197] But even recognizing that the patent law has loftier aspirations, to some degree judging the technical skill of patent applicants, many might consider it a poor instrument for discriminating among inventions. As a property right, a patent ultimately grants its owner only the right to exclude others from making, using or selling an invention, rather than the positive right to employ the invention.[198]

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193. *See* Webster F. Hood, *The Aristotlean Versus the Heideggerian Approach to the Problem of Technology*, *in* PHILOSOPHY AND TECHNOLOGY, *supra* note 4, at 350.

194. *See* LIPSCOMB, *supra* note 16, § 1:6 at 39.

195. The approach of the patent law may even contain a constitutional dimension. The Constitution empowers Congress to enact legislation "[t]o promote the Progress of Science and useful Arts," U.S. CONST. art. I, § 8, cl. 8, rather than, say, "to promote social welfare through the Progress of Science and useful Arts." As suggested in The Federalist, technological advance presumably leads to social benefit automatically:

> The utility of this [patent and copyright] power will scarcely be questioned. The copy right of authors has been solemnly adjudged in Great Britain to be a right at common law. The right to useful inventions seems with equal reason to belong to the inventors. The public good fully coincides in both cases, with the claims of individuals.

THE FEDERALIST No. 43 (James Madison) (Garry Wills ed., 1982).

196. *See* CHISUM, *supra* note 35, at § 18.04[2][c].

197. *See* Bleistein v. Donaldson Lithographing Co., 188 U.S. 239, 251 (1903).

198. *See supra* notes 43-44 and accompanying text. *See also* Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 572 F.2d 1152, 1158 n.5 (6th Cir. 1979); ROGER SHERMAN HOAR, PATENTS 5 (1926).

Taken to its logical limits, though, such a view raises questions about why our society suffers "the embarrassment of an exclusive patent" in the first instance.[199] If patent law has such scant impact on the progress of individual inventions, then we may be well advised to abandon it, particularly in light of repeated concessions that whether the patent system helps or hinders the United States economy is unknown on an empirical level.[200] As advocates of the patent system note, however, those technologies blessed with the imprimatur of the PTO are far more likely to make their way to the market than those that are not. For those without the resources to develop and market their own invention, the possession of a patent is crucial to attracting private investment or government grants.[201] Similarly, those entities with sufficient resources to develop a technology—typically large corporations—are also far more likely to do so if patent protection is available.[202] The capacity of the patent system to promote some inventions over others cannot be denied.

Patent law's refusal to question whether technology has a moral component may represent an even more fundamental passivity. Under this stance, the pioneer invention doctrine does not look beyond technology because it essentially recognizes that any other inquiry into the worth of a particular invention would be futile. This viewpoint suggests a belief in technological inevitability, which comports with the views of contemporary technological dystopians, including Jacques Ellul, Lewis Mumford and Theodore Roszak.[203] Under this view, technological progress is quantifiable, consistent,

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199. *See* Graham v. John Deere Co., 383 U.S. 1, 9 (1966) (quoting Thomas Jefferson).

200. *See* Oddi, *supra* note 11, at 1112, 1148; Priest, *supra* note 14, at 21 (noting that "in the current state of knowledge, economists know almost nothing about the effect on social welfare of the patent system or of other systems of intellectual property."); STAFF OF THE SUBCOMM. ON PATENTS, TRADEMARK, AND COPYRIGHTS OF THE SENATE COMM. ON THE JUDICIARY, 85TH CONG., 2D SESS., AN ECONOMIC REVIEW OF THE PATENT SYSTEM 79 (Comm. Print 1958) (Study No. 15) (Fritz Machlup) ("No economist, on the basis of present knowledge, could possibly state with certainty that the patent system, as it now operates, confers a net benefit or a net loss on society.").

201. *See* RICHARD C. LEVY, THE INVENTOR'S DESKTOP COMPANION: A GUIDE TO SUCCESSFULLY MARKETING AND PROTECTING YOUR IDEAS 7 (1991).

202. Edmund Kitch, Graham v. John Deere Co.: *New Standards for Patents*, 1966 SUP. CT. REV. 300-01 n.35; H.A. TOULMIN, JR., PATENTS AND THE PUBLIC INTEREST 15 (1939).

203. *See* SAMUEL C. FLORMAN, THE EXISTENTIAL PLEASURES OF ENGINEERING 45-56 (1976).

and inescapable.[204] Further, as inventions technically superior to those in the prior art appear, their adoption by society is inevitable.[205] Thus, society is unable to halt the unavoidable march of technology, which "reigns alone, a blind force and more clear-sighted than the best human intelligence."[206] Patent law serves as merely the gentlest of prods in an era of "autonomous technology," which progresses according to its own needs, rather than those of humankind.[207]

Although such a view may seem extreme, it is supported by considerable economic literature aimed at identifying, illustrating and predicting technological growth. Some theories describe a linear process of growth;[208] others, a geometric progression;[209] and still others, including those advanced by Joseph Schumpeter, a leading figure in the economics of technological change who continues to influence many patent scholars,[210] a cyclical pattern with long waves of industrialization.[211] Relying upon such factors as energy efficiency, agricultural yields, the improving performance of various machines, and often patent statistics, these economic studies invariably show a steady, ceaseless pattern of technological progress. Such theories imply not just a steady stream of invention, of course, but their inevitable adoption by society.

One need not spend many hours leafing through the federal reporters to find the influence of the philosophy of technological inevitability in published patent decisions. One example is Judge

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204. Marvin Kranzberg, *Confrontation: Technology and Social Environment*, *in* THE TECHNOLOGICAL CATCH AND SOCIETY 68-69 (Iraj Zandi ed., 1975) ("...technology determines the entire patterns of our lives, actions, values and institutions").

205. *Id.* at 69.

206. JACQUES ELLUL, THE TECHNOLOGICAL SOCIETY 94 (John Wilkinson trans., 1964).

207. *See* John E. Jalbert, *Phenomenology and the Autonomy of Technology*, *in* TECHNOLOGY AND RESPONSIBILITY, *supra* note 191, at 85.

208. *See, e.g.*, EDWARD J. MALECKI, TECHNOLOGY AND ECONOMIC DEVELOPMENT: THE DYNAMICS OF LOCAL, REGIONAL AND NATIONAL CHANGE 114-17 (1991).

209. *See* ELLUL, *supra* note 206, at 91.

210. *See* Merges, *supra* note 4, at 843-46.

211. *See* JOSEPH A. SCHUMPETER, BUSINESS CYCLES 86-87 (1939); Nathan Rosenberg & Claudio R. Frischtak, *Technological Innovation and Long Waves*, *in* DESIGN, INNOVATION AND LONG CYCLES IN ECONOMIC DEVELOPMENT 5 (Christopher Freeman ed., 1986); S. Gomulka, *"Technological Revolution" as an Innovation Superwave in the World Technological Frontier Area*, *in* TECHNOLOGICAL AND SOCIAL FACTORS IN LONG TERM FLUCTUATIONS (Massimo Di Matteo et al. eds., 1986); NIKOLAI KONDRATIEFF, THE LONG WAVE CYCLE 65-69 (Guy Daniels trans., 1984); COLIN NORMAN, THE GOD THAT LIMPS: SCIENCE AND TECHNOLOGY IN THE EIGHTIES 104-09 (1981). As Arnold Pacey notes, this theory tends to be at its most attractive during periods of economic recession. PACEY, *supra* note 4, at 31.

Posner's opinion in *Roberts v. Sears, Roebuck and Co.*, which concluded that the patent at issue was invalid for obviousness because the invention it disclosed "would have been made anyway, and soon."[212] Underlying this position, of course, is the Spencerian conviction that fundamental economic forces render some measure of technological progress unavoidable.[213] Chief Justice Burger confirmed this notion of the relentless march of technology in *Kewanee Oil Co. v. Bicron Corp.*:

> The ripeness-of-time concept of invention, developed from the study of the many independent multiple discoveries in history, predicts that if a particular individual had not made a particular discovery others would have, and in probably a relatively short period of time. If something is to be discovered at all very likely it will be discovered by more than one person.[214]

A more extreme version of this view is not an uncommon one outside of patent law. The guidebook to the Chicago World's Fair of 1933 described how "science discovers, genius invents, industry applies, and man adapts himself to, or is moulded by, new things." Ultimately, "entire races of men" are compelled to "fall into step with . . . science and industry . . . Science finds—Industry applies—Man conforms."[215] This belief has led to such statements as "the development of steam for the factory . . . produced a new economic system: capitalism"[216] and "safe elevators developed by Otis and his successors are perhaps the sole element responsible for the towering cities of today."[217]

A theory of technological neutrality stands in ironic opposition to the theories of technology of early supporters of the patent system.

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212. 697 F.2d 796, 798 (7th Cir.), *rev'd, en banc*, 723 F.2d 1324 (7th Cir. 1983). Here, the court relied upon Professor Kitch's seminal article on Graham v. John Deere Co., which advanced the view that the patent system operates most effectively when it grants exclusive rights only to "those innovations that would not be developed absent a patent system." Kitch, *supra* note 211, at 293, 301. *See also* Robert P. Merges, *Uncertainty and the Standard of Patentability*, 7 HIGH TECH. L.J. 1, 29 (1992).

213. Kitch, *supra* note 202, at 302. ("But the central point is that not every innovation needs the patent system to induce its appearance. In fact in many cases, the desire to obtain a superior competitive position by being known as 'advanced' and first on the market will induce the appearance of the new product or process."). Among the conclusions of the nineteenth century sociologist and philosopher Herbert Spencer was that human progress was inevitable. *See* RICHARD HOFSTADTER, SOCIAL DARWINISM IN AMERICAN THOUGHT 40 (1967).

214. 416 U.S. 470, 490 (1974) (citations omitted).

215. PACEY, *supra* note 4, at 25.

216. *Id.* at 18 n.12.

217. Patent Office Historical Collection, U.S. Patents: 1994 Calendar (1994).

Consider Jeremy Bentham, who reasoned that the availability of patent protection "cause[d] that to be produced which, had it not been for this security given to the fruits of industry, would not have been produced . . . ."[218] Few contemporary supporters of the patent system would go as far as Bentham did. Observers instead view the patent law as fulfilling lesser roles, such as encouraging research and development efforts[219] or channeling technological efforts toward inventions society considers useful.[220] Given the patent law's vitiated utility requirement, this last goal must also be considered extremely suspect.

## E. Philosophical Underpinnings

A claim of this Article is that by paying scant attention to technology as a philosophical concern, patent law scholars have neglected extraordinarily interesting thought capable of providing valuable insights into the patent system. To demonstrate, this section will review the thought of Aristotle, Marx and Heidegger, three philosophers who, in varying degrees, have addressed technology as a philosophical concern in their works. It will then apply their teachings to the problem of the pioneer invention. It is the position of this Article that the thought of Aristotle and Marx provides an historical basis for the fundamental technological values prevalent in modern Western thought and embedded in the patent law.

"Every art and every inquiry, and similarly every action and pursuit, is thought to aim at some good . . . ."[221] With these words Aristotle opened his *Nicomachean Ethics*, a work in which he attempted to describe the best way of life for humanity. Aristotle reasoned that the best good for humankind is happiness, and that the best way to achieve happiness is through thought and reason.[222] Therefore, to Aristotle, a life of theoretical contemplation presents the highest good: it is desirable in and of itself, a source of happiness independent of the activities of others, and something we

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218. BENTHAM, *supra* note 3, at 261-64.

219. *E.g.*, STAFF OF THE SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHTS OF THE SENATE COMM. ON THE JUDICIARY, 84TH CONG., 2D SESS., THE PATENT SYSTEM AND THE MODERN ECONOMY 4 (Comm. Print 1957) (Study No. 2) (George E. Frost).

220. *E.g.*, ARTHUR C. PIGOU, THE ECONOMICS OF WELFARE 185 (4th ed. 1952); FRANK W. TAUSSIG, INVENTORS AND MONEY-MAKERS 50 (1915).

221. ARISTOTLE, THE NICOMACHEAN ETHICS 1 (David Ross trans., revised by J.L. Ackrill and J. O. Urmson, reprinted 1986) (1925).

222. *E.g.*, *id.* at 266.

can perform continuously.[223] Aristotle thus subordinated pragmatic activity to the theoretical to an extraordinary degree. The famous commentary of St. Thomas Aquinas, perhaps the supreme interpreter of Aristotle, summarizes this position well:

> All knowledge is obviously good because the good of any thing is that which belongs to the fulness of being which all things seek after and desire; and man as man reaches fulness of being through knowledge. Now of good things some are just valuable, namely, those which are useful in view of some end—as we value a good horse because it runs well; whilst other good things are also honourable: namely, those that exist for their own sake, for we give honor to ends, not to means. Of the sciences some are practical, others speculative; the difference being that the former are for the sake of some work to be done, while the latter are for their own sake. The speculative sciences are therefore honourable as well as good, but the practical are only valuable.[224]

However, Aristotle also recognized that, as humans, we cannot always lead a contemplative life. Not all of us have such a disposition; and even those capable of the contemplative lifestyle possess essential needs and irrational aspects that reason alone cannot fulfill. Further, a stable society that fulfills basic needs must exist before a contemplative life can occur. Thus, Aristotle reasoned that a secondary sort of happiness lies in virtuous public activity. Political science is the supreme discipline within the state, responsible for ordering other disciplines and setting their proper limits.[225]

Aristotle viewed technological pursuits as a lower sort of endeavor beneath philosophical and political activity. Aristotle recognized that technology is necessary to humankind, as a source of sustenance and shelter; but it is only necessary.[226] It is thus not

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223. *Id.* at 263-64.

224. ARISTOTLE'S DE ANIMA IN THE VERSION OF WILLIAM OF MOERBEKE AND THE COMMENTARY OF ST. THOMAS AQUINAS 45 (Kenelm Foster & Silvester Humphries eds., 1954).

225.

> And politics appears to be of this nature; for it is this that ordains which of the sciences should be studied in a state, and which each class of citizens should learn and up to what point they should learn them; . . . now, since politics uses the rest of the sciences, and since, again, it legislates as to what we are to do and what we are to abstain from, the end of this science must include those of the others, so that this end must be the good for man.

ARISTOTLE, *supra* note 221, at 2.

226. ARISTOTLE, *Metaphysics*, *in* THE COMPLETE WORKS OF ARISTOTLE, Vol. II 1552, 1553 (Jonathan Barnes ed., 1984) (Book IA at 981b1).

inherently a value-laden activity, instead being only a means to accomplish activities which express values. To Aristotle, then, the worth of technology could only be judged by the use to which it is put; it has no other meaning.

Given the pragmatism of Aristotle's writings, his view on technology is somewhat surprising and therefore perhaps particularly profound. Indeed, this same individual, who practiced the medical arts, propounded an early version of empiricism,[227] and gathered everything from zoological specimens to state constitutions in the grove of the Lyceum, nonetheless found practical pursuits to be merely the understanding of the "variable, contingent and relative," and therefore less worthy.[228] Aristotle's works include detailed treatises on how to construct an argument, or write a poem or speech, but little on the creation of anything that would be described today as technological.[229] And although Aristotle often expresses admiration for the works of nature in his writings, his regard for the products of human artificers was undoubtedly far less.[230]

Aristotle's treatment of technology, which he groups with a number of other disciplines like economics and military science, cannot said to be a thorough one. Nonetheless, even this brief review of Aristotle's view on technology indicates the stress he places upon technology's neutrality. That such a conception of technology is not the product of casual reasoning, but instead has roots in fundamental Western thought, is perhaps the most significant insight into the structure of patent law that we can gain from his works.

As this Article will argue, however, the position of technological neutrality is overly simplistic.[231] It is perhaps far more fitting for ancient Greek society than contemporary life. In stark contrast to a modern world where the reach of technology seemingly has no visible boundaries, the Greeks were notorious technological underachievers.[232] Numerous aspects of their society showed little

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227. JOHN HERMAN RANDALL, JR., ARISTOTLE 95-98 (1960). Empiricism, as later propounded by such figures as Locke, George Berkeley and David Hume, holds that human knowledge fully or partly depends upon sense-based experience. A.R. LACEY, A DICTIONARY OF PHILOSOPHY 61-62 (2d ed. 1986).

228. RANDALL, *supra* note 227, at 163.

229. *See* ARISTOTLE, *Topics, in* Barnes, Vol. I *supra* note 226, at 167; ARISTOTLE, *Rhetoric, in* Barnes, Vol. II, *supra* note 226, at 2152; ARISTOTLE, *Poetics, in* Barnes, Vol. II, *supra* note 226, at 2316.

230. RANDALL, *supra* note 227, at 163.

231. *See infra* notes 321-342 and accompanying text.

232. *See, e.g.*, DANIEL J. BOORSTIN, THE CREATORS 55-56 (1992).

regard for technologists; many city-states, for example, denied artisans and technicians the opportunity to become citizens. Of course, what we know of Greek thought comes primarily from their writers, not their technologists. In this vein, observers such as Samuel Florman find little wonder that philosophers like Aristotle recommend the pursuit of a philosophical way of life.[233] Florman finds alternative conceptions in Greek thought in sources such as Homer, noting his admiration of technical skill and the material world of human-made objects.[234]

After the early works of Aristotle, philosophy had little to offer students of technology until the nineteenth century, when Karl Marx developed a body of technological thought.

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233. FLORMAN, *supra* note 203, at 102.

234. *Id.* at 104-10. Florman quotes extensively from The Odyssey of Homer. He includes the following passage, a significant example of technological description:

> She gave him a great ax that was fitting to his palms and headed
> With bronze, with a double edge each way, and fitted inside it
> A very beautiful handle of olive wood, well hafted;
> Then she gave him a well-finished adze, and led the way onward
> To the far end of the island where there were trees, tall grown,
> Alder and black poplar and fir that towered to the heaven,
> But all gone dry long ago and dead, so they would float lightly.
> But when she had shown him where the tall trees grew, Kalypso,
> Shining among divinities, went back to her own house
> While he turned to cutting the timbers and quickly had his work finished.
> He threw down twenty in all, and trimmed them well with his bronze ax,
> And planed them expertly, and trued them straight to a chalkline.
> Kalypso, the shining goddess, at that time came back, bringing him
> An auger, and he bored through them all and pinned them together
> With dowels, and then with cords he lashed his raft together.
> And as great as is the bottom of a broad cargo-carrying ship,
> When a man well skilled in carpentry fashions it, such was
> The size of the broad raft made for himself by Odysseus.
> Next, setting up the deck boards and fitting them to close uprights
> He worked them on, and closed in the ends with sweeping gunwales.
> Then he fashioned the mast, with an upper deck fitted to it,
> And made in addition a steering oar by which to direct her,
> And fenced her in down the whole length with wattles of osier
> To keep the water out, and expended much timber upon this.

FLORMAN, *supra* note 203, at 106-107 (quoting THE ODYSSEY OF HOMER Bk. 5, *ll.* 234-57 (Richmond Lattimore trans., 1965)).

At first blush, Marx seems an extremely unlikely source of insights into patent law. His ceaseless call for the abolition of private property leaves little doubt as to whether he would support exclusive rights to individual inventors.[235] Ignoring the profound emphasis Marx placed upon technology in his thought, however, would be extremely short-sighted in reviewing the philosophical underpinnings of patent law. In its necessarily but brutally brief review of Marxian philosophy, this Article will focus upon Marx's technological views and compare them with the values underpinning patent law.

Most readers are undoubtedly familiar with the primary elements of Marx's works. Marx emphasized humans as material beings, compelled by our nature to meet organic demands for things like food and shelter. The pressure of these needs is, to Marx, our motivating force, causing humanity to enter into conscious production; that is its unique trait.[236] Historically, productive forces may be arranged into five so-called "modes of production"—Asiatic, ancient, feudal, capitalist and socialist—each period marked by an essential technology directed towards the fulfillment of human needs. Marx viewed the capitalist mode of production as dominated by the factory system, and accompanied by such institutions as private property, market production and the use of money.

The technologies that comprise the material modes of production play a central role in Marxian thought.[237] Marx conceived modes of production as the ultimate environment in which humankind exists. In a Marxian sense, individuals define themselves through their interaction with their environment—their mode of production—and with each other. Thus, technology embodies what humanity is in a quite fundamental way.[238]

Marx asserted that although the modes of production have changed throughout history, they share the common feature of control by a few, to the detriment of the masses. As individuals grow increasingly dependent upon others and alienated from their own

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235. *E.g.*, KARL MARX & FRIEDRICH ENGELS, BASIC WRITINGS ON POLITICS AND PHILOSOPHY 23-24 (Lewis S. Fever ed., 1959) (quoting KARL MARX, THE MANIFESTO OF THE COMMUNIST PARTY).

236. Joseph Cropsey, *Karl Marx, in* HISTORY OF POLITICAL PHILOSOPHY 802, 803 (Leo Strauss & Joseph Cropsey eds., 3d ed. 1987) [hereinafter HISTORY OF POLITICAL PHILOSOPHY].

237. KOSTAS AXELOS, ALIENATION, PRAXIS, & TECHNE IN THE THOUGHT OF KARL MARX 331 (Ronald Bruzina trans., 1976).

238. *Id.*

existence, their loss is reflected in greater society through the formation of competing classes. This process reaches its heights in capitalist societies, where increasingly specialized laborers become less than human, achieving only a fraction of what is possible for them and coming to dread the labor that should serve as a source of satisfaction to them. Marx predicted that these destructive aspects of capitalism are the key to its own collapse.[239] In its place would rise a socialist-communist society marked by cooperation and rational planning. Humans will then cease to live at each other's expense, and, with the help of technology designed to lessen the burdens of workers, become masters of themselves and their society.[240]

Although the extraordinary wealth of Marx's thought has inspired countless interpretations, our review of his thought can fortunately be more limited to his technological observations. As Joseph Schumpeter has suggested, the traditional view of Marxian technological theory encompasses both technological determinism and inevitability.[241] This reading of Marx first holds that technological development is unavoidable. As stated in the *Grundrisse*:

> [O]nce absorbed into the production processes of capital, the means of labour undergoes various metamorphoses, of which the last is the machine, or rather, an automatic system of machinery ("automatic" meaning that this is only the most perfected and most fitting form of the machine, and is what transforms the machinery into a system). This is set into motion by an automaton, a motive force that moves of its own accord. The automaton consists of a number of mechanical and intellectual organs, so that the workers themselves can be no more than the conscious limbs of the automaton.[242]

Further, under this reading of Marx, not only is technological development inevitable, but the shape technology assumes has a controlling effect upon the rest of society. The entire fabric of society results from the conditioning of men by their manmade environment, i.e., by their mode of production. Under this reading, social change is solely determined by technological advance.[243] Humans are thus unable to choose their ethical, religious and political systems, which

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239. HISTORY OF POLITICAL PHILOSOPHY, *supra* note 236, at 813.

240. *See* ARNOLD PACEY, THE MAZE OF INGENUITY: IDEAS AND IDEALISM IN THE DEVELOPMENT OF TECHNOLOGY 273-275 (1974).

241. JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY 11-12 (3d ed. 1950).

242. KARL MARX, GRUNDRISSE 132 (David McLellan trans., 1971).

243. *See* LESLIE A. WHITE, THE SCIENCE OF CULTURE 365 (1971); Tribe, *supra* note 192, at 650 n.116.

instead depend upon the forces of production available to that society. This view of extraordinary technological determinism has ample textual support. Consider, for example, a passage from Marx's letter to P.V. Annenkov:

> Assume a particular state of development in the productive forces of man and you will get a particular form of commerce and consumption. Assume particular stages of development in production, commerce and consumption and you will have a corresponding social structure, a corresponding organization of the family, of orders or of classes, in a word, a corresponding civil society. Presuppose a particular civil society and you will get particular political conditions which are only the official expression of civil society.[244]

As he stated more concisely in *The Poverty of Philosophy*: "The handmill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist."[245]

Scholarly debate continues, however, on whether the entirety of Marx's thought reflects both determinism and inevitability. Indeed, other portions of his works suggest diametrically opposed views of technology. As Marx repeatedly noted, "men make their own history" and are not captive to external forces such as autonomous technology.[246] Others further excuse Marx for his various statements of technological determinism, considering them to be misinterpreted

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244. Letter from Marx to P.V. Annenkov (December 28, 1846) *in* KARL MARX, THE POVERTY OF PHILOSOPHY 151, 152 (C.P. Dutt & V. Chattopadhyaya eds., 1935) [hereinafter MARX, THE POVERTY OF PHILOSOPHY]. *See also* KARL MARX, A CONTRIBUTION TO THE CRITIQUE OF POLITICAL ECONOMY 20-21 (1971):

> In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness. At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or—this merely expresses the same thing in legal terms —with the property relations within the framework of which they have operated hitherto. From forms of development of the productive forces these relations turn into their fetters.

245. MARX, THE POVERTY OF PHILOSOPHY, *supra* note 244, at 105.

246. Karl Marx, *The Eighteenth Brumaire of Louis Bonaparte*, *in* BASIC WRITINGS ON POLITICS AND PHILOSOPHY: KARL MARX AND FRIEDRICH ENGELS 318, 320-21 (Lewis S. Feuer ed., 1959).

aphorisms or to have arisen in the heat of debate.[247] Additional passages from Marx suggest that technological progress is not immune to social forces. Marx indicated that "it would be possible to write quite a history of inventions, made since 1830, for the sole purpose of supplying capital with weapons against the revolts of the working class" and that science "is the most powerful weapon for repressing strikes, those periodical revolts of the working class against the autocracy of capital[.]"[248] The familiar opening of the *Communist Manifesto* also suggests that technology need not be the sole determinant of social changes;[249] to similar effect is language buried in

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247. *See* Nathan Rosenberg, *Marx as a Student of Technology, in* INSIDE THE BLACK BOX: TECHNOLOGY AND ECONOMICS 34 (1982). *Cf.* FRIEDRICH NIETZSCHE, THE GAY SCIENCE (Walter Kauffman trans., 1974). 182 n.20 (commentary by Walter Kaufmann on the danger of the false assumption that Nietzsche's THE GAY SCIENCE is "merely a random collection of 'aphorisms' that are intended for browsing.").

248. KARL MARX, CAPITAL 475 (Frederich Engels ed., International Publishers edition 1992). *See* Richard W. Miller, *Social and political theory: Class, state, revolution, in* THE CAMBRIDGE COMPANION TO MARX 55, 57 (Terrell Carver ed., 1991) ("First, the capitalists determine the shape of technology. In the face of any long-term shortage of labor power, they can instruct their engineers to emphasize labor-saving innovations.").

249.

> The discovery of America, the rounding of the Cape, opened up fresh ground for the rising bourgeoisie. The East-Indian and Chinese markets, the colonization of America, trade with the colonies, the increase in the means of exchange and in commodities generally, gave to commerce, to navigation, to industry, an impulse never before known, and thereby, to the revolutionary element in a tottering feudal society, a rapid development.
>
> The feudal system of industry, under which industrial production was monopolized by closed guilds, now no longer sufficed for the growing wants of the new markets. The manufacturing system took its place. The guild-masters were pushed on one side by the manufacturing middle class; division of labor between the different corporate guilds vanished in the face of division of labor in each single workshop.
>
> Meantime the markets kept ever growing, the demand ever rising. Even manufacture no longer sufficed. Thereupon, steam and machinery revolutionized industrial production. The place of manufacture was taken by the giant, Modern Industry, the place of the industrial middle class, by industrial millionaires, the leaders of whole industrial armies, the bourgeois.
>
> Modern industry has established the world-market, for which the discovery of America paved the way. This market has given an immense development to commerce, to navigation, to communication by land. This development has, in its turn, reacted on the extension of industry; and in proportion as industry, commerce, navigation, railways extended, in the same proportion the bourgeoisie

a footnote from *Capital*.[250] The simple expedient of providing a broader reading to the term "modes of production" to encompass not simply technology, but also labor power as well as human skill and experience, is itself a potent counter argument to the traditional reading of Marxian technological philosophy.[251]

Even if one accepts the traditional reading of Marx's views on technology as deterministic and inevitable, any nexus between Marx and patent law doctrines may seem quite attenuated. Yet the founder of Marxism was also among the intellectual forebears of the American technological utopianism movement, which shifted utopian hopes for America from Puritanical notions of divine providence to a more pragmatic, technologically based vision of a better society.[252] By the late nineteenth century, millions of Americans subscribed to a belief in the inevitability of technological progress and its social effects.[253] The rule of law developed during that era reflects these beliefs. Indeed, the correlation between the decline in the vigor of the patent system[254] and growing social distrust in technology is quite noticeable. A lesser, but still notable, nexus can also be drawn between Marx and

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> developed, increased its capital, and pushed into the background every class handed down from the Middle Ages.

MARX & ENGELS, *supra* note 235, at 59-60.

250.

> A critical history of technology would show how little any of the inventions of the 18th century are the work of a single individual. Hitherto there is no such book. Darwin has interested us in the history of Nature's Technology, i.e., in the formation of the organs of plants and animals, which organs serve as instruments of production for sustaining life. Does not the history of the productive organs of man, of organs that are the material basis of all social organisation, deserve equal attention? And would not such a history be easier to compile, since, as Vico says, human history differs from natural history in this, that we have made the former, but not the latter? Technology discloses man's mode of dealing with Nature, the process of production by which he sustains his life, and thereby also lays bare the mode of formation of his social relations, and of the mental conceptions that flow from them.

MARX, *supra* note 248, at 352 n.2.

251. *See, e.g.*, Donald MacKenzie, *Marx and the Machine*, 25 TECH. & CULTURE 473, 476-77 (1984).

252. HOWARD P. SEGAL, TECHNOLOGICAL UTOPIANISM IN AMERICAN CULTURE 69-72 (1985).

253. *Id.* at 19-44.

254. CHISUM, *supra* note 35, at OV-9.

patent law as one of his keenest observers, Joseph Schumpeter,[255] strongly influenced patent law scholarship.[256]

The traditional reading of Marx's position is now rendered too extreme to be acceptable.[257] Marx's determinist views of technology must be seen as rather disappointing. The emphasis Marx ultimately placed upon class struggle resulted in a movement away from his focus on man as a material, observable being. Thus, Marx stepped away from an analysis of the everyday world which makes up man's environment, and thus from technology as well.[258]

Legal scholars have frequently, and productively, borrowed from philosophical studies as a means of considering the various regimes of intellectual property.[259] In doing so, they have stressed intellectual property regimes as systems of property. Certainly the foundational philosophic text for these studies is Locke's *Second Treatise*,[260] which has recently received several exhaustive treatments. A second source lies in the works of Hegel, who discussed intellectual property laws in his most important political text, *The Philosophy of Right*.[261]

The crux of Locke's celebrated argument concerning property is that divine authority created the world as a universal common, in which all individuals possessed an equal right.[262] An exception to this rule lies in the person of each individual, over which each individual enjoys a property right.[263] Not only is an individual's person his own, but "the labor of his body and the work of his hands, we may say, are properly his," as the immediate extension of his person.[264] A significant condition qualifies this labor-based property right: whenever an individual removes something from the common, there must remain "enough and as good left in common for others."[265]

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255. *See* Nathan Rosenberg, *Schumpeter and Marx: How Common A Vision?*, *in* TECHNOLOGY AND THE HUMAN PROSPECT 197 (Roy M. MacLeod ed., 1986).

256. *See supra* note 210.

257. *See infra* notes 343-368 and accompanying text.

258. ALBERT BORGMANN, TECHNOLOGY AND THE CHARACTER OF CONTEMPORARY LIFE 84-85 (1984).

259. *See supra* note 1.

260. LOCKE, *supra* note 2.

261. HEGEL, *supra* note 3.

262. LOCKE, *supra* note 2, at § 25.

263. *Id.* at § 27.

264. *Id.*

265. *Id.*

Applied to the production of technological ideas, Locke's labor theory of property provides a compelling rationale for the patent system.[266]

In contrast, Hegel reasoned that property results from the expression of individual will.[267] To Hegel, personality and other aspects of human existence are due to the will's continuous effort to impose itself upon the world.[268] Hegel recognized that the interaction of human will with the external world occurs in part through the occupation and embodiment of external, enduring objects, which society recognizes as property.[269] Importantly for students of intellectual property, however, Hegel realized that physical objects need not be the only subject of property protection; creative expression and the embodiment of ideas are also worthy of protection through a system of exclusive rights.[270] As expressed in intellectual property schemes such as patent protection, Hegelian notions of property provide a suitable mechanism for self-actualization, personal expression, and recognition of the dignity and worth of an individual person.[271]

Although a rather extensive literature applies Lockean and Hegelian thought to our system of patents and other intellectual property rights, scant comparison of other philosophical studies to the patent system has occurred. Surprisingly enough, thinkers such as Aristotle, Karl Marx and Martin Heidegger,[272] who assigned technology a role in their thought from peripheral to central, have received little attention in relation to the patent law. This absence is unexpected but not inexplicable. Theories of property, particularly that espoused by Locke, are fundamental to our constitutional order, of broad application to many legal settings, and well understood by a wide audience.[273] In contrast, the philosophy of technology presents a

266. *See* Hughes, *supra* note 1, at 296-330. *But see* Gordon, *supra* note 1; ROBERT NOZICK, ANARCHY, STATE AND UTOPIA 181-82 (1974) (both discussing limits to intellectual property rights under Lockean theories).

267. HEGEL, *supra* note 3, at 40.

268. *Id.*

269. *Id.* at 40-41.

270. *Id.* at 40-41. *See* Hughes, *supra* note 1, at 337-39.

271. Hughes, *supra* note 1, at 340.

272. This list is by no means exhaustive. For instance, John Dewey is another important thinker who has considered technology. *See* LARRY A. HICKMAN, JOHN DEWEY'S PRAGMATIC TECHNOLOGY (1990). In a recent work, Paul Durbin names contemporary thinkers Albert Borgmann, Don Ihde, Carl Mitcham, Kristen Shracer-Frechette and Langdon Winner as the foremost technological philosophers. PAUL DURBIN, BROAD AND NARROW INTERPRETATIONS OF PHILOSOPHY OF TECHNOLOGY xvi n.1 (1990).

273. *See, e.g.*, RICHARD EPSTEIN, TAKINGS—PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN (1985).

nascent field of study. One noted scientific philosopher remarked that the philosophy of technology "is still immature and uncertain of its very object, and does not exploit the entire scope of its own possibilities. That it is an underdeveloped branch of scholarship is suggested by the fact that so far no major philosopher has made it his central concern or written an important monograph about it."[274] Although these claims are certainly overstated, few would doubt that philosophers have come late to technology.[275]

Additionally, many scholars may not wish to confine themselves to the patent law, instead considering the full spectrum of intellectual property doctrines. As the systems of copyright, trademark, trade secret and unfair competition law do not embrace technology to the extent the patent law does, critical thinking regarding technology may be relevant only at the peripheries of these other intellectual property regimes.[276] The possibility of a philosophy of technology is also simply one that has not occurred to many individuals. Indeed, such a philosophy may seem almost incongruous, as the workings of technology appear extraordinarily far removed from the abstract contemplation that traditionally comprises philosophical inquiry. Samuel Florman notes the common perception that:

> If people are entranced with trinkets, how can they plumb the depths of their spirit? If they are absorbed in analyzing systems and designing physical objects, how can they remain open for an encounter with Being? If they seek comfort, how can they expect to find truth?[277]

At a minimum, such conceptions make little of the Husserlian turn of philosophy to phenomenology, a school of thought which seeks to describe the phenomena of existence as they appear, without the intervention of theoretical constructions.[278] Ultimately, however, critical thinking about technology—that which is called the controlling power of our age—needs no justification.[279]

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274. Mario Bunge, *Five Buds of Techno-Philosophy*, 1 TECH. IN SOC'Y 68 (1979).

275. *See, e.g.*, Albert Borgmann & Carl Mitcham, *The Question of Heidegger and Technology*, 31 PHIL. TODAY 97, 108 (1987).

276. As the other intellectual property regimes are forced to address technology, though, this claim is increasingly less true. *See e.g.* Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 997 (1993).

277. FLORMAN, *supra* note 203, at 101.

278. *See* Edmund Husserl, *Philosophy as Rigorous Science, in* PHENOMENOLOGY AND THE CRISIS OF PHILOSOPHY (Q. Lauer trans., 1965).

279. *See, e.g.*, Hood, *supra* note 193, at 356; Thomas Carlyle, *The Mechanical Age, in* NATURE AND INDUSTRIALIZATION: AN ANTHOLOGY, 229, 229 (Alasdaire Clayre ed.,

## III. AN ALTERNATE CONCEPTION OF TECHNOLOGY

The case for technological neutrality and inevitability is not made beyond question. History provides examples both of non-neutral technologies that have profoundly altered social systems and of technologies that seemed inevitable but were rejected or not adopted by societies. A look at the work of Martin Heidegger provides the philosophical basis for rejecting patent law's view of technology as a dominating, neutral, inevitable force.

### A. To A New Philosophy of Technology: Beyond Aristotle and Marx

Martin Heidegger, a twentieth-century German existentialist philosopher, presents a figure of extreme controversy. Sometimes dismissed for his tortuous style, often disregarded as a linguistic charlatan,[280] and uniformly held in contempt for his detestable affiliation with the Nazi movement,[281] Heidegger still remains an intriguing figure, for many would place him as the foremost philosopher of the century, with an influence on a bewildering array of disciplines.[282] Regardless of the status one would accord Heidegger, he was the first to consider technology as an issue of central philosophical interest,[283] and his writings, particularly his 1953 lecture *The Question Concerning Technology*[284] and his seminal work *Being and Time*,[285] are of extreme interest to the task at hand.[286]

In contrast to Aristotle and Marx, Heidegger provides a normative basis for technological understanding, which patent law

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1977) ("Were we required to characterise this age of ours by any single epithet, we should be tempted to call it, not an Heroical, Devotional, Philosophical, or Moral Age, but, above all others, the Mechanical Age. It is the Age of Machinery . . . .").

280. *See* GEORGE STEINER, MARTIN HEIDEGGER 4 (1989).

281. Charles B. Guignon, *Introduction, in* THE CAMBRIDGE COMPANION TO HEIDEGGER 26-36 (Charles Guignon ed., 1993) [hereinafter HEIDEGGER COMPANION].

282. For example, literary theory, artificial intelligence, and psychology. STEINER, *supra* note 280, at 5-6.

283. IHDE, TECHNICS AND PRAXIS 103 (1979).

284. MARTIN HEIDEGGER, *The Question Concerning Technology, in* BASIC WRITINGS (David Farrell Krell ed., 1977) [hereinafter HEIDEGGER, *The Question Concerning Technology*].

285. MARTIN HEIDEGGER, BEING AND TIME (John Macquarrie & Edward Robinson trans., 1962).

286. *See generally* Leo Marx, *On Heidegger's Conception of "Technology" and Its Historical Validity*, 25 MASS. REV. 638 (1984); JOHN LOSCERBO, BEING AND TECHNOLOGY: A STUDY IN THE PHILOSOPHY OF MARTIN HEIDEGGER (1981).

scholars should study more closely. Heidegger's goal was to rejuvenate Western thought by recovering a clearer, more vital sense of existence, or being.[287] To Heidegger, concepts central to Western thought such as Platonic Forms, Cartesian mind-body dualism, and Kantian noumena, were the results of derivative, theoretical thinking too far removed from the physical world.[288] Heidegger instead offered a sort of phenomenology: that our most fundamental sense of things comes not from our relationship with objects of knowledge, but with those instrumental objects that fit naturally into our ordinary lives.[289]

Heidegger's most famous example involves the simple use of a hammer.[290] The wielder of the hammer—say, a cobbler in her workshop—takes up her tool within an integrated context of interrelated activities and objects of which the hammer is a part. Other elements of this totality, including tools, nails, materials which make up a shoe, and even the crafting of the product, are assigned a contextual meaning through their interrelationship. The hammer thus must be seen as relative to a context, not as an object in itself. An awareness of this relationship becomes more pronounced as the hammer is used, as the tool itself withdraws from the cobbler's direct experience of hammering, and becomes instead the means of the hammering experience itself.[291] Importantly for Heidegger's argument, skilled use of the hammer implies an understanding which is practical, not conceptual.[292] To Heidegger, this concealed working of pragmatic things defines their being in the physical world.[293]

It is in this sense that Heidegger writes: "Technology is therefore no mere means. Technology is a way of revealing."[294] The essence of technology is thus not merely a mode of production, transportation, or other task, nor can it be described as itself technological.[295] It is instead a fundamental way in which we uncover the presence of things; a "clearing" in which specific forms of human existence, along with the environment of made things, become visible

287. Guignon, *supra* note 281, at 4-5.
288. *Id.* at 4.
289. *Id.* at 10.
290. *See* DON IHDE, TECHNOLOGY AND THE LIFEWORLD 31-34 (1990).
291. Guignon, *supra* note 281, at 10.
292. IHDE, PHILOSOPHY OF TECHNOLOGY, *supra* note 241, at 40.
293. Guignon, *supra* note 281, at 10-11.
294. HEIDEGGER, *supra* note 284, at 318.
295. *Id.* at 311.

in their reciprocal interdependence.[296] According to Heidegger, then, being is a temporal event, a "movement into presence" in which both humans and things are appropriated into intelligibility, and the world objectified.[297]

Paradoxically, we are perhaps most aware of the network of relations in which tools are embedded when something goes awry, such as when a tool is damaged.[298] We then obtain a rudimentary understanding of the complex functional relationships of which the tool was a part. If the breakdown persists, however, individual technologies become increasingly noticeable only in their dysfunction.[299] Individuals then begin to believe the tool is without meaning, its usefulness merely determined by human desires and interests.

But such an understanding—viewing the world as an instrumental tool fit for the disposal of humanity—is inauthentic. Among Heidegger's theses is that Western society reflects this mistaken understanding of being, leading to pragmatic and deleterious consequences: the spread of apocalyptic weaponry, environmental devastation, and ultimately nihilism.[300] Heidegger considers this conception of being as itself a technological one. Thus, in humanity's technological encounter with the world, the world is seen as available for whatever use we care to make of it.[301] The Rhine River itself becomes merely another resource to be tapped:

> The hydroelectric plant is set into the current of the Rhine. It sets the Rhine to supplying its hydraulic pressure, which then sets the turbines turning. This turning sets those machines in motion whose thrust sets going the electric current for which the

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296. Hood, *supra* note 193, at 357.

297. Guignon, *supra* note 281, at 13.

298. "*When an assignment has been disturbed*—when something is unusable for some purpose—then the assignment becomes explicit . . . . When an assignment to some particular 'towards this' has been thus circumspectly aroused, we catch sight of the 'towards this' itself, and along with it everything connected with the work—the whole workshop—as that wherein concern always dwells." HEIDEGGER, *supra* note 285, at 105 (emphasis in original). *See also* Harrison Hall, *Intentionality and the world: Division I of* Being and Time, *in* HEIDEGGER COMPANION, *supra* note 281, at 122, 127.

299. Guignon, *supra* note 281, at 12-13.

300. Drew Leder, *Modes of Totalization: Heidegger on Modern Technology and Science*, 29 PHIL. TODAY 245, 249 (1985); Michael Gillespie, *Martin Heidegger, in* HISTORY OF POLITICAL PHILOSOPHY, *supra* note 236, at 888, 890.

301. T. Maarten & T. Coolen, *Philosophical Anthropology and the Problem of Responsibility in Technology, in* TECHNOLOGY & RESPONSIBILITY, *supra* note 191, at 41-50; Leder, *supra* note 300, at 246; HEIDEGGER, *The Question Concerning Technology*, *supra* note 284.

> long-distance power station and its network of cables are set up to dispatch electricity. In the context of the interlocking processes pertaining to the orderly disposition of electrical energy, even the Rhine itself appears to be something at our command.[302]

Our distorted conception of the being of technology has an even worse consequence. By failing to inquire into the essence of things, and instead viewing them as mere instruments, humans allow all their relations to become technical ones. Everything becomes an asset to be exploited in a calculated way: individuals as useful operators and consumers,[303] friends as efficient members of a network,[304] and natural resources as reserves left for our use,[305] with marginal habits and customs left behind. All activity thus becomes technically oriented, and the only goal of individuals the optimal ordering of resources, for its own sake.[306] To Heidegger, the greatest danger is that "the approaching tide of technological revolution in the atomic age could so captivate, bewitch, dazzle, and beguile man that calculative thinking may someday come to be accepted and practiced *as the only* way of thinking."[307]

Heidegger is no Luddite, however; he never took the route of so many contemporary observers, who naively yearn for a simpler society based upon idealized views of earlier, less technologically sophisticated eras.[308] He realized that "[i]t would be foolish to attack technology blindly.... We depend on technical devices; they even challenge us to ever greater advances."[309] Instead, Heidegger's works suggest two solutions for curbing the "tide of technological revolution."

First, Heidegger teaches the concept of releasement, of stepping beyond a purely instrumental conception of technology.[310] Heidegger

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302. HEIDEGGER, *supra* note 284, at 321.

303. Leder, *supra* note 300, at 248.

304. Hubert L. Dreyfuss, *Heidegger on the Connection Between Nihilism, Art, Technology and Politics*, *in* HEIDEGGER COMPANION, *supra* note 281, at 289, 310.

305. Leder, *supra* note 300, at 250.

306. "Everywhere everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering." Heidegger, *supra* note 284, at 322.

307. MARTIN HEIDEGGER, DISCOURSE ON THINKING 56 (emphasis in original) (John M. Anderson & E. Hans Freud trans., 1966).

308. *See* FLORMAN, *supra* note 203, at 54-55, 72-73 (noting and criticizing such commentators).

309. HEIDEGGER, *supra* note 307, at 53.

310. "Releasement toward things and openness to the mystery belong together. They grant us the possibility of dwelling in the world in a totally different way. They promise us a new ground and foundation upon which we can stand and endure in

argues that we must return to meditative, rather than calculative, thinking;[311] one commentator summarizes Heidegger's position as the belief that "[i]f more people were to question, and to live with their questions, then technological thinking might be slowed down and the saving power fostered."[312] Heidegger thus argues for a shift of paradigms, with greater emphasis placed on the humanizing character of insignificant things—those marginal cultural practices we celebrate for the precise reason that they resist efficiency.[313] Thus "[w]e can affirm the unavoidable use of technical devices, and also deny them the right to dominate us, and so to warp, confuse, and lay waste our nature."[314]

Heidegger also suggests the revival of technology as what the Greeks called *techne*. "Techne is the name not only for the activities and skills of the craftsman, but also for the arts of the mind and the fine arts. Techne belongs to bringing forth . . . ."[315] We can thus enrich our understanding of technological artifacts as part of the created world, appreciating them without reducing them to mere instruments.[316] Heidegger writes that "when we once open ourselves expressly to the essence of technology, we find ourselves unexpectedly taken into a freeing claim."[317] Thus, we will be grateful for technology as we realize it is a primary source through which we can come to understand our lived existence. In this, Heidegger refers to the environment of human artifacts within which we interact for virtually every moment of our lives.[318] Once we attain an understanding of being which embraces technology, then we can see that what is most important to us is not amenable to efficient technological enhancement.[319]

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the world of technology without being imperiled by it." HEIDEGGER, *supra* note 307, at 55. *See* Hood, *supra* note 193, at 353.

311. HEIDEGGER, *supra* note 307, at 56.

312. Jana Sawicki, *Heidegger and Foucault: Escaping Technological Nihilism*, 13 PHIL. & SOC. CRITICISM 155, 167 (1987).

313. Dreyfuss, *supra* note 304, at 310-11.

314. HEIDEGGER, *supra* note 307, at 54.

315. HEIDEGGER, *supra* note 284, at 318.

316. *See* Sawicki, *supra* note 312, at 166.

317. HEIDEGGER, *supra* note 284, at 331.

318. *See* CHELLIS GLENDINNING, WHEN TECHNOLOGY WOUNDS: THE HUMAN CONSEQUENCES OF PROGRESS 43 (1990) (noting "the technological encounter").

319. Dreyfuss, *supra* note 304, at 307. The popular novel ZEN AND THE ART OF MOTORCYCLE MAINTENANCE offers another option, arguing that humankind can reassert its mastery over the machinery of technology by carefully attending to technological

Application of Heidegger's teachings to patent law does not require an extraordinary leap of reasoning. The fundamental technological value expressed in the patent system suffers from the symptom he most decries: a nearsighted view of artifacts, processes and other technologies as simple tools. Seemingly unaware of the diverse cultural factors influencing technological advance, patent law leaves little room for review of policies and nontechnical concerns. Instead, notions of technological neutrality and inevitability prevail, but, as one observer realizes, "if Martin Heidegger is correct, the belief in the neutrality and heteronomy of technology may be the most insidious way of being delivered over to it."[320]

The question remains, however, whether Heidegger was indeed correct. Many of his followers accept the not uncommon view that humankind currently faces some sort of technologically-oriented crisis, a crisis so potent that arguments seeking changes in technological norms are welcome. Others recognize that Heidegger's thought best comports with a perceptive analysis of historical experience and persuasively displays the inadequacies of popular conceptions of technology as rooted in Western thought. Fortunately, the propriety of his approach need not be resolved here. One does not have to accept all of Heidegger's claims to appreciate his provocative arguments, and to consider whether legal values regarding technology deserve reevaluation.

## B. The Historical Case against Technological Neutrality

A look at the societal effects of the snowmobile and other technological inventions shows that technological change is not necessarily neutral.[321] First we consider the case of the snowmobile, familiar to students of technology. Although inventors obtained the first patents on motorized snow vehicles in the 1920s, these early devices were expensive and unreliable.[322] The invention of the Ski-Doo by Joseph-Armaund Bombadier revolutionized the snowmobile

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objects. ROBERT PIRSIG, ZEN AND THE ART OF MOTORCYCLE MAINTENANCE: AN INQUIRY INTO VALUES (1974).

320. John E. Jalbert, *Phenomenology and the Autonomy of Technology*, *in* TECHNOLOGY AND RESPONSIBILITY, *supra* note 191, at 85.

321. *See, e.g.*, PERTTI J. PELTO, THE SNOWMOBILE REVOLUTION 6-12; 165-181 (1973).

322. PELTO, *supra* note 321, at 6-7.

field in the late 1950s.[323] Snowmobiles ultimately became a huge commercial success around the world, adopted by a wide spectrum of cultures for a variety of uses.

At first blush, the snowmobile appears to be a technologically neutral invention. Whether a snowmobile is used for cross-country racing in Michigan, reindeer herding in Finland, fox trapping on Canada's Banks Island, oil prospecting in Alaska, or any of a number of other purposes, the engineering principles are the same. It appears to be a neutral tool, adopted by a number of differing societies for their own objectives.

A more thorough examination of history, however, demonstrates that the introduction of the snowmobile into various socio-economic systems resulted in sometimes remarkable shifts within those systems. Rather than being a mere instrument to serve existing social goals, the snowmobile altered those goals themselves. As with the automobile, a host of human consequences attended the introduction of the snowmobile to North America. Ownership of a snowmobile, and the skilled ability to use it, became a status symbol.[324] The snowmobile also brought about tourist trails, driving schools, and organized races.[325] As its users found themselves increasingly dependent upon others to supply fuel and spare parts, the institution of snowmobiling caught the attention of legislatures, which enacted laws limiting the ecologically destructive uses of snowmobiles.[326]

Perhaps the most startling societal change caused by the introduction of the snowmobile was presented by Professor Partti J. Pelto in his classic study of the Skolt Lapps of northeastern Finland.[327] The Skolts were a reindeer-herding people, using the animals to provide food, transportation, clothing and other needs.[328] Following their exodus from Russia after World War II, the Skolts built a remarkably egalitarian society.[329] Wealth varied little

323. The Ski-Doo, which combined prior snowmobile technology with an extremely efficient two-stroke, single-cylinder engine, *see* PELTO, *supra* note 321, at 6-7, likely constitutes a classic "combination" invention that under Supreme Court precedent may not even be eligible for patent protection. *E.g.*, Sakraida v. Ag Pro, Inc., 425 U.S. 273, 281 (1976); Anderson's Black Rock, Inc. v. Pavement Salvage, 396 U.S. 57, 62 (1969); Great Atlantic & Pacific Tea Co. v. Supermarket Equip. Co., 340 U.S. 147, 152 (1950) (an invention combining old elements must achieve "synergism" to be patentable).

324. PACEY, *supra* note 4, at 2-3.

325. *Id.*

326. PELTO, *supra* note 321, at 7-8.

327. *Id.*

328. *Id.* at 22-23.

329. *Id.* at 26-29.

among individuals; the transported families even lived in identical, government-constructed cabins.[330]

Prior to the advent of the snowmobile, Skolt reindeer herding was a controlled, cyclical process.[331] As winter approached, the scattered, free-roaming reindeer would gather into herds for breeding and to obtain protection from the elements. At this time, ski-clad Skolt herders would gather to lead the reindeer into corrals. This was ordinarily accomplished by a single skier leading a kilometer-long, single file of reindeer into a corral, with herdsmen and dogs set along the flanks to ensure an orderly procession. The Skolts would then divide the animals based upon individual ownership, as indicated by ear markings. Owners would then butcher or otherwise process individual reindeer. Following calving in the spring, unidentified animals were marked and the herds set loose.

The situation dramatically changed when the Skolts first purchased snowmobiles in the early 1960s. Snowmobiles possessed extraordinary advantages in speed over traditional reindeer sleds, reducing trips once taking several days to a few hours.[332] The Skolts quickly applied the snowmobile to the task of reindeer herding, replacing ski-clad herders with snowmobile drivers.[333] Given the high fuel costs of operating snowmobiles and the speeds of which they were capable, reindeer herding quickly devolved into a quick, frenzied process. The months-long, intensive herding practices of the past had produced relatively domesticated reindeer; but the loss of control associated with accelerated herding left the animals increasingly wild and difficult to gather. Further, herding became less of an interaction between herder and reindeer than a scene of frantic capture, as the reindeer were considerably frightened by the nose and smell of the snowmobiles. Due to the lack of domestication, as well as the deleterious effect of the roundups on calves and pregnant females, the Skolts gathered drastically smaller herds following their adoption of the snowmobile.

The snowmobile's effects upon Skolt society were significant and detrimental.[334] The Skolts increasingly became dependent on cash and, in some cases, debt, in order to purchase snowmobiles, fuel and spare parts. Families began to leave herding due to insufficient

330. *Id.* at 28.
331. *Id.* at 39-47.
332. *Id.* at 73.
333. *Id.* at 97-121.
334. *Id.* at 137-63.

resources and loss of control over the reindeer, often migrating to the south or becoming dependent upon government welfare programs. Further, Skolt society gradually experienced stratification. Ownership of the animals became concentrated among a few families, and the once uniform Skolt homes were augmented or replaced by the wealthy few.

This example is not intended to provide a nostalgic lament for the Skolt way of life as it existed thirty years ago, nor a sort of Luddite vision of the effects of technological change. Other factors impacted the shape of the Skolt society.[335] But this example should demonstrate that a view of technology as a neutral tool is too narrow. Inventions such as the snowmobile present implicit values, beyond their technological sphere, which are susceptible to evaluation.

Another example of the non-neutrality of technology concerns the works of the well-known civil engineer Robert Moses.[336] Among his many public projects were the parkways on Long Island, New York, which are marked by conspicuously low overpasses. Motivated by racial and social bias, Moses wished to keep the poor and racial minorities off the parkways, leaving them for the affluent owners of automobiles. He therefore designed the overpasses so that buses would be too tall to pass beneath them. Although Moses has long since passed on, his roads continue to shape life in New York, and stand as well as a monument to social inequality. Moses is hardly unique in designing cityscapes with social concerns in mind. Instead he reflects a tradition established by numerous other engineers, architects and city planners. Many would be surprised to learn that the lovely, broad avenues of Paris were designed to quell street fighting, or that American university officials in the 1970's requested that campuses feature broad plazas in order to restrain student demonstrations.[337] Similarly, among Congress' motivations in promulgating the Americans with Disabilities Act[338] was a recognition of the countless ways in which buildings, sidewalks, public

335. *Id.* at 9.

336. This example is drawn from Langdon Winner, *Do artifacts have politics?*, *in* THE SOCIAL SHAPING OF TECHNOLOGY 26, 28-31 (Donald MacKenzie & Judy Wajcman eds., 1985) [hereinafter THE SOCIAL SHAPING OF TECHNOLOGY]. *See also* ROBERT A. CARO, THE POWER BROKER: ROBERT MOSES AND THE FALL OF NEW YORK (1974).

337. Winner, *supra* note 336, at 29.

338. Americans with Disabilities Act of 1990, Pub. L. No. 101-336, 104 Stat. 327 (codified at 42 U.S.C.A. §§ 12101-12213 (West Supp. 1991)).

transportation and other structures systematically discriminate against handicapped people.[339]

A final example of a non-neutral, value-laden technological advance is factory mechanization. Numerous studies have concluded that factory owners have encouraged research and development of technologies at least in part to increase management control over the workforce.[340]

The cultural effects of the snowmobile, calculated urban planning, and factory mechanization suggest that Friedrich Nietzsche's comments concerning the pursuit of science are particularly well applied to patentable technology:

> During the last centuries science has been promoted, partly because it was by means of science that one hoped to understand God's goodness and wisdom best—this was the plain motive of the great Englishmen (like Newton); partly because one believed in the absolute utility of knowledge, and especially in the most intimate association of morality, knowledge, and happiness—this was the main motive of the great Frenchmen (like Voltaire); partly because one thought that in science one possessed and loved something unselfish, harmless, self-sufficient, and truly innocent, in which man's evil impulses had no part whatever—the main motive of Spinoza who felt divine when attaining knowledge—in sum, owing to three errors.[341]

Technology should not be considered a neutral force. It possess its own values, which we can evaluate and compare with our own. As Langdon Winner notes, "[i]f our moral and political language for evaluating technology includes only categories having to do with tools and uses, if it does not include attention to the meaning of the designs and arrangements of our artifacts, then we will be blinded to much that is intellectually and practically crucial."[342] To the extent that patent law in general, and the pioneer invention doctrine in particular, rely upon a belief in technological neutrality, they rest upon a particularly assailable foundation.

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339. *See, e.g.*, Scott S. Moore, *The Americans with Disabilities Act Title III—The "New" Building Code*, 71 NEB. L. REV. 1145 (1992); Karen E. Field, *The Americans with Disabilities Act "Readily Achievable" Requirement for Barrier Removal: A Proposal for the Allocation of Responsibility between Landlord and Tenant*, 15 CARDOZO L. REV. 569 (1991); Bonnie Tucker, *The Americans with Disabilities Act: An Overview*, 1989 U. ILL. L. REV. 923.

340. *E.g.*, Tine Bruland, *Industrial Conflict as a Source of Technical Innovation: The Development of the Automatic Spinning Mule*, *in* THE SOCIAL SHAPING OF TECHNOLOGY, *supra* note 336, at 84-90.

341. NIETZSCHE, *supra* note 247 at 105-06 (footnote omitted).

342. Winner, *supra* note 336, at 30.

## C. The Case Against Technological Inevitability

This Article cannot yet conclude its analysis of the foundations of the reward rationale of the pioneer invention doctrine, having reasoned that the patent law may possess an alternative technological value, inevitability.[343] Considerable anthropological evidence confirms a contrasting view: far from invariably adopting technology, societies are selective in choosing new technologies.[344] This Article first considers the nineteenth century Opium War between China and Great Britain.

At least until the fifteenth century, China was the technological equal of, if not superior to, the European powers. Many technologies considered fundamental to the rise of modern Europe—gunpowder, paper-making, printing and the magnetic compass—in fact owe their origins to Chinese inventors.[345] By the sixteenth century, however, the technological balance had swung to Renaissance Europe. While technological advance continued at a breakneck pace in the West, such development in China proceeded more gradually or ceased. The technological disparity between Europe and China was highlighted in the First Anglo-Sino Conflict, better known as the Opium War.

By the close of the eighteenth century, Chinese society had developed a drug problem: in return for Chinese tea, the Chinese imported opium from the British. The British East India Company grew opium—a commodity Chinese consumers could not obtain domestically—on its Bengalese lands.[346] As ever greater numbers of Chinese became addicted to opium, a lively drug trade developed. Strict control of foreign commerce by Chinese officials resulted in an impressive amount of smuggling.[347]

Determined to vindicate its own authority and limit the spread of opium addiction, the ruling Manchu regime heightened enforcement of prohibitions on opium trade that had been promulgated as early as 1729.[348] By 1839, vigorous enforcement efforts included seizure of opium and detention of British importers.[349]

Of course, naval strength was the font of British power. China, a land empire with few coastal cities, was therefore extremely

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343. *See supra* notes 203-220 and accompanying text.
344. *See* BASALLA, *supra* note 8, at 186-87.
345. PACEY, *supra* note 240, at 59, 87 and 189.
346. MAURICE COLLIS, FOREIGN MUD 63 (1946).
347. P.C. KUO, A CRITICAL STUDY OF THE FIRST ANGLO-CHINESE WAR 29-33 (1935).
348. *Id.* at 28-29, 63.
349. *Id.* at 98-111.

resistant to British military coercion. The inability of British ships to proceed up inland streams left the British with little choice but to accept the Chinese measures.[350]

The situation changed with the invention of the gunboat, a technology that would at last allow British forces to enter the Chinese interior. The gunboat was a steam-powered iron vessel, specially constructed to operate in shallow waters[351] and initially used for transportation throughout the British Empire.[352] After adding heavy armament and employing the boats to decisive advantage in the Anglo-Burmese War in the mid-1820s, the British considered the gunboat an important military asset.[353]

The arrival of the *Nemesis*, a 184-foot long, 29-foot wide, heavily armed gunboat, at last provided the British a means to negotiate China's inland rivers.[354] In early 1841, a *Nemesis*-led gunboat fleet launched an expedition up the Pearl River towards Canton. Superior in every sense to the more primitive defenses available to the Chinese,[355] the fleet decimated fortresses and warships at will. The next year, after the British fleet sailed up the Yangtze River and entered the Grand Canal, the Chinese government signed a peace treaty highly favorable to the British.[356]

Was the Opium War the result of technological inevitability? Left to face the gunboat, seemingly the certain result of technological advances in steamboats and artillery, the Chinese crumbled, helpless in the face of superior technology which they ultimately adopted themselves. Yet three centuries in the past, a relatively stable Chinese society had developed a core of technologies similar to that of Europe, and in the decades preceding the Opium War, the Chinese had grown quite familiar with the technologies of their European trading partners. Yet, at neither point did Chinese society adopt the supposedly inevitable march of technology. A common explanation is that some deficiency in Chinese society, for example, that the Chinese were overwhelmed by Confucian themes of cultural superiority and viewed Western technology with blinding suspicion,

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350. DANIEL R. HEADRICK, THE TOOLS OF EMPIRE: TECHNOLOGY AND EUROPEAN IMPERIALISM IN THE NINETEENTH CENTURY 45 (1981).

351. *See generally* ANTONY PRESTON & JOHN MAJOR, SEND A GUNBOAT! A STUDY OF THE GUNBOAT AND ITS ROLE IN BRITISH HISTORY 1854 - 1904 (1967).

352. HEADRICK, *supra* note 350, at 21-23.

353. *Id.* at 20-21.

354. *Id.* at 47-48. *See also* PACEY, *supra* note 240, at 143.

355. PACEY, *supra* note 240 at 289.

356. *See* KUO, *supra* note 347, at 160-75.

prevented such advances. Other historians attribute the technological defeat of the Chinese to a Manchu regime ill-suited to deal with foreign policy decisions, or to the pressures and distractions of provincial government.[357]

But another analysis considers the events surrounding the Opium War to represent a contrast between two societies which had made different technological choices. Western society was generally accepting of rapid technological advance, in keeping with the vast intellectual, social and political changes which marked Renaissance and post-Renaissance Europe. In contrast, Chinese society was relatively more stable. The highly trained officials of early nineteenth-century China undoubtedly recognized the superiority of British technologies, particularly in their military applications. Yet they preferred to risk defeat rather than adopt advances which would have fundamentally altered the centuries-old humanistic culture in which they held power.[358]

None of this is to say that the technological impact of gunboats was insignificant. Even historians of the Opium War hesitate, however, to declare technological advance as inevitable, and instead separate gunboat technology from the continuity of the period's cultural, social, temporal and commercial elements.[359] Other examples of societal choices on whether to adopt or retain a particular technology could be cited: the rejection of firearms in seventeenth-century Japan, for example, or the disappearance of the canoe and bow and arrow from ancient Oceania.[360] But lest one think such examples are confined to other places and times, a more contemporary illustration exists: the ill-fated Supersonic Transport (SST), a commercial aircraft designed to fly at supersonic speed.[361]

In the late 1950s, major United States aircraft manufacturers began studying the feasibility of developing an SST. As Great Britain, France and the Soviet Union initiated state-sponsored SST programs, international prestige and leadership in world aviation technology increasingly became relevant to the United States' decision to also fund SST research. Ultimately, the Federal Aviation Agency was given enormous funding and a leadership role in the SST

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357. *See* JAMES M. POLACHEK, THE INNER OPIUM WAR (1992); FREDERIC WAKEMAN, JR., STRANGERS AT THE GATE (1966).

358. BASALLA, *supra* note 8, at 175-76.

359. HEADRICK, *supra* note 350, at 54.

360. BASALLA, *supra* note 8 at 185-89.

361. MEL HORWITCH, CLIPPED WINGS: THE AMERICAN SST CONFLICT 1 (1982).

project. An attitude of extraordinary optimism, fueled by confident predictions, most notably by the Rand Corporation, that commercially feasible SSTs could be developed by about 1970, carried the day.[362] Experts indicated that SST technology was "inevitable"[363] and the next step in a natural progression of technological advancement.[364]

The SST quickly became a topic of intense public concern. Those familiar with supersonic travel recognized that the sonic boom, an explosive, disruptive noise that is a consequence of travel at supersonic speeds, threatened to become part of everyday life near major airports. Studies also indicated that the SST would cause extensive damage to the upper atmosphere, leading to ozone depletion and increased incidence of skin cancer. The economic impact of the SST program further began to loom large in an era of rising fuel prices.[365] Perhaps most importantly, the SST began to symbolize "big government acting in behalf of big business and unbridled technology without regard for the rights and well-being of ordinary citizens."[366] In the face of considerable public protest, the project quickly unraveled. Congress, responding to an extraordinary grassroots lobbying effort, rejected the project in 1971.[367]

A concerned public demonstrated that the SST was not a neutral, necessary or inevitable advance.[368] Careful evaluation of the environmental and economic consequences of the SST had prevailed over the supposedly inescapable forces leading to technological advance. Examples such as the Chinese non-adoption of the gunboat technology and the United States' rejection of SST research funding demonstrate that escalating technological advance is not inevitable. To the extent that patent law accepts the position that technological change is inevitable, its doctrines bear reconsideration.

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362. *Id.* at 7.

363. *Id.* at 8.

364. *Id.* at 21-22.

365. BASALLA, *supra* note 8 at 154-158.

366. *Id.* at 157.

367. *Id.*

368. *See also* PETROSKI, *supra* note 174, at 224 (we should recognize "that we are capable of rearing up and bucking off things that we find too burdensome or that we feel are taking us in the wrong direction."); Allan Mazur, *Public Protests Against Technological Innovations, in* TECHNOLOGY AND SOCIAL CHANGE IN RURAL AREAS 29 (Gene F. Summers ed., 1983).

## IV. A NEW DOCTRINE OF PIONEER INVENTIONS

If we are to benefit from the teachings of either Heidegger or historical experience, we must consider whether patent law can be changed to better reflect an understanding of the scope and impact of technology. Although we cannot, as one Heidegger scholar notes, "legislate a new understanding of being,"[369] we can redirect patent law to better reflect both our understanding of technology and of our own, nontechnological values.

If the pioneer invention doctrine's values of technological neutrality and inevitability are misplaced, then a reformulation of this doctrine rewarding inventions with broad technological protection is in order. An alternate conception of pioneer inventions is straightforward: rather than confining themselves to arguments about the technical aspects of an invention, the courts could also accept arguments on the perceived social consequences of a patent owner's claimed invention. Such an inquiry would allow for nontechnical arguments addressing the pioneer status of an invention. Only if a court judged an invention as a pioneer within this context would it award that patent's claims with generous infringement protection.

The possible factors that bear upon pioneer status are many, and judges should consider all the facts and circumstances surrounding a technology before labeling a particular invention a pioneer. One appropriate factor is the social impact of the invention independent of its advance over the prior art. If an invention broadly changes the way individuals accomplish a technical task, pioneer status may be appropriate even if its progress beyond existing technologies was subtle. The Sixth Circuit's decision in *Deyerle v. Wright Mfg. Co.*[370] provides an apt example of how a new doctrine of pioneer inventions might have achieved a better result. The district court had held that the defendant infringed the claims of the asserted patent, which described a device for fixing fractures during hip surgery. After according the patent's claims a narrow construction as merely disclosing a small improvement in a crowded art, the Court of Appeals overturned the trial court's finding of infringement under the Doctrine of Equivalents. Given the appellate court's acknowledgment that the patented invention was the first to reduce immobilization periods for hip fracture patients from up to six months to as short as

369. Dreyfuss, *supra* note 304, at 310.
370. 496 F.2d 45 (6th Cir. 1974).

one week, however, a finding of pioneer status and a more liberal claim construction may have been more appropriate.

Courts should also turn to more general policy concerns in determining pioneer status. Numerous federal statutes, ranging from the Clean Air Act[371] to the National Mobile Home Construction and Safety Standards Act of 1974,[372] provide a strong indication of current federal regulatory policies and purposes in the area of technology. The compatibility of a given technology with the goals of these statutes, as well as apposite federal regulations—such as the Consumer Product Safety Rules[373] or occupational health and safety standards—should be considered.[374] Stark incongruity with these sources of law appears unlikely to be of recurring significance in pioneer invention cases, however, given the unremarkable fact that a technology is unlikely to be considered a pioneer in any sense of the term if it cannot be legally marketed. More useful may be statements of congressional findings and policy, which can further inform the pioneer invention inquiry.[375]

Another factor for the courts to consider, whether Congress has enacted apposite regulatory legislation or not, is evidence regarding the health, safety, environmental, energy, economic and social influences of a particular invention. The historical examples considered by this Article illustrate more specific elements which might bear upon pioneer status: courts should consider the direction of a particular invention towards a life-saving or lethal purpose; its generation of pollutants or other undesirable byproducts; its consumption of fuels and dependence upon local or external energy sources; its effect upon employment; and its role in the displacement or maintenance of traditional production methods that embody cultural values. These factors would relate to the impact of a given invention upon United States society, which is the ultimate assessment a court should make when determining whether an invention deserves the reward of broad intellectual property protection.

An approach towards pioneer inventions that does not limit itself to strictly technical concerns may present difficulties in

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371. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399 (codified at 42 U.S.C. §§ 7401-7642 (Supp. 1991)).

372. National Mobile Home Construction and Safety Standards Act of 1974, Pub. L. No. 93-383, 88 Stat. 700 (codified at 42 U.S.C. §§ 5401-5426 (1988)).

373. *See* 15 U.S.C. § 2058 (1988).

374. *See* 29 U.S.C. § 655 (1988).

375. *E.g.*, Noise Control Act of 1972, Pub. L. No. 92-574, 86 Stat. 1234, § 2 (codified at 42 U.S.C. § 4901 (1988)).

comparison to the prevailing standard. Courts must be certain not to substitute mere commercial success for a more legitimate policy approach. The remarkable success of a particular invention may be due to elements such as extraordinary marketing efforts and technological fads,[376] which may falsely suggest that an undeserving invention is worthy of an award of broad patent protection.[377] Additionally, the limited patent term may, in some instances, present an inadequate period in which to assess the impact of an invention, despite the fast-moving pace of modern technology.[378] Finally, although laypersons often view new products as a single technological entity, they typically comprise numerous inventions in the sense of patent law. The video cassette recorder, for example, embodied advances in magnetics, materials and electronics, each subject to multiple patents.[379] Out of the many possible patent claims represented in a single product, selection of those eligible for a broad construction as pioneers may prove difficult.

The approach suggested by this Article would certainly cause a shuffling among inventions currently considered pioneers under patent law. When one looks beyond the mere technical cleverness of a particular artifact, many inventions currently considered marginal technical advances may be elevated to pioneer status, while current pioneers could be relegated to a less encompassing claim construction. Thus, inventions such as Kitselman's fence-making machine might well be considered pioneers.[380] Similarly, under this approach courts would be unlikely to make similar declarations regarding inventions such as the machine guns of Lindner or Browning.[381] None of this is to suggest, however, that "there is no new thing under the sun."[382] The view that pioneering inventors have crafted, and will continue to craft revolutionary advances should not be rejected. No doubt exists that some inventions are more important, and more worthy of reward, than others. The important point is that we should pay heed to broader policy concerns when deciding which inventions we should reward with generous technological protection.

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376. *See* BASALLA, *supra* note 8, at 176-85 (discussing atmospheric railways and nuclear propulsion vehicles).

377. *Cf.* Merges, *supra* note 4; Kitch, *supra* note 202, at 330-35.

378. Utility patents currently have a term of 20 years from the date of filing.

379. *See generally* JAMES LARDNER, FAST FORWARD: HOLLYWOOD, THE JAPANESE AND THE ONSLAUGHT OF THE VCR 54-60 (1987).

380. *See supra* notes 150-173 and accompanying text.

381. *See* McClean v. Bradley, 282 F. 1011, 1022 (N.D. Ohio 1922).

382. *Ecclesiastes* 1:9.

This argument is not a novel one; as previously noted, it has existed in some form since the beginning of the United States patent system in the utility requirement. Indeed, the suggestion of this Article may be seen as little more than a robust interpretation of Justice Story's utility standard in the pioneer invention context—limiting broad protection to those inventions "which may be applied to a beneficial use in society, in contradistinction to an invention injurious to the morals, health, or good order of society . . . ."[383] Regrettably, the utility standard has become increasingly attenuated over the years,[384] and, at least according to some commentators, was abolished by the 1966 Supreme Court decision, *Brenner v. Manson*.[385]

But perhaps we should reconsider commentators' interpretations of the *Manson* decision, and the utility requirement as well. In *Manson*, an inventor appealed from the PTO's rejection of his application for its failure to disclose a specific, known usefulness for his invention. His application described a chemical process for producing steroids although it did not provide evidence of a specific use for those steroids, but rather only a hypothetical utility based upon structural similarity to another chemical compound. The Court upheld the PTO rejection, indicating that an invention must produce "specific benefit . . . in currently available form"[386] in order to be eligible for a patent. Writing for the Court, Justice Fortas was distinctly unimpressed with Justice Story's standard, indicating that:

> Justice Story's language sheds little light on our subject. Narrowly read, it does no more than compel us to decide whether the invention in question is "frivolous and insignificant"—a query no easier of application than the one built into the statute. Read more broadly, so as to allow the patenting of any invention not positively harmful to society, it places such a special meaning on the word "useful" that we cannot accept it in the absence of evidence that Congress so intended. There are, after all, many things in this world which may not be considered "useful" but which, nevertheless, are totally without a capacity for harm.[387]

What was not before the Court, however, and is of at least equal importance, is that the patent system must also address inventions that are undoubtedly useful, but toward purposes society cannot

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383. *Note on the Patent Laws*, 3 Wheat. App. 13, 24 (cited in Brenner v. Manson, 383 U.S. 519, 533 (1966)).

384. *See supra* note 34 and accompanying text.

385. 383 U.S. 519 (1966). *See, e.g.*, Salim A. Hasan, *A Call for Reconsideration of the Strict Utility Standard in Chemical Patent Practice*, 9 HIGH TECH. L.J. 245, 251-257 (1994).

386. 383 U.S. at 534-35.

387. *Id.* at 533.

condone. The Court's belittling of Justice Story's standard should be taken within the context of the patentability of chemical processes, rather than within the context of broader concerns for social benefit.[388] Thus, although commentators commonly view the *Manson* decision as amplifying the utility requirement for patentability,[389] such an expansion could only be in a quite narrow sense. Justice Story's standard remains substantially unobserved, as no meaningful test of sound public or patent policy remains in the utility requirement.

The Court of Customs and Patent Appeals, predecessor court to the Federal Circuit, had occasion to consider, at least in passing, the possibility of a patent policy that steps beyond technical considerations in *In re Hartop*.[390] Here, the PTO rejected for want of utility an application claiming an anesthetic that included certain acidic compounds, stating that the inventor had not demonstrated that these compounds were safe for human use. The court overturned the PTO's rejection, indicating that existing anesthetics possessed potentially dangerous side effects and that safety, particularly in the medical arts, was a relative matter. Stating that it "anticipated" arguments regarding congressional purpose with respect to the patent statute, the court went on to provide in dicta that:

> there is no question, but that the public must be protected absolutely against the advertising and sale and other distribution of harmful drugs, medicines, and the like in all situations, including this one if such be the case. We believe that Congress has recognized this problem and has clearly expressed its intent to give statutory authority and responsibility in this area to Federal agencies different than that given to the Patent Office. This is so because the standards established by statute for the advertisement, use, sale or distribution of drugs are quite different than the requirements under the Patent Act for the issuance of a patent. For example, the Federal Trade Commission has been given the responsibility of enforcing the Wheeler-Lea amendments to the Federal Trade Commission Act. Also, the Food and Drug Administration has been given the responsibility of enforcing the Food, Drug, and Cosmetic Act.[391]

This Article raises no objection to the narrow *Hartop* holding that therapeutics, even those with potentially deleterious side

388. *See also In re* Kirk, 376 F.2d 936 (C.C.P.A. 1967); *In re* Joly, 376 F.2d 906, 908 (C.C.P.A. 1967) (claimed chemical compounds do not satisfy utility requirement where only use is as starting material or intermediate as part of a process of making other compounds, and the application does not specify a utility for the end result).

389. *E.g.*, Hasan, *supra* note 385 at 258-260.

390. 311 F.2d 249 (C.C.P.A. 1962).

391. *Id.* at 257-58 (footnotes omitted).

effects, fulfill the utility requirement;[392] it is this dicta that it finds objectionable. The court failed to consider that the statutory utility requirement is sparsely drafted[393] and has, since its initial inclusion in the Patent Act of 1790, been driven from the PTO and the bench. A drafter of the current patent statute indicated that it merely followed existing law on this point.[394] Further, although the court cited apposite regulatory legislation, its holding essentially placed the patent statute at cross purposes with that legislation.[395] Greater effect to congressional purpose may have been given through taking advantage of the utility requirement, rather than avoiding the decision by deferring to the FDA. Nor did the court have an opportunity to consider what the impact of the utility requirement should be in areas where other legislation could not be said to control.

Contemplation of *Manson* and *Hartop*, two cases concerning the utility requirement, leads to the obvious possibility that we should reconsider utility as well. If the pioneer invention doctrine should embrace nontechnical concerns, then a reinvigoration of the utility requirement for patentability, and thus for all inventions, may also seem appropriate.[396] The reinstatement of this requirement leads to certain benefits, given the lengthy delays currently prevailing in patent prosecution. Notoriously overworked examiners must currently consider inventions clearly bereft of positive social worth, and even those which cannot be marketed due to law or regulation. Devotion of scarce examiner hours to such technologies presents a puzzling allocation of resources.

However, several important factors weighing against increases in prosecution efficiency indicate that maybe the current scope of the utility standard should not be expanded. The first factor is technological disclosure, one of the primary goals of a patent system.[397] The technical community is interested in learning about inventions even if their present use does not improve on existing technologies or would not comport with public policy. Later technical

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392. *See also In re* Anthony, 414 F.2d 1383, 1394-95 (C.C.P.A. 1969); *In re* Krimeal, 292 F.2d 948, 953-54 (C.C.P.A. 1961).

393. *See* 35 U.S.C. § 101 (1988) (stating only that a patentable invention must be "useful.").

394. P.J. Federico, *Commentary on the New Patent Act*, 75 J. PAT. & TRADEMARK OFFICE SOC'Y 161, 176 (1993) (reprint) (noting that current statute follows the phrasing of the previous legislation).

395. 311 F.2d at 258.

396. *See supra* notes 180-186 and accompanying text.

397. *See supra* notes 16-17 and accompanying text.

developments or changes in social mores may make an invention far more useful, rendering it environmentally sound or allowing society to accept or neutralize its harmful side effects. Further, inventions with no currently known end uses could serve as a bridge to later, more socially beneficial technological developments.[398] In contrast, concerns over disclosure do not play an independent role in the pioneer invention inquiry. As an inventor has already obtained a patent and is attempting to enforce it, the scope of protection of the claims becomes the primary concern.

A second factor is that an enhanced utility requirement might present considerable difficulties for patent applicants in relation to a purely technological patentability standard. Forecasting is as difficult with respect to technology as it is in other fields, and a requirement that patent applicants explain the possible impact of their inventions may simply present an impossibility. Consider the example of Thomas Edison, who thought his newly invented phonograph would best serve as a dictation machine. He paid far less heed to its use as a medium for music and initially resisted this use as demeaning to the technology.[399] Again, however, arguments about forecasting carry less weight with respect to whether a court should designate a particular invention as a pioneer. By the time infringement litigation has commenced, the ability of patent owners to consider the nontechnological consequences of their inventions should be greatly enhanced.

Other concerns counsel against a broadly focused utility standard. For example, an assessment of an invention's societal impact draws far more from the social sciences than the technological arts in which the corps of PTO examiners received its training. The competence of an examiner to complete this inquiry during an ex parte patent prosecution therefore remains questionable. Extensive safety and performance testing requirements, which are today more typical of regulatory agencies than the PTO, would also be a time-consuming burden during prosecution. Additionally, in the absence of international agreement placing the utility requirement within a nontechnological domain, any lone jurisdiction adopting this approach

398. *See* Manson v. Brenner, 383 U.S. 519, 539 (1966) (Harlan, J., concurring in part and dissenting in part).

399. BASALLA, *supra* note 8, at 139-40.

would impose a particular liability to its domestic applicants in the current era of global patent harmonization.[400]

As even this brief review reveals, whether the utility requirement should also reflect broad social concerns raises thorny issues, implicating both the procedural limits of prosecution and the fundamental purposes of the patent system. Judicial experience with a similarly focused pioneer invention standard would be the best testing ground of the merits of a more broadly oriented patentability determination. If the historical analysis and critical thinking this Article has reviewed endure in this setting, experience should show that the law will enrich our understanding of technology by accepting it within its broadest human context, rather than merely within a narrowly focused celebration of technical skill.

A consideration of the pioneer invention doctrine suggests that the patent law has lost its way in a fundamental sense. The pioneer invention doctrine's moorings are unsteady: if its central premises of technological neutrality and inevitability are upset, then the focus of the patent law's reward structure seems significantly misaligned.

Few would doubt we live in an age uniquely marked by its technology. Nor does much debate persist over the role of patent law as one of the shapers of our nation's central technology policies. Indeed, the patent system is likely the technological program most accessible to each citizen, a remarkable trait in a society where crucial technological decisions are often claimed to fall to a ruling technocratic elite.[401] Astonishingly, however, all meaningful dialogue about the value of technology on a level beyond the technical has been stripped from patent law.

An alternative vision of the patent system suggests a radical new role for the PTO, the courts, or the Congress. Patent law could, and perhaps should, serve as a clear vehicle for technological policy making. We would be wise to question patent grants for inventions such as handguns, machines for processing chewing tobacco, and ozone-

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400. Article 4quater of the Paris Convention for the Protection of Industrial Property imposes one potential difficulty. It requires that:

> The grant of a patent shall not be refused and a patent shall not be invalidated on the ground that the sale of the patented product or of a product obtained by means of a patented process is subject to restrictions or limitations resulting from the domestic law.

Paris Convention for the Protection of Industrial Property, March 20, 1883, as revised on July 14, 1967. For general information on patent harmonization, *see* HAROLD C. WEGNER, PATENT HARMONIZATION (1993).

401. *See* FLORMAN, *supra* note 203, at 50-52 (noting such claims).

depleting spray canisters. At the least, courts should consider the social impact of patented technologies when they decide to elevate those technologies to pioneer status. Courts should also more broadly weigh the extraordinary problems of technological description underlying any written summary of an invention when reaching patent infringement decisions.

Hopefully, this Article has struck the reader as something more than a romantic reaction to the current literature on the pioneer invention problem, draped as these analyses are in the quantitative language of economics.[402] This Article has purposefully avoided an economic orientation, however, out of a belief that economic theories are particularly unsuited to determining how we should form our world.[403] It has instead argued that the patent law should appreciate and reflect its own role in the shaping of society by technology. Considerations of technology as a philosophical concern can assist in this process of technological evaluation, which ought to be central to our patent system, with the potential to invigorate patent law scholarship and perhaps the regime of patents itself.

402. *See supra* notes 11-13 and accompanying text.

403. *See* Priest, *supra* note 14, at 24 ("Personally, I believe there is little hope that economic analysis can resolve the question of the appropriate scope of the protection of intellectual property. . . . [T]he influence of the economist on the law of intellectual property will always be limited. The lawyer must look to other sources for guidance.").

# ARTICLE

# THE EUROPEAN UNION'S PROPOSED DIRECTIVE FOR THE LEGAL PROTECTION OF DATABASES: A NEW THREAT TO THE FREE FLOW OF INFORMATION

DEBRA B. ROSLER †

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## I. INTRODUCTION

The electronic information industry emerged two decades ago as American businesses sought to recoup their investment in databases by

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selling the information they had originally collected for their own internal use.[1] Today, the electronic information industry–including information retrieval software, delivery services and electronic databases–is one of the fastest growing sectors of the economy.[2] Databases contain a wide range of information, including demographic, bibliographic, medical, technological, news, financial, and travel-related material.[3] The United States currently dominates this market.[4] The information industry, however, is rapidly expanding around the globe through the increasing reliance on cross-border flows of information and the expansion of complex information delivery systems.[5]

The global rise in the use of databases challenges existing legal systems worldwide by creating tensions between presently applicable laws and important public policy concerns. Information stored in databases is often critical to medical treatment, scientific research, education, and other areas which contribute to the advancement of society. In these areas, free use of information is vital. At the same time, the creation of databases is expensive, labor-intensive and time-consuming. Such costs demand some form of protection from copying to provide incentive for investment in database creation.

Legal protection for database contents is of paramount importance because of the ease and low-cost with which digitally-stored data can be pirated.[6] If data piracy remains penalty-free, second-comers will have an immense free-rider advantage. The inherent vulnerability of electronically-stored databases thus amplifies the need for applicable laws to achieve two contradictory goals: providing economic incentives that will encourage investment in database production, while simultaneously preserving the free flow of information necessary to foster

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1. One of the first commercially-marketed databases was Knight-Ridder's Dialog Information Services, which evolved from a government contract with Lockheed Aerospace Company to catalog NASA's files. Note, *Information Liability: New Interpretations for the Electronic Age*, 11 COMPUTER L.J. 482, 486-87 (1992).

2. 161 STANDARD & POOR'S, INDUSTRY SURVEYS 10/7/1993 C107; DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994.

3. *Id.*

4. 1991 Report on the Impact Program: Main Events and Developments in the Electronic Information Services Market, COM(93)156 final, at 1a, 2, 44 [hereinafter 1991 Impact Report].

5. 161 STANDARD & POOR'S, INDUSTRY SURVEYS 10/7/1993 C75; Christopher Millard, *Comments on the Proposed EC Database Directive*, 6 WORLD INTELL. PROP. REP. 76 (1992); Amended Proposal for a Council Directive on the Legal Protection of Databases, COM(93) 464 final-SYN 393 (1993), Preamble no. 9 [hereinafter Amended Directive].

6. Amended Directive, *supra* note 5, Preamble no. 6; PAUL GOLDSTEIN, COPYRIGHT: PRINCIPLES, LAW AND PRACTICES, § 1.2 (1989 and Supp. 1991); Paul Durdick, *Ancient Debate, New Technology: The European Community Moves to Protect Computer Databases*, 12 B.U. INT'L L.J. 153 (1994).

social advancement. Such laws must strike a delicate balance between access and protection.

The European Union (E.U.) is currently trying to address the complex issues surrounding the rising use of electronic databases. Unsatisfied with the protection currently offered to databases, the European Commission has proposed a Directive on the Legal Protection of Databases (the Directive). The Directive would supplement the current level of protection with a separate sui generis right against unauthorized use of the actual contents of electronic and paper-based databases.[7]

This new right would apply solely to database contents that are not protected under copyright, without interfering with the rights accorded to compilations under the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention).[8] The Directive incorporates the copyright protection of the Berne Convention, the primary multilateral copyright treaty, to which all of the member states of the European Union are signatories. Berne solely protects elements of databases that contain some level of originality, a policy consistent with U.S. copyright laws.[9]

The Directive grew out of the Information Market Policy Actions Program, the E.U. policy framework for building a common information technology system.[10] This program specifically addresses many critical issues facing the E.U. in its efforts to enter the information marketplace, including the strengthening of intellectual property laws, and the protection of new technology, international trade and the European economy.[11] The European Commission drafted the Directive with the apparent intention of addressing a wide range of issues in its plan for stimulating the growth of the E.U.'s faltering database industry. This scattered approach has resulted in legislation based upon a patchwork of policy.

This Article examines the main provisions of the Directive and argues against its adoption by the European Union. The article discusses problems that would arise from the implementation of the Database Directive, and notes the international reactions of the information industry to the proposed Directive.

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7. 1991 O.J. (C 53) 4; *see also* IP (95) 572 (European Union press release issued regarding the formal adoption of an amended draft of the Database Directive by the Council of Ministers, which would protect both electronic and paper-based databases. This draft is before the European Commission under the co-decision process.); *see also infra* note 20 (discussing the co-decision procedure).

8. Berne Convention for the Protection of Literary and Artistic Works (1971) [hereinafter Berne Convention].

9. Copyright Act of 1976, 17 U.S.C. §§ 101, 102 (1976).

10. 1991 Impact Report, *supra* note 4, at ii.

11. *See infra* notes 236-38 and accompanying text.

In addition, the Article examines the many roles the European Commission planned for the Directive to play, and concludes that the Directive will ultimately fail both as an international trade mechanism and as an E.U. economic policy.

Part II begins with a review of legislative history of the Directive, including a brief overview of the database industries in the European Union and the United States, and an examination of Europe's regulatory goals for new technology. Part III provides a detailed discussion of the main provisions of the proposal, including an examination of the structure and scope of the bi-level protection offered by the Directive–through copyright and new sui generis rights. Part III also reviews the repeated attempts by E.U. legislative bodies to clarify ambiguous terms in the Directive, attempts which have failed to eliminate fundamental flaws in the language of the proposal and address many concerns voiced by industry members.

Parts IV, V, and VI look at the Directive in its global context. First, Part IV discusses the potential impact of the Directive upon database producers in the United States. The European Commission drafted the Database Directive to include reciprocity provisions aimed specifically at boosting the production of databases in the E.U. and protecting European databases against worldwide competition. These reciprocity provisions limit the grant of protection under the Directive to database producers with their principal place of business in the E.U. and to producers in countries which grant similar legal protection. Consequently, most database producers in the United States will not be protected under the Directive, because U.S. laws lack reciprocal protection of database content. The E.U.'s quest for market share has evidently targeted the United States, which accounts for the vast majority of the worldwide production of databases.

Part V notes international reactions to the Directive by industry members and trade associations, including potential governmental and industrial reactions to its enactment in the United States. Part VI of the article analyzes the policy problems arising from the numerous roles the E.U. intends for the Directive to play. This Part argues that the long-term effects of the Directive would be extremely harmful to the E.U.'s culture and economy. As a pioneer in the search for a solution to the global problem of protecting databases from piracy, the E.U. has drafted legislation that merits serious attention. However, in its current form, the Directive would do more harm than good, primarily because it completely ignores the harm to society that would result from the stifling of the free-flow of information. Laws in the United States that encourage the free flow of information have not prevented the United States from dominating the global information industry. The Article concludes by urging the E.U. to address economic problems and international trade

issues by more direct means, rather than through the reckless grant of intellectual property protection.

## II. IMPETUS FOR THE DIRECTIVE: LEGISLATIVE HISTORY

Databases contain a wide range of information indispensable to numerous industries, including marketing, finance, credit, news and tourism.[12] Companies increasingly depend on electronically-stored information, which reaches end-users in many different forms, including audiotext telephone services, on-line databases, and compact disk read-only memory (CD-ROM).[13] A large percentage of electronically-stored databases contain raw data, often organized in alphabetical or chronological order.[14]

Spurred by the expansion of information delivery systems, the electronic information technology sector has been growing at a very rapid rate, especially in the United States, [15] which has been both the largest producer and consumer of electronic information technology.[16] The United States maintains many advantages in this industry, including first entry, an essentially monolingual market, and economies of scale from years of consolidation and industry experience.[17] By contrast, Europe faces many obstacles to developing a strong, unified information technology system. Above all, the E.U. is hampered by linguistic fragmentation of its market and onerous labor laws. Europe holds a 30 percent share of the world's database production, but its industry maintains a much slower growth rate than that of the United States.[18] Database publishers in the United States outnumber their European counterparts by a ratio of two to one; for business-related databases, the ratio increases to three to one.[19] In addition, the European industry is

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12. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994, at 25-2.

13. *Id.*

14. *Id.*

15. *Id.* at 25-1; 160 STANDARD & POOR'S, INDUSTRY SURVEYS 12/31/92 at C75-C77.

16. Worldwide revenues from the information technology market (information hardware, software and services) were $360 billion in 1992. 161 STANDARD & POOR'S, INDUSTRY SURVEYS 10/7/1993 at C107. Revenues from U.S. electronic information services alone grew 16% in 1993 to about $13.6 billion, and 1994 estimates are $15.6 billion. The U.S. dominated database production in 1993, when 2,221 companies produced about 5,210 databases. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994 at 25-1, 25-2.

17. *See infra* note 20.

18. News services dominate the E.U. information industry, while technological and bibliographic databases are its major growth sectors, as they remain unhindered by the language barriers prevalent in the European Union. 1991 Impact Report, *supra* note 4, at ii.

19. Vincent Parajon Collada, *Information Supermarket: Electronic Services Across Europe*, XIII MAGAZINE, July 1991, at 4. The database industry produced revenues of $3.5 billion in western Europe in 1992. *Fighting International Piracy of Data Bases: European Commission Proposes to Harmonize Legal Protection in the Community*, RAPID, Jan. 29, 1992.

highly concentrated in one country, Great Britain, which holds about a 65 percent share of Europe's database revenues.[20]

The disparity in database industry market share among nations within the E.U. is reflected in the disparity among its intellectual property regimes. The E.U. does not have a unified system for protection of electronic databases.[21] While the copyright laws of most member states protect the formats of databases,[22] only a handful of these countries protect the database contents themselves.[23] The Directive would harmonize the laws of the member countries under provisions in the Treaty Establishing the European Economic Community (EEC Treaty)[24] that enable E.U. governing bodies to harmonize existing member state laws and enact commercial regulations and trade restrictions deemed necessary to protect European intellectual property.[25]

As mandated by the EEC Treaty, the European Council of Ministers (Council of Ministers) follows the development of new technology very closely.[26] The Council of Ministers has made a concerted effort to foster the growth of the information services market. In 1984, the Council of Ministers instituted a preliminary plan to build a common information services market,[27] and in 1988, it enacted the Information Market Policy Actions Program (Impact), directed by Director General XIII (DG-XIII), the European Commission's division on electronics, telecommunications, and technology.[28] Impact was established to promote the growth of the information services industry and to remove legal and administrative

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20. The next largest market shares belong to France and Germany, *Commission to Extend Term of Protection of Databases*, REUTERS EUR. COMMUNITY REP., June 22, 1993; Commission of the European Communities, Directorate-General for Economic and Financial Affairs, 1993 Annual Economic Report of the European Economy 86-87 (1993) (followed by Japan and Canada); DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994, at 25-3.

21. *EP Approves the Strengthening of the Directive on the Legal Protection of Databases*, REUTERS AGENCE EUROPE, June 25, 1993.

22. Berne Convention, *supra* note 8, art. 2(5); *see also infra* note 62 and accompanying text.

23. *See* text accompanying *infra* notes 45-46.

24. TREATY ESTABLISHING THE EUROPEAN ECONOMIC COMMUNITY, art. 57(2) [hereinafter EEC TREATY]; *see also infra* notes 233-35 and accompanying text; Durdick, *supra* note 6, at 153.

25. EEC TREATY, *supra* note 24, at art. 36.

26. Amended Directive, *supra* note 5, at Preamble no. 1; EEC TREATY, *supra* note 24, art. 36.

27. Council Decision 84/567, 1984 O.J. (L 314) 19. The Council also established ESPRIT, the European Strategic Program for R&D in Information Technology, and, one year later, the RACE initiative (R&D in Advanced Communications Technologies for Europe), a program to spur research and development in broadband communications and facilitate the establishment of an integrated broad band fiber optic communications network across the European Union. Margaret Sharp & Keith Pavitt, *Technology Policy in the 1990s: Old Trends and New Realities*, 31 J. OF COMMON MKT. STUD. 129, 138-39, tbl. 1 (1993).

28. Council Decision 88/524, 1988 O.J. (L 288).

barriers to its development.[29] In 1991, Impact's research arm–the Information Market Observatory–called for heightened attention to this market by reporting that "the commercial value of timely and relevant information" necessitated a stronger, more user-friendly information services industry.[30] That same year, the Council of Ministers extended Impact for four more years as Impact 2,[31] with a primary agenda that included intellectual property protection for information technology.[32]

In the late 1980's, the European Commission (the Commission) began conducting studies and hearings seeking industry opinion on whether new technologies required additional intellectual property protection. The Commission published a report of its findings in a 1988 study entitled the Green Paper on Copyright and the Challenge of Technology: Copyright Issues Requiring Immediate Action,[33] which argued that the E.U. needed to overcome "obstacles to the free movement of information."[34] In April 1990, the Commission held another round of hearings and published a follow-up report to the Green Paper.[35] At these hearings, the Commission invited comments regarding the effectiveness of the legal protection of databases. The Commission specifically inquired whether the formats of electronic databases should retain copyright protection, and whether the contents of such databases should be protected by copyright or sui generis legislation.[36]

A majority of the electronic information industry representatives who testified at the Commission hearings on database protection preferred enhanced copyright protection for databases over a grant of sui generis protection. Widespread opposition arose against sui generis

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29. Information and Communications Technologies in Europe, Commission of the European Communities, Directorate-General XIII on Telecommunications, Information Industries and Innovation 66-8 (1991).

30. COM(93)156 final at ii, 1. Prior reports on the development of the information services market include SEC (90)1788 final (report on 1988-89), and SEC (92)1536 final (report on 1989-1990).

31. Council Decision 91/691 1991 O.J. (L377).

32. *Id.*; *see also* Collada, *supra* note 19, at 5.

33. COM(88)172 final. The Commission is comprised of individuals from the member countries who address 23 policy areas, without separately representing the interests of their own countries.

34. Council Decision 88/524, *supra* note 28.

35. Working Program of the Commission in the Field of Copyright and Neighboring Rights, COM(90)584 final. Three directives emerged from these studies, including the Council Directive on the Legal Protection of Computer Programs; the Council Directive on Rental Right and Lending Right and on certain Rights relating to Copyright in the Field of Intellectual Property; and the Council Directive on the Legal Protection of Mask Works. More recent technology-oriented directives address biotechnology, including the availability of patents for living matter and fostering the biotechnology market; E.U.-wide trademarks and patents; and copyright and neighboring rights for satellite broadcasting and cable retransmission. *Completing the Internal Market*, INFO-92, Feb. 13, 1989.

36. Millard, *supra* note 5, at 76; *see also supra* notes 22 and 28.

legislation. Despite such opposition, in 1992, the Commission began crafting a proposal for the legal protection of electronic databases to grant both copyright and sui generis protection for electronic databases.[37] The Commission intended the proposed directive to protect the copyrightable format elements of databases under the primary international copyright agreement, the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention),[38] as well as create a new sui generis protection against the unauthorized use of the contents of databases. The result was the Directive.

The Directive underwent several revisions after the Commission issued its first version. On November 24, 1992, the Economic and Social Committee (ECOSOC)–an intermediate Commission subcommittee which examines proposals and issues opinions with suggestions and comments[39]–unanimously approved the Directive with many suggested amendments. On June 23, 1993, the European Parliament reviewed the Directive and suggested another thirty-seven amendments.[40] Finally, on October 4, 1993, the Commission released its latest draft of the Directive, adding thirty-two of the Parliament's amendments.[41] The Council of Ministers formally adopted an amended version of the Directive as a Common Position on June 29, 1995, and sent the amended version of the Directive (text unavailable at the date of publication) back to the European Parliament for its second reading under the co-decision procedure.[42] The Parliamentary review of the Database Directive should have been the final stage in the legislative process,[43] after which each E.U.

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37. COM(92)24 final-SYN 393, 1992 O.J. (C 156) 4 [hereinafter Draft Directive].

38. Berne Convention, *supra* note 8.

39. 1993 O.J. at C19.

40. Amendments to the Proposal for a Council Directive on the Legal Protection of Databases, 1993 O.J. (A 183) 10 [hereinafter Parliament Amendments]. The Parliament returned the Directive to the Commission for substantive revisions and changes to clarify ambiguous language under procedures codified at Articles 57(2), 66, 100a, and 149(3) of the EEC Treaty, 1992 O.J. (C 271); *see also Commission to Extend Term of Protection of Databases*, REUTERS EUR COMMUNITY REP., June 22, 1993; *The EP Approves the Strengthening of the Commission Proposal on the Legal Protection of Databases*, AGENCE EUROPE, EC, June 25, 1993.

41. Amended Directive, *supra* note 5.

42. *See* IP(95)572 (European Union press release issued regarding the formal adoption of an amended draft of the Database Directive by the Council of Ministers, which would protect both electronic and paper-based databases. This draft is before the European Commission under the co-decision procedures of the Council and Parliament.)

43. Certain other E.U. groups are currently meeting to discuss the Directive and report their opinions to the Council. The Council's working group on intellectual property issues recently met to discuss the Directive, where the representatives voiced varying and often contradictory positions on the terms of the Directive. *Data Protection EU Council Examines Sui Generis Rights*, TECH EUROPE, Mar. 1, 1995. The European Union's Internal Market Council, which meets regularly in Europe to discuss internal market issues, has

member country was obligated to enact the Directive as part of its national laws within two years.[44] More than three years after its initial introduction, however, the Database Directive still awaits final legislative approval.

## III. THE MAIN PROVISIONS OF THE DATABASE DIRECTIVE

### A. Rights Granted by the Directive

#### 1. *SUBJECT MATTER*

The Directive is modeled after a provision in the Danish Copyright Act,[45] which grants protection, for a period of ten years, to the contents of both printed and electronically-stored databases:

> Catalogues, tables and similar productions in which a great number of items of information have been compiled, as well as programmes, may not be reproduced without the consent of the producer until ten years have elapsed from the year in which the production was published. . . . If productions of the said nature or parts thereof are subject to copyright or other protection, such may also be applied for.[46]

Unlike its Danish model, the original version of the Directive only protected electronic databases. The Commission targeted electronically-stored information because of its rising importance to the E.U.'s economic growth and its heightened vulnerability to piracy.[47] The Preamble of the Directive states, "the increasing use of digital recording technology exposes the database maker to the risk that the contents of his database may be downloaded and rearranged electronically without his authorization to produce a database of identical content but which does not infringe any copyright in the arrangement of his database."[48] The original Directive's limited scope also arose from the Commission's concern that the electronic information industry was disadvantaged by the well-established print publishing industry that perpetuates "a relatively underdeveloped market for electronic information" in the European Union.[49]

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announced that the Database Directive is also on its agenda for discussion for its meeting on June 6, 1995. *Id.*; *see also* REUTERS EUR. COMMUNITY REP. Nov. 29, 1994.

44. Amended Directive, *supra* note 5, at art. 16(1).

45. Danish Copyright Act §49, reprinted in EUROPEAN UPDATE, INTELLECTUAL PROPERTY, Mar. 3, 1994.

46. *Id.*

47. Amended Directive, *supra* note 5, at Preamble, nos. 6 & 27, art. 2(2).

48. Draft Directive, *supra* note 37, at Preamble, § 27.

49. 1991 Impact Report, *supra* note 4, at 8.

The definition of "database" in the Directive has evolved considerably throughout the rounds of amendments, to the current broad definition which includes both electronic and paper-based databases.[50] The definition excludes from its scope "any computer program used in the making or operation of the database,"[51] such as software used to access a database, which is separately protectable under the Council Directive on the Legal Protection of Computer Programs.[52]

The Directive also protects "the materials necessary for the operation of the database, such as its thesaurus, index, or system for obtaining or presenting information."[53] This definition is broad and ambiguous and could even be interpreted to include the on-line learning tools that accompany many databases to facilitate their use. Moreover, the phrase does not explicitly limit the media in which these materials may be produced and still receive protection. Thus, the Directive could conceivably be interpreted to protect *printed* manuals, indices, thesauruses, and other user aids. Unfortunately, further clarification of this ambiguous definition is unlikely at this final stage in the legislative process, leaving the scope of protection open to interpretation.

### 2. *COPYRIGHT AND SUI GENERIS RIGHTS AND REMEDIES*

The Directive provides bi-level protection to databases. Copyright protection contained in Article 6 of the Directive grants a database owner the exclusive rights of reproduction, translation, adaptation, arrangement, and alteration of the database.[54] Article 6 also protects a database owner's right to distribute the database to the public, including rental rights, and to provide services related to the authorized use of the database.[55]

The Directive's copyright protection extends to databases produced in the E.U. and in non-E.U. countries "who fulfill the requirements laid down in national legislation or international agreements on copyright applicable to literary works."[56]

The Directive incorporates by reference copyright protection provided by the Berne Convention, other international agreements, and the national legislation of other countries that protect databases "as

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50. *See, e.g.*, Amended Directive, *supra* note 5, at art. 1(1) (containing prior definition of database, which was limited to electronically-stored and accessed information). Collections of factual data are unprotectable subject matter under U.S. copyright law, as discussed *infra*.

51. *Id.*

52. 1991 O.J. (L 122) 42.

53. *Id.* at art. 1(1).

54. *Id.* at art. 6.

55. *Id.* at art. 5(a)-(e).

56. *Id.* at art. 4.

collections within the meaning of Article 2(5) of the Berne Convention."[57] The Berne Convention grants a minimum of fifty years of copyright protection to the elements of a database that reflect "intellectual creation,"[58] and denies protection to "news of the day or to miscellaneous facts having the character of mere items of press information."[59] The Berne provision defining the protectable elements of a database reads:

> Collections of literary or artistic works such as encyclopedias and anthologies which, by reason of the selection and arrangement of their contents, constitute intellectual creations shall be protected as such, without prejudice to the copyright in each of the works forming part of such collections.[60]

The Directive does not extend *copyright* protection to the factual contents of databases,[61] just as the Berne Convention denies protection to "news of the day" or to miscellaneous "facts."[62] The Directive separately protects database contents through sui generis rights that are the source of most of the controversy over the Directive. These sui generis rights do not extend protection to contents copyrightable in themselves, such as poems in an on-line literature anthology.[63] They solely protect database contents that are uncopyrightable.[64] Thus, the sui generis rights exist separately from Berne's copyright protection, and are "not to be considered in any way as extensions of copyright protection to mere facts or data."[65]

The Directive grants database owners the "right to prevent *unauthorized* extraction" of the contents of their databases.[66] The earlier versions of the Directive initially granted a "right to prevent *unfair* extraction of the contents of a database."[67] The provision was later changed by the Commission, which decided that the question of whether a database user is authorized to access information is easier to determine

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57. *Id.* at art. 4.

58. Berne Convention, *supra* note 8, at art. 7(1). Article 7(6) allows signatory countries to extend protection beyond the terms provided by Article 7, and the term under Berne will soon be extended to 70 years.

59. *Id.* at art. 2(8).

60. *Id.* at art. 2(5).

61. Amended Directive, *supra* note 5, at art. 2(4).

62. Berne Convention, *supra* note 8, at art. 2(8).

63. Amended Directive, *supra* note 5, at art. 5(1). If additional protection is also available under other laws, that protection would not be affected by the Database Directive. Article 15(1) of the Amended Proposal states that the Directive "shall be without prejudice to . . . legal provisions such as patent rights, trade marks, design rights, unfair competition, trade secrets, confidentiality, data protection and privacy, and the law of contract applicable to the database itself or to its contents." *Id.* at art 15(1).

64. *Id.*

65. *Id.* at Preamble, no. 29.

66. *Id.* at art. 10 (emphasis added).

67. *Id.* at art. 1(2) (emphasis added).

than whether a certain use is unfair. This charge fortunately obviated the need for any judicial interpretation of "fairness."

The remedies that database owners may pursue against database users who infringe upon their sui generis rights remain unclear even in these final stages of the Directive. Article 14 of the Directive allows member states to provide whatever "appropriate remedies" they choose.[68] Therefore, violators may receive widely varying penalties, depending upon such factors as the jurisdiction in which the owner sues the infringer, the jurisdiction where the sui generis rights attached, the jurisdiction where the information was collected, the domicile of the infringer, and other yet unknown factors left to be determined by the courts if the Directive is enacted.

### 3. *OWNERSHIP AND AUTHORSHIP*

The initial draft of the Directive contained definitions of the ownership and authorship of a database that were highly ambiguous and generated much confusion in the database industry. These early definitions extended the exclusive rights in Article 6 to an author of a database, but not the owner of the database.[69] The latest draft of the proposal establishes that the "owner" of the database is also the holder of the exclusive rights in the database.[70] The "owner" can now be the holder of a copyright in the database format, a database producer holding sui generis rights in the database contents, or an author's grantee of any extraction rights.[71] Thus, under the work made for hire terms in Article 3(4), a company producing a database is both the owner of the database created by its employees and the holder of the exclusive rights granted in the Directive.[72]

In the draft of the Directive that went before the Council of Ministers, the Commission also changed the definition of ownership to accord with the Berne Convention grant of "moral rights" to "authors" of the copyrightable elements of a database.[73] Berne grants certain non-economic moral rights to natural authors of artistic works.[74] These rights include the right of paternity, the artist's right to be recognized as the creator of the work, and the right of integrity, the artist's right to protect the work from distortion.[75] Thus, the owner of a database completely

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68. *Id.* at art. 14.
69. Draft Directive, *supra* note 37, at art. 5.
70. Amended Directive, *supra* note 5, at art. 1(2).
71. *Id.*
72. *Id.* at art. 3(4).
73. *Id.* at Preamble, no. 22; Berne Convention, art. 2.
74. Berne Convention, *supra* note 8, at art. $6^{bis}$.
75. *Id.*

lacking in copyrightable elements (the contents, or the coordination, selection, or arrangement of the contents) will obtain no moral rights in the work.[76]

### 4. *THE TERM OF PROTECTION*

The Directive establishes bi-level terms of protection for databases. The copyrightable elements of a database would receive the same term of protection granted to literary works under the Berne Convention–a minimum of fifty years.[77] A fresh term of copyright protection would begin each time any "substantial changes to the selection or arrangement of the contents are made to the database."[78] If a database owner made a "substantial change" in a database's copyrightable elements, the database would be considered to be a new database or new edition of the database, separately protectable from the moment of its creation. In that situation, the term of protection already accorded the original remains unchanged.[79]

The sui generis protection, on the other hand, has a much shorter term. The Commission initially proposed a ten-year term of sui generis protection[80] and received widespread criticism, despite the Commission's defense of the duration as a compromise between the need for database producers to recoup their investments and the need to disseminate information.[81] Several technology policy experts argued for "strict time limits . . . deliberately cut back over . . . a five year period."[82] On the other side of the spectrum, ECOSOC–an intermediate E.U. governing body that reviewed the Directive–remarked that the term was randomly chosen and inadequate, and recommended that the term mirror that of copyright protection for equal weight and effect.[83]

In March 1993, the European Parliament conducted hearings on the initial draft of the Directive, where industry members lobbied for a longer term of protection.[84] The speakers also testified that the Commission should draft more specific provisions regarding the effects that revisions and additions to a database would have on the start date of a term of

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76. *Id.* at art. 2.

77. *Id.* at art. 9(1).

78. *Id.* at art. 9(3)(a).

79. *Id.* at arts. 9(2)(a)-(b).

80. Draft Directive, *supra* note 37, at art. 9(3). The protection would also apply retroactively to databases created before the enactment of the Directives.

81. *See, e.g.*, Suzanne Perry, *Longer Protection in Database Directive Proposed*, REUTERS EUR. COMMUNITY REP., March 17, 1993 (quoting Bridget Czarnote, official of DG III, the E.U. Commission's committee on industry and internal market).

82. Sharp & Pavitt, *supra* note 27, at 145.

83. Economic and Social Committee, Opinion on the Proposal for a Council Directive on the Legal Protection of Databases, §§ 2(3b), 2(4) & 3(13), 1993 O.J. (C 19) 3, 4.

84. Perry, *supra* note 81.

protection.[85] These provisions would be critical to determining the length of the sui generis protection, since many databases are continuously updated to remain current. One industry representative proposed a term of twenty-five years, noting that otherwise "[the] effect of the Directive would be to impose on producers a requirement to reconstitute their database design every ten years"[86] simply to refresh the term of protection.

The European Parliament recommended a fifteen-year term of sui generis protection as a compromise,[87] which the Commission adopted in the latest draft of the Directive. The Commission also changed the effect of additions and revisions[88] to provide that the initial term of protection begins on the date when the database is first made available to the public, and recommences upon any substantial change to the database.[89] As one commentator notes, the sui generis protection could now become limitless: "[A]ny database protected by extraction right, and regularly updated, may have in effect perpetual protection provided that regular updating produces substantial modifications of all or part of the contents at least once in every 15 years."[90]

Unfortunately, the latest draft did not sufficiently clarify ambiguities regarding the measure of the "substantiality" of change that would restart the clock on the term of protection. The new definition of a change substantial enough to restart the clock is "the successive accumulation of insubstantial additions, deletions or alteration in respect to the contents of a database, resulting in substantial modification of all or part of the database."[91] "Insubstantial changes" that would not restart the term are defined as "insubstantial additions, deletions or alterations

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85. *Id.*

86. *Id.* The speaker was Richard Baker, legal director of Reed International PLC, the publishing and information group. In fact, the database receives fifty years of copyright protection under Berne, and the contents would receive the 15 year term of the sui generis protection.

87. Parliament Amendments, *supra* note 40, at no. 24, art. 9(3).

88. Perry, *supra* note 81.

89. Amended Directive, *supra* note 5, at art. 12(1); *see also* Parliament Amendments, *supra* note 40, at no. 24, art. 9(3). The Member Countries still do not agree on the appropriate term of protection. Some delegates to the intellectual property working group of the Council of Ministers are arguing for increasing the term to up to fifty years. *Data Protection EU Council Examines Sui Generis Rights*, TECH EUROPE, Mar. 1, 1995.

90. Simon Chalton, *The Amended Database Directive Proposal: A Commentary and Synopsis*, 3 EUR. INTELL. PROP. REV. 94, 97 (1994).

91. Amended Directive, *supra* note 5, at art. 12(2)(b); *see also Data Protection EU Council Examines Sui Generis Rights*, TECH EUROPE, Mar. 1, 1995 (noting that the representatives to the Council's intellectual property working group who recently met to discuss the Database Directive are unsure about this provision and would like further "clarification of the criteria that databases have to fulfill" to renew these rights).

which, taken together, do not substantially modify the contents of a database."[92]

An explanation of "insubstantial change" as change that does not "substantially modify" contents will provide no objective way for a database publisher to know when it will refresh the term of protection. These poorly written clauses merely re-describe the phrases in their own terms, and therefore, they do not define concrete standards useful to the information industry.

## B. Provisions Limiting the Use of Database Contents

### 1. *PERMISSIBLE REFERENCES, QUOTATIONS, AND EXTRACTIONS*

The Database Directive requires a database creator to seek various levels of permission to include certain contents in a database. The level of permission needed depends on the kind of material added to a database. For example, if a database creator intended to incorporate a copyrighted work into a database, the owner would first have to obtain the prior authorization of the copyright holder under Article 5 of the Directive.[93]

The Database Directive contains several exceptions to the prior authorization requirement.[94] Bibliographic references, brief quotations and abstracts do not require prior authorization if the database clearly indicates the author and source, provided that the information does not rise to the level of a substantial description or a summary of the contents of the underlying work.[95] Databases may also include material by "quotation" and "illustration" if they comply with Article 10(3) of the Berne Convention,[96] whereby "mention shall be made of the source, and of the name of the author if it appears thereon."[97]

The Database Directive also permits certain uses of database contents without prior authorization. The basic requirement is that a database user may only extract "insubstantial parts" of a database without authorization. The initial draft of the Directive provided that any "insubstantial parts" extracted without authorization be "evaluated quantitatively and qualitatively in relation to the database from which they are copied . . . not to prejudice the exclusive rights of the maker of that database to exploit the database."[98] This early draft did not define

92. Amended Directive, *supra* note 5, at art. 12(3)(b).
93. *Id.* at art. 5(1).
94. *Id.* at art. 5(2).
95. *Id.*
96. *Id.*
97. Berne Convention, *supra* note 8, at art. 10(3).
98. *Id.* at art. 1(3).

"commercial purposes" or "personal private use,"[99] or indicate what amount of copying would trigger infringement.[100]

Members of the database industry were concerned about the muddy language of the provisions and lobbied the European Commission for clearer definitions and objective standards. [101] Many industry associations complained that actual percentage levels were necessary to determine whether copying rose above the level of "insubstantial parts" and thus infringed upon any rights in the databases.[102] The director of the European Association of Information Services argued, "Consider an electronic database of medical data. The recommended dosage of a drug may be only one number amongst millions in that database but it may be the most important item of information concerning that drug. Is it an 'insubstantial part'?"[103] Many database producers did not want to compromise any of their sui generis rights and lobbied the Commission to eliminate the exception in its entirety.[104] The European Parliament's comments to the Commission recommended revisions to these provisions as well.

In response to industry pressure and the recommendations of the Parliament, the Commission partially rewrote these provisions in its latest draft. The Directive now permits the unauthorized extraction of insubstantial parts of a database for private or commercial purposes,[105] and defines commercial purposes as "any use which is not (a) private, personal, and (b) for non-profit making purposes."[106] Those who use the information bear the burden of proof that "the extraction and re-utilization of insubstantial parts do not prejudice the exclusive rights of the owner of that database to exploit the database, and that such practices are not carried out any more than is necessary to achieve the desired objective."[107] The U.S. copyright law similarly requires a judge ruling on whether an unauthorized use is "fair" to consider "the amount and substantiality of the portion used in relation to the copyrighted work as a whole," as well as the harm to the potential copyrighted work.[108] However, the Commission did not add percentage levels or other numerical guidelines for the determination of permissible extraction. Thus, despite the Commission's attempt to clarify this language, the new

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99. *Id.*
100. *Id.*
101. Perry, *supra* note 81.
102. *Id.*
103. *Id.* (Interview with Barry Mahon, executive director of EUSIDIC).
104. *Id.*
105. Draft Directive, *supra* note 37, at arts. 8(4) - (5).
106. Amended Directive, *supra* note 5, at art. 11(7).
107. *Id.* at art. 8(b).
108. 17 U.S.C. §§ 107(3)-(4) (1988 & Supp. 1992).

provisions have not addressed industry complaints that the Directive lacks objective standards for infringement.[109]

### 2. *FAIR USE AND COMPULSORY LICENSES*

The Directive further limits its grant of sui generis rights by requiring that database creators allow free use of their databases for noncommercial private, educational, and research purposes.[110] The Directive requires that all licensing agreements made by database distributors contain a "clause allowing such fair use":

> Whereas distributors of databases should make appropriate provisions in their contracts as regards to the unauthorized re-utilization of the contents of the database by the lawful user where such re-utilization is for strictly private purposes or for the purposes of teaching or research, provided such re-utilization is not carried out for commercial purposes and does not prejudice the exclusive rights of the maker of the database to exploit that database.[111]

Similar provisions are found in the copyright laws of the United States and in the Berne Convention. Section 107 of the 1976 Copyright Act provides that "the fair use of a copyrighted work . . . for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright."[112] The Berne Convention allows signatory countries to decide whether to permit the fair use of protected works for teaching.[113]

For data that is difficult to acquire, the Database Directive could require that a compulsory license issue for the information, although the issue is under reconsideration by the Council of Ministers and may be removed from the final draft of the Directive that will be reviewed by the European Parliament under the co-decision procedure.[114] Article 11(1) of the version of the Database Directive reviewed by the Council of Ministers requires that if the contents of a database "cannot be independently created, collected or obtained from any other source," a compulsory license must issue on "fair use and non-discriminatory terms."[115] To apply for a compulsory license, a database user would submit a declaration "clearly setting out the justification of the commercial purposes pursued and requiring the issue of a license."[116] A

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109. Perry, *supra* note 81.

110. Amended Directive, *supra* note 5, at Recital 38a.

111. *Id.*

112. 17 U.S.C. § 107 (1988).

113. Berne Convention, *supra* note 8, at art. 10(2).

114. *Council Seeks Accord on Database Directive*, REUTERS EUR. COMMUNITY REP., May 31, 1995; *EU Policy Updates: Data Protection - Database Directive*, BUSINESS EUROPE, June 19, 1995.

115. Amended Directive, *supra* note 5, at art. 11(2).

116. *Id.* at art. 11(1).

compulsory license would not be available simply to save time, effort, or money.[117] In such cases, the database user would be required to negotiate a private license with the database owner or to collect the data independently.[118]

The compulsory licensing requirement does not apply to all databases produced in the European Union. It applies solely to databases available to be "freely" interrogated by the public, and produced either by a public entity, an entity under a duty to provide the information, or a firm with a monopoly on the information acquired through an exclusive governmental concession.[119] The concept of "free interrogation" of a database is not defined, rendering "unclear whether either a requirement for payment or a provision limiting the mode or extent of interrogation of a database will mean that the database is not made publicly available, and so is not subject to compulsory licensing."[120]

Members of the information industry reacted strongly against the compulsory licensing provision.[121] Charles Clark, director of the Federation of European Publishers, recommended that the Commission include a five-year "breathing period" before a new database would be susceptible to compulsory licensing.[122] He argued that this would be an effective incentive for the creation of databases in the public interest, such as collections of medical information. Since these databases often generate lower revenues, they would require longer periods of exclusivity for publishers to recoup their initial investments.[123] Despite the benefits to the database industry of Clark's suggestion for a breathing period, the Commission did not include one in the latest version of the Directive. However, from the recent response of the Council of Ministers (the text of which is unavailable at publication),[124] it appears the lobbyists may yet prevail on this issue.

### 3. *RECIPROCITY*

The Directive contains reciprocity provisions that limit the availability of the sui generis rights to certain companies. The Directive

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117. *Id.*

118. *Id.*

119. *Id.* at arts. 11(2)(a)-(b).

120. Chalton, *supra* note 90, at 98.

121. Perry, *supra* note 81.

122. *Id.*

123. *Publishers' Rights in the Information Society*, TECH EUROPE, Sept. 6, 1994. European publishers who have voiced their opposition to the compulsory license provision include Federation of European Publishers, European Newspaper Publishers Association, Federation of Associations of Periodical Publishers, and International Group of Scientific, Technical and Medical Publishers. *Id.*

124. IP(95)572 (European Union press release discussing Council of Ministers' decision regarding the Database Directive).

grants national treatment for any copyrights protecting the format and contents of a database, but the sui generis protection is much more restricted. Sui generis rights extend exclusively to nationals of member countries of the E.U. and to database producers who establish their "habitual residence" in the E.U.[125] In the case of a work made for hire under Article 3(4) of the Directive,[126] a database producer must have a "registered office, central administration or principal place of business" in the E.U., or its "registered office . . . must possess an effective and continuous link with the economy of one of the Member States."[127]

Databases produced by companies in non-member countries without E.U. offices will receive sui generis protection only if their countries have comparable laws or have formed agreements with the E.U. to allow for such protection by the E.U.[128] Article 13(3) allows the Council to form such an agreement with a country that fails to meet the reciprocity requirement.[129] Although one interpretation of this provision is that "the Commission hopes . . . to encourage wider availability of the new sui generis right,"[130] the operation of the reciprocity requirement would probably not have this effect. Instead, the reciprocity provisions are a grave threat on many levels. The provisions could have adverse effects on international trade and the global harmonization of intellectual property protection, as discussed in Parts IV and V.

## IV. DATABASE PROTECTION IN THE UNITED STATES

As discussed in Part II.B.3. above, the Database Directive restricts sui generis protection to databases made by companies with their "principal place of business" in the European Union or "an effective and continuous link" with the economy of a member state,[131] and to databases produced in countries where the national laws prohibit the unauthorized use of database contents.[132] This part examines the protection provided to compilations of information in the United States to illustrate that the intellectual property laws in this country do not provide similar protection to uncopyrightable database contents and, therefore, will not meet the reciprocity requirements of the Directive. As a result, database publishers in the country that is the world's largest database supplier will be denied sui generis protection for their products within the E.U..

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125. Amended Directive, *supra* note 5, at art. 13(1).
126. *Id.* at art. 3(4).
127. *Id.* at art. 13(2).
128. *Id.* at Preamble, § 38.
129. *Id.* at art. 13(3).
130. Chalton, *supra* note 90, at 99 (emphasis omitted).
131. *Id.*
132. *Id.*

### A. Protection for Facts After *Feist*[133]

The sui generis rights in the Database Directive aim to protect databases that are primarily collections of raw facts. Compilations of facts remain unprotected under U.S. copyright laws, as the Supreme Court recently reaffirmed in *Feist Publications, Inc. v. Rural Telephone Service Co.*[134] In that case, the Supreme Court reiterated the "bedrock principle of copyright that mandates the law's seemingly disparate treatment of facts and factual compilations."[135] The plaintiff in *Feist* was a public utility that provided telephone service to certain regions in Kansas.[136] Kansas state law required the Rural Telephone Service Company to issue a directory containing an alphabetical listing of the names, addresses, and telephone numbers of its customers.[137] Defendant Feist Publications printed a "white pages" type directory that contained the same sort of information, but for a larger geographical area than the plaintiff's directory.[138] The Plaintiff sued the Defendant for infringement of its copyright in the directory because 1,309 entries in the Defendant's directory were the same as the Plaintiff's directory.

The Supreme Court held that the defendant did not infringe the plaintiff's copyright. Despite the fact that it had copied a substantial amount of plaintiff's telephone directory – 1,309 entries[139] – the defendant did not copy any protectable elements.[140] The Court found the contents of the directory – names, telephone numbers, and addresses – to be unprotectable facts, leaving only its selection, arrangement, and coordination as potentially protectable elements of the directory. The Court considered the Plaintiff's telephone directory to be "garden-variety" as it was arranged in alphabetical order, a method of organization that evidenced no originality.[141] Writing for a unanimous Court, Justice O'Connor stated that the Copyright Act only protects works "possess[ing] at least some minimal degree of creativity."[142] The level of creativity can be "extremely low,"[143] yet originality must exist in some form.

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133. Feist Publications v. Rural Tel. Serv., 499 U.S. 340 (1991).
134. *Id.* at 344-45.
135. *Id.* at 347.
136. *Id.*
137. *Id.*
138. *Id.*; *see also* Michael Epstein & Kenneth R. Parks, *Law Stresses Originality in Protection of Databases*, N.Y.L.J., Apr. 12, 1991, at S2.
139. *Feist*, 499 U.S. at 349.
140. *Id.*
141. *Id.* at 345.
142. *Id.*
143. *Id.*

In its discussion of the failure of the directory's contents to qualify for copyright protection, the Court restated principles underlying the lack of copyright protection for facts. Under the 1976 Copyright Act, facts and ideas do not qualify as "original works of authorship"; therefore, according to the Court, protecting factual contents would violate the "most fundamental axiom of copyright law."[144] Copyright principles follow "the First Amendment doctrine that free speech encompasses 'public access to discussion, debate and dissemination of information and ideas'."[145]

Copyright laws will only protect a collection of facts when the facts are "selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship."[146] This copyright "extends only to the material contributed by the author of such work" and not to any unprotectable contents.[147] Regardless of the level of creativity evidenced in the compilation of factual elements and the labor expended to create the compilation, as Justice O'Connor wrote in *Feist*, the "facts themselves do not become original through association."[148] Thus, a copyright in a factual compilation is "thin," because the elements–the facts themselves–receive no protection.[149]

The *Feist* Court noted that its decision was based largely on the Constitutional "objective of copyright . . . `[t]o promote the Progress of Science and useful Arts.'"[150] The Court interpreted this Constitutional mandate to reward the fruits of the creative process and not the labor involved in the process itself, commonly called "sweat of the brow."[151] Before the *Feist* decision, most courts had abandoned a "sweat of the brow" theory, as the Second Circuit did twenty-eight years ago in *Rosemont Enterprises, Inc. v. Random House, Inc.*[152] The *Feist* case completely abrogated the "sweat of the brow" theory as a basis for copyright protection.[153] Therefore, "a subsequent compiler remains free to use the facts contained in another's publication to aid in preparing a

144. *Id.* at 344.

145. Cable News Network v. Video Monitoring Servs. of Am., 940 F.2d 1471, 1479 (11th Cir. 1991) (quoting Bd. of Educ. v. Pico, 457 U.S. 853, 866 (1982)).

146. 17 U.S.C. §101 (1988).

147. *Id.* at § 103.

148. *Feist*, 499 U.S. at 349.

149. *Id.*; *see also* Epstein & Parks, *supra* note 138.

150. 499 U.S. at 349 (quoting U.S. Const. art. I, § 8, cl. 8).

151. *Id.* at 352-53.

152. 366 F.2d 303, 306-07 (2d Cir. 1966).

153. State law may protect compilations based on a variation of the "sweat of the brow" misappropriation theory; however, preemption issues would exist in application of this state doctrine to protection of this subject matter, which is covered by the Copyright Act.

competing work, so long as the competing work does not feature the same selection and arrangement."[154]

The Supreme Court ultimately decided *Feist* using a fact-specific analysis of the copyrightability of a typical "white pages" telephone directory.[155] The Court found that copyright would not protect telephone directories arranged in alphabetical order, as they showed absolutely no evidence of independent creation or a "minimal degree of creativity."[156] In fact, the *Feist* Court's test for "some minimal degree of creativity" was itself "minimal," in that it provided little guidance for courts to decide whether different kinds of compilations should receive copyright protection.[157] The decision merely stated that "the vast majority of compilations will pass this test, but not all will. There remains a narrow category of works in which the creative spark is utterly lacking or so trivial as to be virtually nonexistent."[158] This "narrow category" of unprotected works would probably include alphabetical, numerical, and chronological listings.[159] For example, a case decided soon after *Feist* found that "typical yellow pages" telephone directories were uncopyrightable.[160] However, many databases will fall into a gray zone under the *Feist* Court's test.

Courts already offer varied interpretations of the vague standard announced in *Feist*. Most courts uphold copyright protection for compilations that reflect anything beyond entirely routine methods of organization, making the requisite level of creativity seem truly minimal.[161] In *Kregos v. Associated Press*,[162] the Second Circuit held that forms used to compile baseball pitching statistics were copyrightable since the plaintiff had selected nine categories from "scores of available statistics about pitching performance."[163] The *Kregos* court found that the plaintiff's method of selection sufficiently reflected the "personal opinion, taste, or judgment" of the creator to warrant copyright protection.[164]

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154. *Feist*, 499 U.S. at 349.

155. *Id.*

156. *Id.* at 345.

157. *Id.*

158. *Id.* at 359.

159. COPYRIGHT OFFICE, GUIDELINES FOR REGISTRATION OF FACT-BASED COMPILATIONS 1 (rev. Oct. 11, 1989).

160. Bellsouth Advert. & Publishing Corp. v. Donnelley Info. Publish., 999 F.2d 1436, 1443 (11th Cir. 1993), *cert. denied*, 114 S. Ct. 943 (1994).

161. *See also* Kristin Loeber, Feist Publications, Inc. v. Rural Telephone Service Company, Inc.: *Mopping the Sweat off of the Brow*, 44 BAYLOR L. REV., 409 (1992).

162. 937 F.2d 700 (2d Cir. 1991), remanded as 795 F. Supp. 1325 (S.D.N.Y. 1992), *aff'd*, 3 F.3d 656 (2d Cir. 1993).

163. *Id.*

164. *Id.*

In *Kregos*, the Second Circuit tried to give teeth to the "minimal creativity" standard announced in *Feist* by using evidence of personal opinion, taste, and judgment as a mark of creativity. The Court noted that under *Feist*, the copyright in a factual compilation was thin but "we do not believe it is anorexic."[165] However, selecting categories of information will not always meet the Second Circuit's "personal judgment" test. In the same year as the *Kregos* decision, the Second Circuit denied copyright protection to the maker of a chart used to collect horse racing statistics. The statistics were arranged on "purely functional grids that offer no opportunity for variation." [166] The court found that the selection of categories for the chart involved inadequate personal judgment to meet a minimum degree of creativity.[167]

In a case decided the following year, *Corsearch, Inc. v. Thomson & Thomson*,[168] the District Court for the Southern District of New York added their own criteria to the test for original selection, coordination, and arrangement of a database. The District Court held that the formatting "enhancements" of Thomson & Thomson's Trademarkscan database of trademark information evidenced sufficient creativity to uphold its copyright protection.[169] The District Court looked for evidence of "enhancement and programming of the state trademark data, as well as other contributions that establish the originality and requisite creativity."[170] Using this test, the court found infringement of the copyrightable "enhancement[s]" in the database, because the defendant could have selected and rearranged the data in an original format but instead sold reports duplicating the format exactly.[171] The significant additions to the test for creativity in this decision illustrate the need for courts to put their own gloss on the Supreme Court's gossamer standards.

Although the actual contents of the database are not copyrightable, the test for copyright infringement of a database requires a court to examine the contents. The general test for copyright infringement is whether an allegedly infringing copy is "substantially similar" to a

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165. Key Publications v. Chinatown Today Publish. Enter., Inc., 945 F.2d 509, 514 (2d Cir. 1991); *see also* Budish v. Gordon, 784 F. Supp. 1320, 1333 (N.D. Ohio 1992) (quoting *Key Publications*).

166. Victor Lalli Enters. v. Big Red Publish., 936 F.2d 671 (2d Cir 1991).

167. *Id.* The U.S. Court of Appeals for the Seventh Circuit recently asked the same question in Mid Atlantic Title Co. v. Kirk, 991 F.2d 417 (7th Cir. 1993), and remanded the case for reconsideration of whether a compilation of title search information contained sufficient originality for copyright protection.

168. 792 F. Supp. 305 (S.D.N.Y. 1992).

169. *Id.*

170. *Id.* at 322.

171. *Id.* at 305.

copyrighted work.[172] In the context of compilations, courts test whether any of the copyrightable elements of a compilation–arrangement, selection, or coordination–are substantially similar.[173] Courts compare the arrangement of entries, the method of selection of entries for inclusion in the database, and the coordination of the entries into database form to determine whether the defendant's database is substantially similar to the plaintiff's.

When the database format is uncopyrightable, the percentage of contents copied becomes unimportant. For example, in *Key Publications v. Chinatown Today Publishing Enterprises,* the court found no substantial similarity in the databases, and therefore no infringement, even though 17 percent of the entries were exactly the same.[174] Similarly, in *Bellsouth Advertising and Publishing Corp. v. Donnelly Information Publishing, Inc.* ,[175] a typical "yellow pages" directory was held to be uncopyrightable, so the fact that the plaintiff's and defendant's directories shared the same 37 erroneous listings could still not rise to the level of infringement.[176] These cases show that significant duplication of entries may not be adequate grounds for infringement. Major duplication of contents seems to evade a finding of copyright infringement if accompanied by even a minor modification of format. Therefore, aside from cases of exact duplication, the copyright infringement protection for a compilation of facts is fairly meager.

The merger doctrine may present a further barrier to copyright protection for factual compilations.[177] The merger doctrine prevents a copyright from attaching to a work in which the idea and expression "merge," because only one expression of the idea is possible.[178] In the database context, facts gathered in the most practical, user-friendly format will retain no protectable elements. This is a favorable outcome, as scholar Paul Goldstein notes, because "variety" is the last thing that consumers desire in fact works such as directories."[179] The facts from the *Feist* case serve as an example of how the merger doctrine defeats copyright protection in a compilation. Few arrangements are possible for

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172. Arnstein v. Porter, 154 F.2d 464 (2d Cir. 1946); GOLDSTEIN, *supra* note 6, at § 7.1.1.

173. GOLDSTEIN, *supra* note 6, at §§ 7.3.1, 8.4, 8.6; 1976 COPYRIGHT ACT §§ 101, 103(b) (definition and scope of copyright protection of compilation and collective work).

174. Key Publications v. Chinatown Today Publish. Enter., Inc., 945 F.2d 509, 516 (2d Cir. 1991).

175. Bellsouth Advert. & Publishing Corp. v. Donnelley Info. Publish., 999 F.2d 1436, 1436-45 (11th Cir. 1993), *cert. denied,* 114 S. Ct. 943 (1994).

176. *Id.*

177. Mazer v. Stein, 347 U.S. 201, 219 (1954); Baker v. Selden, 101 U.S. 99, 201, 217 (1880).

178. Mazer v. Stein, 347 U.S. 201, 219 (1954); Baker v. Selden, 101 U.S. 99, 201, 217 (1880).

179. GOLDSTEIN, *supra* note 6, at § 2.3.2.

typical "white pages" telephone directories, which list every telephone customer in a defined geographic area. Likewise, the *Kregos* court stated that copyright protection would not be available if few ways existed to organize horse racing or baseball pitching statistics.[180] However, courts differ on how to apply the merger doctrine, and sometimes reach an undesirable outcome, as in the Fourth Circuit case which upheld protection for a database because its format was designed to be "readable" for a lay person.[181]

The merger doctrine is based on the separation of unprotectable ideas from the protectable expression of such ideas. The fundamental importance of the idea/expression dichotomy in the case of factual works was noted over a century ago, in the Supreme Court's decision in *Baker v. Selden*.[182] The Court denied copyright protection to the methodology contained in a book that explained a new system of double-entry bookkeeping. Selden's valid copyright in his book, the Court stated, could not be used to prevent others from using the factual knowledge the book contained.

> The copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds, or to the diagrams which he employs to explain them, so as to prevent an engineer from using them whenever occasion requires. The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book.[183]

The Court's holding in *Baker v. Selden* succinctly summarizes the U.S. policy on the protection of factual information that continues to this day. It is true that "great praise may be due to the plaintiffs for their industry . . . yet the law does not contemplate their being rewarded" with a copyright.[184] The copyright policy of the U.S., as reaffirmed by *Feist* and the cases that have followed, continues to "eliminate the economic waste of a rule that [would require] competitors to reinvent the wheel, incurring the same expense as the first copyright owner to produce an identical product."[185]

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180. Kregos v. Associated Press, 3 F.3d 656, 700 (2d Cir. 1993); *see also* Victor Lalli Enters. v. Big Red Apple, 936 F.2d 671 (2d Cir 1991) (finding that copyright would not protect "purely functional grids that offer no opportunity for variation").

181. U.S. Payphone v. Executives Unlimited of Durham, 18 U.S.P.Q. 2d 2049 (BNA) (4th Cir. 1991).

182. Baker v. Selden, 101 U.S. 99 (1880).

183. *Id.* at 103.

184. *Id.* at 105.

185. GOLDSTEIN, *supra* note 6, at § 8.4.1.2.

## B. Other Sources of Legal Protection for Database Contents

There are some U.S. laws that protect databases in a way that is comparable to the sui generis protection of the Database Directive–state misappropriation laws. The Database Directive itself is described as a misappropriation law in its Preamble, which states that the Directive was enacted "to safeguard the position of makers of databases against misappropriation of the results of the financial and professional investment incurred in obtaining and collecting data."[186] In the United States, state law claims of misappropriation have often served "to fill the interstices of copyright."[187]

However, the question remains whether state misappropriation laws may be preempted by section 301 of the Copyright Act in the context of database contents.[188] Section 301 provides that the Copyright Act preempts

> all legal or equitable rights that are equivalent to any of the exclusive rights within the general scope of copyright as specified by section 106 in works of authorship that are fixed in a tangible medium of expression and come within the subject matter of copyright as specified by sections 102 and 103.[189]

Courts mainly focus on the third test when deciding cases regarding factual compilations, namely, whether the work falls within the scope of the subject matter of copyright law.[190] Therefore, a state cause of action will be preempted by federal copyright law "if the subject matter of the state-law right falls within the subject matter of the copyright laws and the state-law right asserted is equivalent to the exclusive rights protected by federal copyright law."[191]

The application of Section 301 is inconsistent because of the ambiguity of the phrase "come within the subject matter of copyright."[192] Although the Copyright Act does not protect raw facts, U.S. courts remain split on whether "facts" lie within or without the subject matter of

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186. Amended Directive, *supra* note 5, at Preamble § 28.

187. GOLDSTEIN, *supra* note 6, at § 15.4.2.

188. Int'l News Serv. v. Associated Press, 248 U.S. 215 (1918) (state misappropriation law not preempted).

189. 17 U.S.C. § 301 (1988).

190. GOLDSTEIN, *supra* note 6, at §§ 15.2.3, 15.7; *see also infra* note 191.

191. Kregos v. Associated Press, 3 F.3d 656, 666 (2d Cir. 1993) (false designation of ownership claim grounded solely on defendant's copying of plaintiff's protected expression held preempted by copyright law); Computer Assocs. Int'l v. Altai, Inc., 982 F.2d 693, 717 (2d Cir. 1992) (unfair competition and misappropriation claims based on the copying of plaintiff's protected expression preempted); Walker v. Time-Life Films, 784 F.2d 44 (2d Cir. 1986) (plaintiff's state law claim that defendant's movie copied his book preempted); Xerox Corp. v. Apple Computers, Inc., 734 F. Supp. 1542 (N.D. Cal. 1990) (preemption of reverse passing off claim in which plaintiff alleged it was constructive author of defendant's product).

192. GOLDSTEIN, *supra* note 6, at § 15.2.3.

the Act. Some courts have upheld state misappropriation claims for improper use of the uncopyrightable material within a copyrightable work.[193] However, most courts find that "[s]tate law claims do not avoid preemption simply because they are based upon the improper use of uncopyrightable material contained in works properly subject to copyright."[194]

In addition, state computer crime laws are a potential source of protection for database contents.[195] Computer crime laws have been enacted by forty-nine states to prohibit the unauthorized access, use, and damage of such computer-stored information when such information has been kept confidential as a trade secret.[196] Despite the differences between such laws and the provision of the Directive–that they require that the information be confidential and provide for criminal liability–these statutes share the goals of the Directive, to prevent the unauthorized extraction and reuse of computer-stored information.[197] However, the E.U. will probably focus on the differences between the Directive and computer crime laws, not the similarities, as they do not seem to desire reciprocity, as discussed in Part V.

## V. INTERNATIONAL CRITICISM OF THE DATABASE DIRECTIVE

The Database Directive has not received widespread acceptance in the international database industry. Even within the E.U., opinions are

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193. Bellsouth Advert. & Publish. Corp. v. Donnelley Info. Publish., Inc., 933 F.2d 952, 957 n.11 (11th Cir. 1991), *vacated*, 977 F.2d 1435, *aff'd*, 999 F.2d 1436 (11th Cir. 1993) (stating that data "accumulated by the 'sweat of the brow'" may find protection under unfair competition); Mayer v. Josiah Wedgewood & Sons, Ltd., 601 F. Supp. 1523, 1533-34 (S.D.N.Y. 1985) (citing the legislative history of the Copyright Act and its examples of state misappropriation claims not preempted by the Act, including taking of "hot news" and improper invasion of information in a database). Note, *Standards of Protection for Databases in the European Community and the United States: Feist and the Myth of Creative Originality*, 27 G.W. J. INT'L L. & ECON. 457, 500 (1994) (arguing that a state right against misappropriation or unfair extraction would not be preempted under the subject matter test).

194. Nash v. CBS, Inc. 704 F. Supp. 823, 832 (N.D. Ill. 1989), *aff'd*, 899 F.2d 1537 (7th Cir. 1990) (state law claim for improper use of uncopyrightable material contained in plaintiff's copyrighted book preempted); *see also* Paul T. Sheils & Robert Penchina, *What's All the Fuss About* Feist? *The Sky is Not Falling on the Intellectual Property Rights of Online Database Proprietors*, 17 DAYTON L. REV. 563, 584 (1992). Although section 301 is now the primary means to find preemption of the Copyright Act, the Supremacy Clause of the U.S. Constitution may also operate to preempt state law protection of facts. U.S. Const. art. VI, § 2. The Supremacy Clause will preempt a state law that conflicts with, or hinders the objections of federal law and thus "will so offend the federal balance that it must be invalidated." GOLDSTEIN, *supra* note 6, at § 15.3.3.

195. *See, e.g.*, Cal. Penal Code § 502 (1992); FLORIDA COMPUTER CRIMES ACT, FLA. STAT. ANN. § 815.01 -.07 (West 1976 & Supp. 1991).

196. *Id.*

197. Amended Directive, *supra* note 5, at Preamble, no. 7.

mixed as to the relative benefits and shortcomings of the legislation. [198] This part addresses current reactions to the proposal, and potential reactions upon its passage, with particular emphasis on the reactions in the countries that are the world leaders in database protection, the United States and Great Britain.

## A. Reactions to the Directive in the United States

The United States is the world's largest producer and distributor of databases.[199] As such, it seems a likely target for the Database Directive's reciprocity provisions, which withholds content protection for databases produced in countries without similar protection. Since U.S. laws do not provide similar protection for database contents, the contents of databases produced in this country will remain unprotected in the E.U.[200] Congress would probably need to pass sui generis legislation to obtain reciprocity in the E.U. and prevent U.S. database producers from being at a competitive disadvantage in the E.U.

Professor Paul Goldstein notes that while *Feist* held that *copyright* protection is unavailable for database contents, it does not preclude database content protection by some other means.[201] He writes that "if Congress wishes to [protect factual database contents] . . . it must do so under some constitutional power other than the copyright power."[202] Thus, although *Feist* abrogated copyright protection for the products of

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198. Henry H. Perritt, Jr., T *he International Legal Information Network*, 38 BILL. L. R EV. 555 (1992); J.H. Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms, Symposium: Toward a Third Intellectual Property Paradigm*, 94 COLUM. L. REV. 2432, 2496 (1994) (calling the Database directive "a legal monstrosity"); *but cf.* Christian Tyler, *A Modern-Day Caxton*, FINANCIAL TIMES, Dec. 24, 1994, at 3 (quoting publisher of electronic databases who fears that data protection under the EC directives "will be much too weak").

199. *See* DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1992, at 62-2. The Impact Program identified Japan as another target country of the Database Directive. The Japanese government, through the Ministry of International Trade and Industry (MITI), has instituted several programs to foster the development of information services. Two programs "emphasize the medium- to long-term at which Japan may pose in international markets for electronic information. The first is the designation by MITI and the Ministry of Post and Telecommunications of more than 60 towns and areas outside Tokyo as testing grounds for the use of advanced information technologies . . . . In June 1991, MITI announced that it intended to make a large investment (MECU 24) by [sic] a 'Hyper Network' laboratory." 1991 Impact Report, *supra* note 4, at 5. The report may have overstated Japan's true "threat" to the European Union, as this laboratory is actually a joint venture with France Telecom. *Id.*

200. *See* text in Part IV *supra*.

201. Paul Goldstein, *Copyright and Legislation: The Kastenmeier Years*, 55 LAW & CONTEMP. PROBS. 79 (1992). *Cf.* Note: *Standards of Protection for Databases in the European Community and the United States:* Feist *and the Myth of Creative Originality*, 27 G.W. J. INT'L L. & ECON. 457, 500 (1994) (supporting congressional enactment of a scheme of copyright protection for databases exceeding that for the E.U.'s Database Directive, to allow the United States to continue to dominate the world database market).

202. Goldstein, *supra* note 201.

the "sweat of the brow,"[203] such protection could still be provided outside of the domain of copyright. Goldstein notes that the Commerce Clause of the U.S. Constitution would be an appropriate source for federal power over the protection of the factual contents of databases.[204]

Whether the United States will adopt laws that directly protect database contents is unclear. The Department of Commerce has repeatedly identified intellectual property protection for databases as a major concern.[205] In the year the Supreme Court decided *Feist*, a Commerce Department report noted the negative impact the decision could have on the information industry.[206] The report feared that "it could cheapen the value of databases and be a disincentive to produce them."[207] In a report issued the following year, however, the Commerce Department backed away from this statement, arguing instead that "[t]he broad public interest in promoting the dissemination of information to our citizens must be balanced with the need to ensure the integrity of intellectual property rights and copyrights in information and entertainment products."[208] The current Commerce Department position advocates the "globalization of the information services industry" and "places a high priority on removing barriers to cross-border trade and to investment."[209] Thus, the Commerce Department's trend toward open borders indicates that, while sui generis protection may not be *completely* out of the question, it is exceedingly unlikely.

The issue of database contents protection could become an obstacle to U.S.-E.U. trade. The long-standing U.S. policy has been to support the free dissemination of information, and to condemn such protection elsewhere.[210] U.S. trade policy has also focused on an international agenda that encourages the globalization of information services.[211] In 1992, the Commerce Department reported that the U.S. government placed a high priority on removing barriers to trade and investment by U.S. information service companies, and has sought to remove such

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203. *Feist*, 499 U.S. 340, 352-53.

204. Goldstein, *supra* note 201.

205. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1992, at 26-2.

206. *Id.*; *see also* Note: *Standards of Protection for Databases in the European Community and the United States:* Feist *and the Myth of Creative Originality*, 27 G.W. J. INT'L L. & ECON. 457, 500 (1994) (arguing for a reversal of Feist to protect the U.S. database industry).

207. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1992, at 26-2.

208. DEPT. OF COMMERCE, Administration Policy Statement on the National Information Infrastructure: Agenda for Action, 58 Fed. Reg. 49025, 49030 (1993).

209. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994, at 25-1.

210. President Clinton often states that reciprocity is a two-way street, relating the need for other countries to open their markets to U.S. goods if they want the U.S. market to remain open to theirs. *See, e.g., GATT's Last Hurray a Global Triumph*, HOUS. CHRON., Dec. 19, 1993, at 2 (appealing to Europe to open its market).

211. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1992, at 26-1.

barriers through its discussions and negotiations with members of the General Agreement on Tariffs and Trade as well as in bilateral talks with Mexico, Canada, the European Community (E.C.), and other countries.[212]

Apart from action by the U.S. government, database producers in the United States might attempt to qualify for protection under the Database Directive by publishing a version of their databases in the E.U. This strategy, however, would be a costly means of circumventing the reciprocity provisions of the Database Directive. Database producers in the United States also are likely to continue using data from European databases, as permitted by *Feist*.[213] Lacking database protection in the United States, European companies may attempt to stop the transfer of data to the United States and forego the entire U.S. information market.

## B. Responses in Great Britain

Great Britain is the main supplier of information services in the E. U.[214] To preserve its position as the market leader in database production in Europe, Britain already grants databases a generous fifty years of copyright protection through provisions in Britain's Copyright Designs and Patent Act.[215] The Act protects a database as a literary work if its creator shows she used "mere skill, judgment and labor," a standard much lower than the "originality" requirement of U.S. copyright law.[216]

If the European Council of Ministers passes the Database Directive, each of the E.U. member states will be required to enact its provisions into law within two years. As an E.U. directive, the new provisions would preempt the database contents protection in the Copyright Designs and Patent Act.[217] To comply with the E.U. regulation, Britain would have to shorten the duration of protection it provides to database contents. Thus, the threat to Britain stands opposite to the threat faced by the U.S., with regard to data protection, as the Directive would "undermine Britain's position of having arguably the best protection for databases among EC states."[218]

Information industry members fear they will suffer an enormous setback if Britain has to lower its term of protection from fifty to fifteen

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212. *Id.*

213. Feist Publications v. Rural Tel. Serv., 499 U.S. 340, 352 (1991).

214. *See* text accompanying *supra* note 16.

215. Copyright Designs and Patent Act of 1988, §§ 3(1)(a)-(b). The Act defines "literary work" as "any work, other than a dramatic or musical work, which is written, spoken, or sung, and accordingly includes (a) a table or compilation, and (b) a computer program."

216. *Id.*; *see also* J.H. Reichman, *Electronic Information Tools–The Outer Edge of World Intellectual Property Law*, 17 DAYTON L. REV. 797, 804 (1992); 17 U.S.C. § 102(a) (1988).

217. *See* text accompanying *supra* notes 16-17.

218. David Owen, *Copyright Fears for Address Database*, FINANCIAL TIMES, Aug. 10, 1992, at 6.

years.[219] Many British information services trade associations have accused the European Commission of legislating at Great Britain's expense. The President of the Automobile Association, owner of one of Britain's largest databases, stated, "There is a feeling that the directive is drafted more according to the political concerns of the Commission rather than the problems of the real world."[220] One industry representative noted that "the 'unfair extraction' right is a very poor exchange for the very well understood copyright, which has worked well in the UK.[221] Britain's Information Technology Marketing Council has called the Directive unworkable and a threat to the industry.[222]

The Database Directive would affect the intellectual property of a wide range of industries. The Royal Mail expresses concern about protection for its Postal Address File, a copyrighted list of British postal codes which generates millions of pounds of revenue for the Mail each year.[223] The Automobile Association worries about the potential effects of the Directive on its computerized cartography and road reports operations.[224] Many banks, including Barclays and the Royal Bank of Scotland, repeatedly complain about the Directive's threat to the transborder flow of financial data for market transactions, and have been lobbying actively against the Directive.[225]

British trade associations have mobilized to fight the Directive. The Direct Marketing Association (DMA) exhibited a special group to lobby the European Commission and European Parliament to allow Britain to retain the fifty years of protection for database contents currently available under its copyright laws.[226] Colin Fricker, legal affairs director of the DMA, considers the Directive "ridiculous."[227] He insists that the Directive would not even appease most European database producers, since "[t]he thing that unites all direct marketers, whatever their national laws at the moment, is they want better database protection than they

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219. *See infra* notes 225-28.

220. Robin Cobb, *The Database Fightback: Database Producers Oppose Elimination of Copyright Protection*, MARKETING, Feb. 18, 1993, at 30.

221. *Id.*

222. *Pressure Group Claims Database Directive Spells Trouble*, COMPUTER WKLY., Jan. 21, 1993, at 4.

223. Owen, *supra* note 218, at 6.

224. Cobb, *supra* note 220, at 30.

225. *Europe 1993: The Effects of E.C. IT Legislation*, COMPUTER WKLY., Jan. 7, 1993, at 22 (statement by Victor Hume of the Irish Bankers Federation, at a 1992 meeting of the Council of European Computer Users Association).

226. Other opposition groups include FEDIM, which also lobbied against the directive for the protection of personal data; the Periodical Publishers Association (PPA), which opposes the compulsory license provision; and the Confederation of British Industry (CBI).

227. Cobb, *supra* note 220, at 30.

have. They want a protection equivalent to what we have in the UK and Ireland."[228] With the Database Directive in its final stage of the approval process, it is unlikely these groups will convince the European Commission to increase the term of protection in the current proposal from fifteen to fifty years.

## VI. CRITICAL FAILINGS OF THE DATABASE DIRECTIVE

### A. Harmonization at the Expense of Globalization

The European Union maintains a vision of an internal market without barriers–a region where goods, services, capital, and people move freely.[229] The European Council of Ministers aims to achieve a strong internal market through the directives it enacts. The directives are also intended to harmonize the laws of member countries[230] and increase the international market for E.U. goods.

The Database Directive contains provisions consistent with these goals. The first goal of the drafters of the Database Directive was to harmonize the varying approaches member states have taken toward new technology.[231] However, the Berne Convention, the primary international copyright agreement, already protects the original elements of databases.[232] All of the E.U.'s member states are signatories of the Berne Convention, making new harmonizing legislation superfluous. Moreover, the sui generis proposal of the Directive contradicts the terms of the Berne Convention, which explicitly upholds the free dissemination of information by precluding protection of facts and news.

The preferable course of action for the E.U. would be to follow advice given by the World Intellectual Property Organization and submit a proposal to amend Berne.[233] Following Berne instead of creating new sui generis legislation unique to the European Union would avert the inequity of the reciprocity provisions in the Directive. The "High-Level

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228. *Id.*

229. *See supra* notes 22-24 and accompanying text.

230. EEC Treaty, supra note 24 (mandating the goal to streamline procedures and remove the administrative burdens that arise from having to work with different jurisdictions and conflicting laws).

231. For further discussion of technology-oriented legislation in the European Union, *see supra* notes 10-15 and accompanying text.

232. Berne Convention, *supra* note 8, at art. 2(5); *see also supra* notes 60-63, and accompanying text.

233. *Proposed Directive Would Harmonize Community Protection for Data Banks*, 6 WORLD INTELL. PROP. REP. 63, 64 (1992). The World Intellectual Property Organization (WIPO) is a specialized agency of the United Nations established in 1967 to administer UN Unions, including the Berne Convention. All of the Member States of the European Union are members of WIPO, but the European Union itself is not yet a member.

Group on the Information Society," a task force dedicated to reporting on the information market-related issues to the Council of Ministers, also recommended this course of action. Its recent report noted that "the global nature of the services [related to the information industry] . . . means that the Union will have to be a party to international action to protect intellectual property."[234]

The European Commission seems to have drafted the Directive to keep their database protection out of Berne's reach, since as long as countries outside the European Union do not reciprocate with similar protection, their products would not be protected within the European Union.[235] Denying protection to U.S. databases and shortening the length of Britain's protection would enable the E.U. to meet a high priority goal–to foster its cottage. Commentators predict that the reciprocity provisions will place U.S. firms without European subsidiaries at a competitive disadvantage to European firms (or European subsidiaries of U.S. firms). European firms will be able to extract data from databases produced by such U.S. firms, but the U.S. will be prohibited from extracting data from databases produced by the European firms.[236]

The E.U. seems poised to permit the piracy of U.S. databases and to condemn such piracy by non-reciprocating countries. Software piracy is a global problem of astronomical proportions, resulting in losses of about $3.4 billion worldwide in 1993.[237] It is interesting to note that the E.U. is on the Priority Watch List for intellectual property rights practices compiled by the U.S. Trade Representative Office.[238] The fourth and fifth largest software pirates in the world are E.U. member states–Italy and Spain–where revenues lost to U.S. publishers in 1993 were approximately $257 million and $199 million respectively.[239]

Another goal the European Commission hopes the Directive will achieve is to foster the E.U.'s database industry. The Directive will grant limited monopolies over to database producers over data they collect.[240] The latest draft of the Directive disclaims such goals by referencing

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234. Sharp & Pavitt, *supra* note 27, at 143; *see also* text accompanying *infra* note.

235. Amended Directive, *supra* note 5, at art. 13(1) (2); *see also supra* notes 128-33 and accompanying text.

236. Jonathan Band & Laura F.H. McDonald, *The Proposed E.C. Database Directive: The 'Reversal' of* Feist v. Rural Telephone, 6 COMPUTER LAW J. 19 (1992).

237. DATA ANALYSIS GROUP INDUSTRY FORECASTS: SECOND QUARTER, at 103 (compiling information from *The Numbers Sheet*, COMPUTER RESELLER NEWS, Mar. 7, 1994, at 14). Meanwhile, revenue losses from piracy in the United States have decreased from $2 billion in 1990 to $1 billion in 1992. *Id.* at 102.

238. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994, at 27-6.

239. DATA ANALYSIS GROUP, COMPUTER INDUSTRY FORECASTS: SECOND QUARTER, at 103 (compiling information from *The Numbers Sheet*, COMPUTER RESELLER NEWS, Mar. 7, 1994, at 14).

240. Amended Directive, *supra* note 5, at Preamble, nos. 11 and 12.

Articles 85 and 86 of the EEC Treaty[241]–the antitrust provisions of the Treaty–and establishing a Commission review process to occur in three years, whereby the Directive could be amended to mandate licensing if the competition rules fail to avert monopolistic behavior among database producers. Nonetheless, the Commission's underlying goal may be to create mini-monopolies that would provide database creators with incentives for investment and risk-taking in database production.[242] This plan seems destined for failure when the mini-monopolies over information reduce incentive for innovation, since stimulus for creation primarily arises from competition.[243]

The DG-XIII, the European Commission's division on electronics, telecommunications, and technology, has high expectations for the European Union's information services industry. DG-XIII has reported expectations of 700,000 new jobs in the industry before the year 2000.[244] The European Union's information services industry would probably require governmental assistance to meet that goal, since the industry currently employs only about 32,000 persons, and E.U.'s market for electronic information is shrinking steadily.[245] By comparison, the U.S. information services industry employs over one million people in more than 25,000 firms.[246]

Europe's information industry also bears the burden of high production costs. Unlike the mainly English-speaking market of the United States, European companies must cope with a highly fragmented market, divided by varying "technical, legal, tariff, language, and other barriers which are all obstacles to the free movement of information."[247] European database producers must translate their products to accommodate the different languages of the European countries. Additional burdens arise from the high costs of marketing expenses, office space, taxes, and the mandatory benefits and salaries imposed by labor laws.[248] Protecting information in electronic databases could give

241. EEC TREATY, *supra* note 24, at arts 85-6.

242. High-level Group on the Information Society, Europe and the Global Information Society: Recommendations to the European Council 17 (1994) [hereinafter High-level Group on the Information Society].

243. MICHAEL PORTER, THE COMPETITIVE ADVANTAGE OF NATIONS (1990); Sharp & Pavitt, *supra* note 27, at 143.

244. Information and Communications Technologies in Europe, Commission of the European Communities, Directorate-General XIII on Telecommunications, Information Industries and Innovation 66-8 (1991).

245. The 1991 Impact Report reported a growth rate of about 12.5 percent in 1990, with continued slow growth in 1991. 1991 Impact Report, *supra* note 4, at iii.

246. DEPT. OF COMMERCE, U.S. INDUSTRIAL OUTLOOK 1994, at 25-1.

247. Information and Communications Technologies in Europe, Commission of the European Communities, Directorate-General XIII on Telecommunications, Information Industries and Innovation 66-8 (1991); 1991 Impact Report, *supra* note 4, at 45.

248. Collada, *supra* note 19, at 4.

the European Union a competitive advantage it desperately needs to foster this industry. Interestingly, the Directorate-General for Economic and Financial Affairs predicted a five percent increase in European Union exports of goods and services by the end of 1993.[249] This prediction may have hinged on protectionist trade measures like the Database Directive.

## B. Economic Policy, Trade Regulation, Labor Law, or All of the Above?

### *1. GROWING REGIONAL DISPARITY*

Europe is currently experiencing many internal economic problems. A 1993 study by the European Parliament reported that Europe was facing a severe economic downturn, creating skyrocketing unemployment and growing regional economic disparity. The study, designed to assess the impact of E.U. legislation on the less developed regions in the European Union, noted that the relative strengths of regional economies were increasingly divergent, jeopardizing the stability of the European Union.[250] The E.U. legislative bodies and the individual member countries have done little to improve the divergence. Instead, "[g]overnments in Western Europe have responded to the recession by putting up tough new barriers to exports from Eastern Europe."[251]

European Union leaders have done little to improve the unemployment problems in the less-developed countries, and in the European Union in general. The average unemployment rate for the twelve member countries over the last two years was about 11 percent, and "is expected to rise significantly in all member countries" in the

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As one reporter noted

> Western European governments have also begun to try to reduce or remove some of the social benefits that make production so costly, and have met with loud protests from organized labor. In Germany, for instance, the law requires employers to give nearly all industrial workers 30 paid vacation days a year–six weeks–and to add a 13th month's salary at Christmas. Government-mandated health insurance, pension and unemployment contributions add 19.4 percent of each employee's pay to company payroll costs.

Craig R. Whitney, *Western Europe's Dreams Turn Into Recession and Refugees*, N.Y. TIMES, Aug. 8, 1993, at A1, A8.

249. Commission of the European Communities, Directorate-General for Economic and Financial Affairs, Supplement A: Recent Economic Trends, Jan.-Feb. 1993, at 8 [hereinafter Directorate-General Report].

250. European Parliament Directorate-General for Research, *The Impact of 1992 and Associated Legislation on the Less Favoured Regions of the European Community* 7 (IFO INSTITUTE FOR ECONOMIC DEVELOPMENT, C.W. Name & J. Reuters eds., 1991) [hereinafter Report on Less Favoured Regions].

251. Whitney, *supra* note 248, at A8.

coming years.[252] European Commission representatives admit that "the Europe '92 project is not, and never has been, motivated primarily by regional policy objectives, but by the wish to enhance the competitiveness of the Community of Twelve in the global context."[253] Therefore, they do not apologize for the fact that it "will have a less marked effect on employment and do little to relieve the labour market in the regions in question."[254]

Regional disparity is highly visible in the information industry.[255] Britain, France, and Germany dominate the industry, while many countries virtually ignore it.[256] The Database Directive is geared toward improving that situation. The Preamble of the Directive notes the problems associated with the "great imbalance in the level of investment in database creation both as between the Member States themselves, and between the Community and the world's largest database producing countries."[257] The Database Directive might have a positive short-term effect on unemployment in the less developed regions, as it would probably increase the number of low-skill data entry jobs.[258] Recent political changes in Eastern Europe have created a large pool of unskilled, low-cost labor, well-suited for "labour-intensive industries"[259] like data collection.

Nonetheless, the Database Directive will fail to improve the European Union's economic condition if European databases become prohibitively expensive under its provisions. Monopolists typically charge large premiums for their goods. Royalty rates for licensing information in databases created in the European Union would probably include premiums calculated to include the value attributed to the facts and the labor involved in collecting the information, as well as the risks associated with licensing databases in countries without data protection.

The Information Society Group has already rejected the monopoly formula, recommending instead that the European Council of Ministers

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252. Directorate-General Report, *supra* note 249, at 8..

253. Report on Less Favoured Regions, *supra* note 250, at 7.

254. *Id.*

255. 1991 Impact Report, *supra* note 4.

256. See 1991 Impact Report, *supra* note 4, at 11-13; Paul Tate, *Divided We Stand–How IS Managers Confront the Economic Disunity of Europe*, INFORMATION WK., Mar. 15, 1993, at 34.

257. Amended Directive, *supra* note 5, at Preamble, no. 11.

258. Low-skilled jobs involving database production, including data entry and manual scanning, are also low-paying. For example, in the New York metropolitan area in the late 1980s, average weekly earnings of key entry operators ranged from about $235 to $334, while over 50 percent of highly-skilled systems analysts earned over $1200. U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, INDUSTRY WAGE SURVEY: COMPUTER AND DATA PROCESSING SERVICES (1987). These figures indicate that even if the database directive created many such jobs, similar wages in the E.U. would not likely boost standards of living of the less favored regions in the long term.

259. Report on Less Favoured Regions, *supra* note 250, at 24, 32, fig. 2.

create "a new regulatory environment allowing full competition" as a "prerequisite for mobilizing the private capital necessary for innovation, growth, and development."[260] Joint ventures between U.S. and European companies could provide such capital and thus accelerate the growth of Europe's information industry. Commentators encourage the European Union to adopt liberal trade and foreign investment policies to stimulate competition on an E.U.-wide basis and achieve a European market without regional divergence.[261] The agenda of the European Commission's DG-IV committee on competition includes deregulation of the telecommunications industry. Unfortunately, the interventionist policies of the DG-XIII committee on technology, such as this proposed Directive, do not follow the laissez-faire approach of DG-IV.

Joint ventures will most benefit a host country when production is performed on a local level. "Screwdriver factories bring minimal skills; minimum local content requirements bring the higher value, skilled jobs including jobs in management, design and R&D."[262] Local content clauses are not intended "to maximize the value of assets under national (or European) ownership, but to maximize the value of the productive activities of local people."[263] A study of European joint ventures showed how local content requirements "channeled inward investment towards higher value added activities, which brought skilled jobs and better training opportunities (rather than screwdriver plants) to Europe."[264]

Without a strict local content requirement, most joint database production would probably be completed in the United States, where many costs are lower. Unfortunately, the Database Directive does not contain any local production requirements. Instead, the Directive requires that foreign companies maintain an "effective and continuous link with the economy of one of the Member States."[265] This standard is too subjective to enable European companies to benefit fully from joint ventures with U.S. companies.

### C. The Directive as Destructive Long-Term Social Policy

Over the long term, sui generis provisions of the Database Directive would ultimately fail to provide Europe with social welfare gains. The most destructive aspect of the Directive is that it would allow a limited group of database creators to control the dissemination of information. The resulting restrictions on the transfer of knowledge would be

260. High-level Group on the Information Society, *supra* note 242, at 12.
261. Sharp & Pavitt, *supra* note 27, at 143.
262. *Id.* at 145.
263. *Id.*
264. *Id.* at 137.
265. Initial Proposal, *supra* note 37, at art. 11(2).

extremely detrimental to society, as information lies at the core of social advancement. Furthermore, the sui generis provisions lack the focus on promoting creativity and originality present in copyright laws, and reward industry with monopoly. The Directive's provisions "emphasize output and supply, and ignor[e] the value of skills and organizations and the degree to which competition and rivalry provide a spur to innovation."[266] On balance, the negative long-term effects of the Directive would outweigh the short-term economic boost that the European Union seeks.

The most valuable policies that the European Union could adopt during its current economic downturn would contribute to the general welfare of its people. Robert Reich addressed this goal in *The Work of Nations*:

> What is the role of a nation within the emerging global economy, in which borders are ceasing to exist? Rather than increase the profitability of corporations flying the flag, or enlarge the worldwide holdings of its citizens, a nation's economic role is to improve its citizens' standard of living by enhancing the value of what they contribute to the world economy. The concern over national competitiveness is often misplaced. It is not what we own that counts; it is what we do.[267]

Regulations such as patent and copyright laws foster industries that promote economic and social advancement. By contrast, regulations that encourage wasteful, repetitious data collection by low-skilled labor do not provide lasting benefits to society.[268] The information industry has the capacity to "unleash[] unlimited potential for acquiring knowledge, innovation, and creativity,"[269] if encouraged by well-planned legal and economic incentives.

In 1994, the Information Society Group reported to the Council of Ministers that the information revolution presents a great risk of the "creation of a two-tier society of have and have-nots, in which only a part of the population has access to the new technology, is comfortable using it, and can fully enjoy its benefits."[270] Unfortunately, the leaders of the European Union have chosen to take this risk, through misconceived policies that would ultimately obstruct the free flow of information vital to the long-term growth of society. The preferable course both for the information industry and for European society as a whole would be to

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266. Sharp & Pavitt, *supra* note 27, at 145.

267. ROBERT REICH, THE WORK OF NATIONS 301 (1991).

268. *Id.*; *see also* Reichman, *supra* note 216, at 2497-98 ("The front-end gains to publishers under the extraction right may thus conceal the long-term social costs in diminished research and development capabilities at public and semipublic institution, many of which are already indirectly subsidizing so-called private research and development.").

269. HIGH-LEVEL GROUP ON THE INFORMATION SOCIETY, *supra* note 242, at 6.

270. *Id.*

follow the advice of the Information Society Group, "establish safeguards and to ensure the cohesion of the new society. Fair access to the infrastructure will have to be guaranteed to all, as will provision of universal service."[271]

## D. The Ideal of Global Harmonization

International trade and the technological innovation would benefit enormously from the global harmonization of technology-related laws. The concept of "common rules of the game"[272] is the primary U.S. policy in international negotiations regarding intellectual property protection.[273] Recently, the United States sought and achieved common rules for database protection in the North American Free Trade Agreement (NAFTA) negotiations. The Commerce Department's 1994 report notes that "information service companies are expected to benefit from the implementation of" the agreement,[274] which requires Canada and Mexico to protect databases as compilations in provisions that mirror U.S. copyright laws.[275] By contrast, the Database Directive creates "system friction" through direct contradiction and defiance of the General Agreement on Tariffs and Trade (GATT), the Berne Convention, and domestic laws worldwide. The Directive's reciprocity provision would cement this adversarial relationship.

The main objectives of the intellectual property arm of GATT, the GATT Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS),[276] are to protect and enforce intellectual property rights that "contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."[277] A recent round of GATT negotiations expanded the Agreement to cover services, and accomplished further harmonization of international intellectual property protection. The GATT position on data

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271. Reichman, *supra* note 216.

272. *See* SYLVIA OSTRY, BEYOND THE BORDER: THE NEW INTERNATIONAL POLICY ARENA, IN STRATEGIC INDUSTRIES IN A GLOBAL ECONOMY: POLICY ISSUES FOR THE 1990S (OECD ed. 1991).

273. Private trade associations could potentially have a positive effect in the negotiation of globally harmonized information industry policies. The U.S. information industry associations lobby with international counterparts to keep this market open, including the Information Industry Association, which has allied with trade associations in thirteen countries, the Information Technology Association (formerly ADAPSO), and the Electronic Data Interchange Association.

274. DEPT. OF COMMERCE, U.S. Information Outlook 1994, at 25-1.

275. North American Free Trade Agreement, 32 I.L.M. 605 (1993).

276. Doc. MTN/FA of Dec. 15, 1993, Annex 1C, 33 I.L.M. 81 (1994).

277. *Id. at* pt. 1, art. 7.

protection is that "[c]ompilations of data or other material, whether in machine readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such. Such protection . . . shall not extend to the data or material itself."[278] The TRIPS text promotes copyright protection for "expressions" and not "ideas, procedures, methods of operation or mathematical concepts as such."[279]

Discussions following this round of GATT negotiations note the positive harmonizing effect of the TRIPS agreement. In Congressional hearings on the impact of the Uruguay Round on U.S. industries, Jacques Gorlin, consulting economist to the Intellectual Property Committee (IPC), testified that the agreement "limits many of the exceptions and derogations from the standards of protection that had been a concern for the IPC."[280] He commended the limitation on the scope of copyrights in databases to the levels of the Berne Convention:

> The TRIPS text goes a long way in providing the type of international intellectual property protection that the IPC, three successive Administrations and the U.S. Congress sought together over the last seven years through the GATT. On balance, the text contains high standards of protection and enforcement, [and] has a multilateral dispute resolution mechanism. . . Among the critical improvements in the worldwide protection of intellectual property are . . . in copyright . . . [M]embers are required to grant protection to databases and computer programs as literary works under Berne.[281]

Global harmonization is receiving worldwide support from the information technology industry itself. In early 1994, several information technology groups from the European Union, Japan and the United States issued a joint public policy agenda naming global harmonization through multilateral negotiations as the foundation for their recommendation.[282] The joint statement, entitled the White Paper on Global Information Infrastructure, confirmed that "The existing international property law regime, confirmed by the GATT TRIPS Agreement, can well serve the

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278. *Id*. at pt. 2, sec. 1, art. 10(2).

279. *Id*. at pt. 2, sec. 1, art. 9.

280. *GATT: Impact on American Industries and Markup of France's Embargo of U.S Exports of Seafood: Hearing Before the House Subcommittee on Economic Policy, Trade and Environment of the House Committee on Foreign Affairs*, 103d Cong., 2d Sess. (1994) (testimony of Jacques J. Gorlin, Consulting Economist to the Intellectual Property Committee).

281. *Id*.

282. *Info Tech Industries Reach Accord on IPR, Other Policies,* 9 WORLD INTELL. PROP. REP. 79-80 (1995); Excerpts from the White Paper on Global Information Infrastructure, 9 WORLD INTELL. PROP. REP. 85-86 (1995) (prepared by the U.S. Information Technology Industry Council (ITI), the European Association of Business Machines and Information Technology Industry Council (EUROBIT), and the Japan Electronic Industry Development Association (JEIDA)).

needs of the GII [Global Information Infrastructure]."[283] The statement emphasized that the globalization of the information industry necessitates global harmonization of legal rules in order for the industry to reach its full potential,[284] and argued for the "harmonization of the framework of intellectual property rights protection under the international treaties at an international level."[285] The joint statement also encouraged individual governments to pursue harmonization to help resolve the remaining intellectual property issues faced by the information technology industry,[286] a message the European Union should heed.

## VII. CONCLUSION

The Counsel of Ministers is unlikely to suggest further revisions of the Database Directive at this point in the European Commission's legislative process.[287] If the European Council of Ministers enacts the Database Directive in its current form, the U.S. response will probably not be positive. The U.S. trade representatives may argue in negotiations with the European Union that state unfair competition and computer crime laws already fulfill the reciprocity requirement. It remains doubtful that these state laws will qualify for reciprocity.[288] It is also doubtful that the U.S. Congress would pass a similar sui generis law. As the Supreme Court noted in *Feist*,[289] a federal sui generis statute would be necessary to protect database contents, as the addition of a similar provision in the copyright law would blatantly contradict its underlying policy to reward originality. Furthermore, Congress is unlikely to compromise the long-standing policy to maintain the free flow of information. Regardless, the myriad divergent interests of U.S. industries would make sui generis legislation in the area of technology difficult to enact.

As a result of the enactment of the Directive, companies may be forced to incur the high costs to establish an E.U. presence. Alternatively, they may rely exclusively on private contracts, or simply retain the status quo of nonprotection in the European Union. Strategic alliances between U.S. and E.U. companies could help foster the E.U. information industry. Such joint ventures would facilitate the globalization of information services. The European Union should openly encourage foreign

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283. *Id.* at 86.
284. *Id.*
285. *Id.*
286. *Id.*
287. *See supra* notes 21-22.
288. *See supra* notes 190-95.
289. 499 U.S. 340, 354 (1991).

investment, simultaneously protecting local economic development with strong local content requirements.

With many international organizations–including several European groups–working successfully to integrate the world's intellectual property protection, the European Union has little justification or need to pass the Database Directive. Despite several rounds of amendments, the Directive remains fatally flawed as intellectual property law, international trade measure, and internal economic regulation. The most dangerous aspect of the Directive is its potential to stifle access to information, thereby allowing a few to control the knowledge of the many. The long-standing U.S. policy to encourage the free flow of information has not prevented the United States from dominating the worldwide information industry. Europe should focus on policies and regulations that will simultaneously encourage economic growth and safeguard the democracy of ideas. In the words of Europe's own task force on information policy, the Information Society Group, "the information society has the potential to improve the quality of life of Europe's citizens, the efficiency of our social and economic organisation and to reinforce cohesion."[290] This will only be possible if the European Council of Ministers votes to preserve the free flow of information.

290. High-level Group on the Information Society, *supra* note 242.

# ARTICLE

# THE GHOST IN THE MACHINE:[1] MAI SYSTEMS CORP. v. PEAK COMPUTER, INC. AND THE PROBLEM OF COPYING IN RAM

BRADLEY J. NICHOLSON †

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## I. INTRODUCTION

In *MAI Systems Corp. v. Peak Computer, Inc.*,[2] the Ninth Circuit considered a highly significant issue in computer copyright law: whether a software program loaded into a computer's random access memory ("RAM") is a "copy" for purposes of the Copyright Act.[3] Unfortunately, the court viewed the question narrowly, and ignored the statutory purpose of copyright. As a result, the court concluded that the image of a software program in RAM is a potentially infringing "copy." In so doing, the court endowed the copyright owner with a broader bundle of rights than those to which it was entitled. The copyright owner not only gained

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1. John M. Conley & Robert M. Bryan, *A Unifying Theory for the Litigation of Software Copyright Cases*, 63 N.C. L. Rev. 563, 564 (1985) (computer programs are the "ghost in the machine") (citing ARTHUR KOESTLER, THE GHOST IN THE MACHINE (1967)).

† J.D., 1990, University of Pennsylvania Law School.; B.A., 1983, Reed College.

2. 991 F.2d 511 (9th Cir. 1993).

3. 17 U.S.C. § 101 (1988 and 1995 supp.).

copyright protection over the operation of its program in RAM, but also obtained a form of trade secret protection preventing others from reading and using copies of its software.

Contrary to the holding in *MAI*, this article will attempt to show that a software program, when loaded into RAM, should not constitute an infringing copy under the Copyright Act. First, the article will discuss how RAM operates in a computer, and distinguish between temporary memory and permanent storage.[4] Second, it will review the Copyright Act, its legislative history, the views of CONTU,[5] and the cases discussing RAM prior to *MAI*.[6] Third, the article will examine *MAI Systems v. Peak Computer* and its progeny.[7] Fourth, it will analyze *MAI*'s holding and demonstrate that the decision gives unprecedented and unjustified powers to computer copyright owners. In effect, *MAI* gives copyright owners a form of trade secret protection when a copyrighted software program is licensed pursuant to an agreement which prohibits "copying" by unauthorized parties, such as competing computer maintenance organizations.[8] If versions in RAM are defined as copies, these licensing provisions prevent use of the program by third parties which the licensee might hire to work on the licensee's computers. The article concludes that the blurring of the lines between copyright and trade secret by the court in *MAI* may be corrected by finding that loading software into RAM does not create a "copy" for purposes of the Copyright Act, or that if the image in RAM is a "copy," that it is not an infringing one.[9]

## II. THE OPERATION OF RAM IN A COMPUTER

Information in computer software programs consists of a series of positive and negative charges, which represent a binary language called object code.[10] At any particular time, software programs exist in at least one of three places in a computer: loaded into a memory device, residing in storage, or being processed by the central processing unit ("CPU").[11]

The memory devices of most computers are in the form of RAM (random access memory), ROM (read only memory), or a combination of

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4. *See infra* notes 10 to 21 and accompanying text.

5. The National Commission on New Technological Uses of Copyrighted Works, a commission appointed by President Ford to make recommendations for the copyright protection of computer software.

6. *See infra* notes 22 to 58 and accompanying text.

7. *See infra* notes 59 to 91 and accompanying text.

8. *See infra* notes 92 to 110 and accompanying text.

9. *See infra* notes 111 to 164 and accompanying text.

10. Apple Computer, Inc. v. Franklin Computer Corp., 545 F. Supp. 812, 813 (E.D. Pa. 1982), *rev'd on other grounds*, 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

11. *Id.*

both.[12] Both ROM and RAM are integrated circuits, commonly referred to as "chips."[13] Information in RAM consists of evanescent electrical pulses.[14] Information stored in RAM can be changed simply by writing in new information, or erased by turning off the computer.[15] In contrast, the information stored in ROM cannot be changed because it is imprinted when the chip is manufactured and cannot be changed thereafter.[16] Because RAM can be changed or rewritten easily, and will lose all of its information if the RAM chip loses power, it is known as "volatile" memory.[17]

Storage holds information that the computer user does not need immediately, but might need at some time in the future.[18] Instead of integrated circuits, storage consists of magnetic media, usually a floppy disk or a hard disk.[19] Unlike information in RAM, which takes the form of weak, transient electrical pulses, information in storage is more stable, transformed into magnetic charges on the floppy or hard disk.[20] A

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12. Stern Elecs., Inc. v. Kaufman, 669 F.2d 852, 854 n.1 (2d Cir. 1982).

13. ALAN FREEDMAN, THE COMPUTER GLOSSARY 96-97, 374 (1991).

14. *See* WINN L. ROSCH, THE WINN L. ROSCH HARDWARE BIBLE 135-36, 769 (2d ed. 1992).

15. *Stern Elecs.*, 669 F.2d at 854 n.1.

16. *Id.*

17. *Franklin Computer*, 545 F. Supp. at 813. Memory can consist of both dynamic RAM ("DRAM") and static RAM ("SRAM"). Advanced Computer Servs. v. MAI Sys. Corp., 845 F. Supp. 356, 362 (E.D. Va. 1994). While DRAM must be "refreshed" with an electrical charge lest it lose its information, SRAM does not need refreshing; both, however, will lose their information if the power is turned off. *Id.*

18. ROSCH, *supra* note 14, at 766 ("Essentially an electronic closet, mass storage is the place where you put information that you don't want to hold in your hands but don't want to throw away, either.").

19. *Id.*

20. In comparing the stability of magnetic storage with the volatility of memory, one authority writes:

> Magnetic fields have the wonderful property of being static and semi-permanent. On their own, they don't move or change. The electricity used by electronic circuits is just the opposite. It's constantly on the go and seeks to dissipate itself as quickly as possible. The difference is fundamental. Magnetic fields are set up by the spins of atoms that are physically locked in place. Electric charges are carried by mobile particles, mostly electrons, that not only refuse to stay in place but also are individually resistant to predictions of where they are or are going.
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> . . .
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> Despite their different behavior in electronics and storage systems, magnetism and electricity are manifestations of the same underlying elemental force. Both are electromagnetic phenomena. One result of that commonality makes magnetic storage particularly desirable to electronics designers: magnetic fields can be created by the flow of electrical energy. Consequently, evanescent electricity can be used to create and alter semi-permanent magnetic fields just as an all too mortal sculptor can hew a creation that will last for generations.

ROSCH, *supra* note 14, at 768, 769.

computer operates by reading magnetically stored information (in binary code) from permanent storage, translating it into electrical pulses in RAM, and then transferring it to the CPU, which performs the calculations called for by a particular program and relays the answers as necessary to other parts of the system.[21]

## III. THE COPYRIGHT ACT, ITS LEGISLATIVE HISTORY, AND PRE-*MAI* CASE LAW

The Constitution promotes the progress of science and the useful arts by providing an incentive to write literary works and discover inventions.[22] "The purpose of affording copyright protection is to grant valuable rights to authors thereby encouraging the production of literary and artistic works of lasting public benefit."[23] These valuable rights come in the form of a limited monopoly over reproduction of the owner's work, serving "more or less in the nature of a reward for his genius and industry, as well as for the encouragement of others."[24] The primary purpose of copyright, however, is to give the public maximum access to an author's work; rewarding the author is only a secondary consideration.[25] It is for these reasons that the copyright owner has the exclusive right to "reproduce a work in copies," or to distribute the work to the public.[26]

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21. *Franklin Computer*, 545 F. Supp. at 813.

22. The Constitutional basis for copyright and patent law is the Constitution's command to Congress: "To 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.

23. NEIL BOORSTYN, COPYRIGHT LAW 3, § 1.2 (1981).

24. Pearson v. Washingtonian Pub. Co., 98 F.2d 245, 248 (D.C. Cir. 1938), *rev'd on other grounds*, 306 U.S. 30 (1939).

25. Twentieth Century Music Corp. v. Aiken, 500 F.2d 127, 130 n.6 (3d Cir. 1974), *aff'd*, 422 U.S. 151 (1975).

26. Section 106 provides for five exclusive rights:

> Subject to sections 107 through 120, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:
>
> (1) to reproduce the copyrighted work in copies or phonorecords;
>
> (2) to prepare derivative works based upon the copyrighted work;
>
> (3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;
>
> (4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly; and
>
> (5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly.

17 U.S.C. § 106.

The Copyright Act itself sheds little light on the issue of whether a software program in RAM is an infringing copy under the Copyright Act. The Copyright Act defines "copies" as "material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."[27] The Copyright Act then carefully defines the term "fixation": "A work is 'fixed' in a tangible medium of expression when its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."[28]

Unlike the Copyright Act, which makes no mention of RAM, the legislative history of the 1976 Copyright Act alludes to RAM by referring to computer memory.[29] The House Report, which has been highly influential in elucidating copyright law, discussed RAM without mentioning it by name, and concluded that a copy in RAM is not a "copy" for purposes of the Copyright Act. "[T]he definition of 'fixation' would exclude from the concept purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on a television or other cathode ray tube, *or captured momentarily in the 'memory' of a computer.*"[30]

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27. 17 U.S.C. § 101. The Copyright Act defines "device," "machine," or "process," as "one now known or later developed." *Id.* In addition, the 1976 Copyright Act amended Section 102(a) to protect works of authorship which can be reproduced "either directly or with the aid of a machine or device." 17 U.S.C. § 102(a).

28. 17 U.S.C. § 101. The Copyright Act does not define the terms "tangible medium of expression," or "transitory duration."

29. The 1976 Copyright Act included computer programs in the definition of literary works: "'Literary works' are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied." 17 U.S.C. § 101. The House Report accompanying S. 22, which enacted the 1977 version of § 101, opined: "The term 'literary works' . . . also includes computer data bases, and computer programs to the extent that they incorporate authorship in the programmer's expression of original ideas, as distinguished from the ideas themselves." H.R. REP. NO. 1476, 94th Cong., 2d Sess. 54 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5667 [hereinafter House Report]. Original works of authorship, the subject of copyright protection, are defined to include "literary works." 17 U.S.C. § 102(a)(1).

30. House Report, *supra* note 29, at 53, 1976 U.S.C.C.A.N. at 5666 (emphasis added). This comment was made in the context of discussing fixation of live television broadcasts, such as sporting events. *See id.*, 1976 U.S.C.C.A.N. at 5665-66.

Before *MAI*, some commentators thought that the issue was settled: a computer program in RAM did not constitute a copy under the Copyright Act.[31]

Another passage from the House Report deserves mention. In discussing fixation, it states that "[u]nder the bill it makes no difference what the form, manner, or medium of fixation may be—whether it is in words, numbers, notes, sounds, pictures, or any other graphic or symbolic indicia, whether embodied in a physical object in written, printed, photographic, sculptural, punched, *magnetic, or any other stable form*."[32] Two points should be made here. First, storage devices, such as hard disks or floppy disks, are magnetic. RAM, on the other hand, is not magnetic but electronic.[33] Second, magnetic storage is stable,[34] while electronic memory such as RAM is volatile and transient.[35]

Recent amendments to the Copyright Act confirm that copyright protection extends to computer programs.[36] These amendments also permit the users of a computer software program to lawfully make a copy if such a copy is an essential step in the utilization of the computer, or if the copy is for archival purposes.[37] These amendments are the fruit of the

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31. "[A]n image is *not* fixed if it is merely projected on a screen, captured momentarily on the fading phosphors of a cathode ray tube, or stored in the volatile memory of a computer." JAY DRATLER, JR., INTELLECTUAL PROPERTY LAW: COMMERCIAL, CREATIVE, AND INDUSTRIAL PROPERTY § 5.03[1] at 5-67 (1993).

> Although the House Report is not explicit, the word "memory" presumably refers to a computer's volatile random-access memory (RAM), the contents of which are lost when the power is turned off. Other forms of computer memory, such as magnetic storage and read-only memory (ROM), do not lose their contents when power is cut and therefore should be of sufficient permanence to satisfy the definition of fixation. Accordingly, a sentence being written with the aid of a personal computer is not protected by copyright until the moment when the writer or word-processing program first causes it to be recorded on the computer's magnetic hard disk.

*Id.* at 5-67 n.38; *see also* David J. Loundy, *E-Law: Legal Issues Affecting Computer Information Systems and Systems Operator Liability*, 3 ALA. L.J. SCI. & TECH. 79, 125 n.317 (1993) (any information stored in RAM is missing the required element of "fixation" because the data is lost when the computer is turned off); Richard H. Stern, *Section 117 of the Copyright Act: Charter of the Software Users' Rights or an Illusory Promise?*, 7 W. NEW ENG. L. REV. 459, 462-63 & n.22 (1985) (A "computer program in RAM will *not* be fixed; it will simply be a transitory and ephemeral writing, like a message written in sand.... That is not a potentially infringing copy.").

32. House Report, *supra* note 29, at 52, 1976 U.S.C.C.A.N. at 5665 (emphasis added).

33. *See supra* note 14 and accompanying text. Memory, in this discussion, means RAM rather than ROM, since ROM is permanent.

34. ROSCH, *supra* note 14, at 768-69.

35. *See supra* note 17 and accompanying text.

36. 17 U.S.C. § 101 ("A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.").

37. 17 U.S.C. § 117. The full text of § 117 reads:

National Commission on New Technological Uses of Copyrighted Works ("CONTU"), a body appointed by Congress to investigate and comment on the appropriate scope of copyright for computer technology.[38] In the 1976 Copyright Act, Section 117 froze computer copyright standards until Congress had a chance to entertain CONTU's recommendations.[39] In 1978 CONTU released its Final Report and Congress codified most of its recommendations with small but significant revisions.[40]

CONTU took apparent exception to the language in the House Report excluding from the definition of "fixation" reproductions "captured momentarily in the 'memory' of a computer." [41] In response to the House Report, the CONTU Report stated:

> The text of the [Copyright Act of 1976] makes it clear that the placement of a copyrighted work into a computer . . . is the preparation of a copy. . . . Because works in computer storage may be repeatedly reproduced, they are fixed and, therefore, are copies . . . .[42]

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> Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
>
> (1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
>
> (2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.
>
> Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.

38. *See* Pub. L. No. 93-573, § 201, 88 Stat. 1873 (1974) (authorizing CONTU).

39. *See* 17 U.S.C. § 117 note.

40. *See* NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS (1978) [hereinafter CONTU Report]. Congress made one important, and rather puzzling change. While CONTU recommended that the rights set forth in Section 117 accrue to "rightful possessors" of computer software, Congress changed "rightful possessors" to "owners" without any comment, thus excluding lessors of computer software from the scope of the rights granted under § 117. *Compare id.* at 12 *with* 17 U.S.C. § 117.

41. *See supra* note 30 and accompanying text.

42. CONTU Report, *supra* note 40, at 22. The CONTU Report went on to state: "Insofar as a contrary conclusion is suggested in one report accompanying the new law, this should be regarded as incorrect and should not be followed, since legislative history need not be perused in the construction of an unambiguous statute." CONTU Report at 22 n. 111 (citations omitted). *Cf.* House Report, *supra* note 29, at 53 *with* the plain language of the statute defining "fixed."

This statement from the CONTU Report is ambiguous because it refers to computer storage without defining or distinguishing it from memory.[43]

Cases before *MAI* said little about RAM. While a few cases have suggested that loading a program into RAM creates a copy, none of them specifically concluded after a thorough analysis of the law and the facts that a computer program in RAM was an infringing copy under the Copyright Act. Such cases include *Vault Corp. v. Quaid Software Ltd.*,[44] *Bly v. Banbury Books, Inc.*,[45] *ISC-Bunker-Ramo Corp. v. Altech, Inc.*,[46] *Apple*

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43. The degree of weight which CONTU's statements can be given is debatable, because even "the views of a subsequent Congress form a hazardous basis for inferring the intent of an earlier one." United States v. Price, 361 U.S. 304, 313 (1960). This is even more true of the views of a subsequent unelected committee. One court has dismissed the CONTU Report as not possessing the force of legislative history, while other courts have accorded it such status. *Compare* Lotus Dev. Corp. v. Borland Int'l, Inc., 788 F. Supp. 78, 93 (D. Mass. 1992), *rev'd on other grounds*, 49 F.3d 807 (1st Cir. 1995) ("Nor can we attribute to Congress . . . a manifestation of intent drawn from a supposed legislative history arguably appearing in a CONTU report to Congress. . . . [T]here is no support for treating as legislative history what another person or entity say *to* Congress.") *with* Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1252 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984) ("[W]e can consider the CONTU Report as accepted by Congress since Congress wrote into the law the majority's recommendations almost verbatim.") *and* Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 750 n.6 (N.D. Ill. 1983) ("[T]he CONTU Report reflects the Congressional intent.").

44. 847 F.2d 255 (5th Cir. 1988). "Congress amended the Copyright Act in 1976 . . . to establish that a program copied into a computer's memory constitutes a reproduction." *Id.* at 259. This comment, however, was part of a few preliminary remarks about the Copyright Act and appears to have played no role in the court's ultimate conclusion that 17 U.S.C. § 117 preempted the stricter provisions of Louisiana's software licensing law. The court cited no support for its remark other than a reference to § 102(a). *See id.* at 259 n.6 ("Section 102(a) was amended to protect original works of authorship which can be reproduced 'either directly or with the aid of a machine or device.' 17 U.S.C. § 102(a) (1977).").

45. 638 F. Supp. 983 (E.D. Pa. 1986). *Bly*, however, only restates the plaintiff's argument and refuses to consider the matter: "Plaintiff relies on cases which state that loading a program into a computer's memory involves making a copy and therefore constitutes an infringement of a copyright on the program." 638 F. Supp. at 985 (citing Williams Elecs., Inc. v. Arctic Int'l., Inc., 685 F.2d 870, 876-77 (3d Cir. 1982); Micro-Sparc, Inc. v. Amtype Corp., 592 F. Supp. 33, 34-35 (D. Mass. 1984); *Franklin Computer*, 714 F.2d at 1249. ) The court noted that "defendant's concession of liability makes it unnecessary for me to decide this issue." *Id.* It must be noted that two of the cited cases, *Williams* and *Franklin Computer*, are about ROM, not RAM. Furthermore, *Bly* concerns damages, and it appears that defendant conceded liability only because it believed damages were minimal. *Id.* at 984.

46. 765 F. Supp. 1310 (N.D. Ill. 1990). In particular, *Altech* notes:

> Altech's possession of ISC software not only constitutes "contributory infringement," its subsequent use of that software . . . comprises additional acts of direct infringement by Altech. This is because in order to use an ISC software program, the program must be "loaded" into a computer memory. Loading a computer's memory requires "copying" of the program from a disk into memory, and that copy is a direct infringement of the copyright. *Nimmer on Copyright*, § 8.08 (1989).

*Computer, Inc. v. Formula Int'l, Inc.*[47] *Micro-Sparc, Inc. v. Amtype Corp.*,[48] however, deserves scrutiny because it is the only case before *MAI* to devote more than a few sentences to the issue.

In *Micro-Sparc*, the court was required to apply Section 117 to a "typing service."[49] The plaintiff was the publisher of *Nibble* magazine. This magazine published software source code, and purchasers of the magazine were invited to type the programs manually into their computers. The defendant, Amtype, offered a typing service to assist purchasers of the magazine. For a small fee, Amtype sold to magazine purchasers (and only magazine purchasers) a disk which contained all the programs which were printed in that issue of *Nibble*.[50] In order to sell such disks, Amtype had to type the programs onto a master disk, then make floppy disk copies of the master disk. People who purchased *Nibble* were owners of their copy of the software, and Amtype only sold disks to people who had purchased the magazine. The issue was whether the owner of a copy of *Nibble* could authorize Amtype's making of another copy on a disk under Section 117.[51]

The court noted that Section 117(a) provided that a copy could be made "as an essential step in the utilization of the computer program in conjunction with a machine."[52] The court went on to note, based on the CONTU Report, that loading a program into memory entailed the creation of a copy.[53] The court stated that the copy created in the computer's memory could be used to create other copies.[54]

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765 F. Supp. at 1332 (original emphasis omitted). The court goes on to say: "Therefore, whenever Altech uses ISC's copyrighted software, it necessarily makes an unauthorized copy of that software, and necessarily infringes ISC's copyright." *Id.* (citing Bly v. Banbury Books, Inc., 638 F. Supp. 983, 985 (E.D. Pa. 1986) and Micro-Sparc, Inc. v. Amtype Corp., 592 F. Supp. 33, 35 (D. Mass. 1984)). As the preceding footnote points out, *Bly* does not stand for this proposition; rather, plaintiff made this argument, which was conceded in order to get to the issue of damages (which were thought to be minimal). The court's reference to "memory" is somewhat ambiguous, and could mean storage or memory. At any rate, the *Altech* court treated the issue in conclusory fashion.

47. 594 F. Supp. 617 (C.D. Cal. 1984). What little *Franklin Computer* had to say about RAM was quoted in *MAI* and will be set forth below in the discussion of *MAI*. *See infra* notes 59 to 91 and accompanying text.

48. 592 F. Supp. 33 (D. Mass. 1984).

49. *Id.* at 34.

50. *Id.*

51. *Id.*

52. *Id.* (quoting 17 U.S.C. § 117(1)).

53. The opinion stated:

> In our opinion, it refers to the placement of a program into a computer — or, in the jargon of the trade, the "inputting" of it. Inputting a computer program entails the preparation of a copy. 2 Nimmer on Copyright ¶ 8.08. Because one must input a program in order to use it, each use constitutes a potential copyright violation. The legislative history of § 117 indicates to us that subsection (1) was enacted simply to permit the rightful possessor of a program to input and use it:

Despite the reference to computer memory, the court's ruling was based on much narrower grounds. Rather than concluding that the copy in the computer's memory was an infringing copy, the court concluded that the copyright violation was putting the copy of the *Nibble* program on the disks which were distributed to others. Section 117(1) "does not permit a Nibble purchaser to authorize the defendant to put the programs on a disk for him."[55] The offending conduct was that defendant created "a disk copy that the purchaser then uses to input the programs."[56] Hence, the court concluded only that the disk storage copy was an infringement; the reference to RAM was merely dicta.

The court's conclusion is quite reasonable from an economic perspective. In selling *Nibble*, Micro-Sparc was selling software in printed form. Since Micro-Sparc owned the copyright of that software, it was entitled to copy and distribute it for its own economic gain in whatever form it might take, whether printed as source code or copied on magnetic disk.[57] Micro-Sparc was entitled, if it desired, to distribute and sell copies of its software on disk.[58] By copying, then distributing, the software code, Amtype stole Micro-Sparc's sales of *Nibble*'s software on disk. Thus, Micro-Sparc was harmed by Amtype's appropriation of part of the market for its software. A copy which existed solely in RAM, however, would not cause such a market injury. As we shall see, the *MAI* court's conclusion required a significant leap from the holding in *Micro-Sparc*.

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> [T]he placement of a work into a computer is the preparation of a copy. . . One who rightfully possesses a copy of a program, therefore, should be provided with a legal right to copy it *to that extent which will permit its use* by that possessor. This would include the right to load it into the computer.
>
> *Final Report of the National Commission on New Technological Uses of Copyrighted Works* at 31 (emphasis added). For example, subsection (1) permits an owner of Nibble programs, whether in the magazine or on disks, to input and use them, by either manually typing in the programs from the magazine or electronically transferring them in from the disks.

592 F. Supp. at 34-35 (footnotes omitted).

54. The court observed:

> [S]uppose a Nibble program is either typed in manually from the magazine or transferred in electronically from a disk. After the input is complete, the user has two copies of the program. One is contained in either the magazine or the disk; the other is contained in the computer's memory. This second copy can be displayed on the computer's screen, printed on its typewriter, or transferred onto a blank disk.

*Id.* at 35 n.6.

55. *Id.* at 35.

56. *Id.* (emphasis omitted).

57. 17 U.S.C. § 101 ("'Literary works' are works . . . expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, . . . tapes [or] disks . . . in which they are embodied.").

58. For example, it could, and did, include a disk with the magazine along with the printed code. *Micro-Sparc*, 592 F. Supp. at 34.

## IV. *MAI SYSTEMS, INC. v. PEAK COMPUTER, INC.*

*MAI* involved the activities of an independent service organization ("ISO"). Computers, whether they are laptops, personal computers, or mainframes, require some level of maintenance. Such maintenance can include cleaning hard disks, cleaning the inside of the computer case, or replacing electrical connections. Sometimes extraneous data appears in computer data files and must be removed; this is often the result of a "virus."[59] Computer owners often need to add peripheral devices to expand the capabilities of their computers, including adding more or larger CD-ROM drives, hard drives, or floppy disk drives, installing "boards" or "cards" to enhance the performance of monitors, or to add a modem. An ISO can perform some or all of these "upgrading" tasks. Because computer problems may not be obvious through a visual inspection, ISOs must often use software that comes with the computer in order to diagnose and repair problems or install hardware, software, or peripherals. Such software is often called diagnostic software or utilities software. Even after the simplest repair, an ISO may need to start up the computer using the operating system software, the most basic software in the computer, merely to ensure that the computer still operates properly.

ISOs compete in a highly lucrative industry coveted by many computer manufacturers. While ISOs perform some work on personal computers, the bulk of their work concerns computer systems manufactured for certain specialized business applications, such as business accounting and inventorying.[60] Significantly, the manufacturers of such computer systems often sell the hardware outright, but only license the software.[61] The maintenance of such computers is a highly lucrative endeavor, one that the manufacturers want to reserve for themselves.[62] Hence, software licenses often restrict use of the software to

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59. FREEDMAN, *supra* note 13, at 636-37.

60. *See, e.g.*, Triad Sys. Corp. v. Southeastern Express Co., 31 U.S.P.Q.2d 1239, 1240 (BNA) (N.D. Cal. 1994); Advanced Computer Servs. v. MAI Sys. Corp., 845 F. Supp. 356, 358 (E.D. Va. 1994).

61. *See, e.g., Triad Sys. Corp.*, 31 U.S.P.Q.2d at 1241; *Advanced Computer Servs.*, 845 F. Supp. at 360.

62. The nature of the market for service and maintenance for larger business computers is quite different from that of personal computers, with which most lawyers are familiar.

> A personal computer is an electronic gizmo that is built in a factory and then sold by a dealer to an individual or a business. If everything goes as planned, the customer will be happy with the purchase, and the company that makes the personal computer, say Apple or Compaq, won't hear from that customer again until he or she buys another computer. Contrast that with the mainframe computer business, where big computers are built in a factory, sold directly to a business or government, installed by the computer maker, serviced by the computer maker (for a monthly fee), financed by the computer maker, and often running software written by the computer maker (and licensed, not sold, for another monthly fee). The big computer

bona fide employees of the licensee.[63] Such licenses restrain competition in the service market by restricting ISOs' access to software which they must use in order to perform their services.[64]

MAI Systems Corporation originally manufactured computers and wrote its own software. By 1993, however, MAI's business was limited to servicing its computers and software.[65] MAI's software licenses permitted its customers to use the software for their own internal information processing, including loading the software into RAM, but prohibited third parties, such as an ISO, from loading MAI software into RAM.[66]

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company makes as much money from servicing, financing, and programming the computer as it does from selling it. It not only wants to continue to know the customer, it wants to be in the customer's dreams.

ROBERT X. CRINGELY, ACCIDENTAL EMPIRES 35-36 (1992).

63. *See, e.g., Triad Sys. Corp.*, 31 U.S.P.Q.2d at 1241 n.2; *Advanced Computer Services*, 845 F. Supp. at 361 n.6, 367.

64. ISOs are often composed of, or started by, former employees of one of these particular computer manufacturers. *See, e.g.*, MAI Sys. Corp. v. Peak Computer, Inc., 991 F.2d 511, 513 (9th Cir. 1993).

65. MAI had ceased to manufacture computers by the time of the appeal of dispute. *See id.* at 513. The maintenance market for MAI computers therefore probably had assumed a greater importance than before MAI stopped manufacturing.

66. *Id.* at 517. The opinion quoted the following portions of a representative MAI software license:

> 4. Software License.
>
> (a) License. . . Customer may use the Software (one version with a maximum of two copies permitted — a working and a backup copy) . . . solely to fulfill Customer's own internal information processing needs on the particular items of Equipment . . . for which the Software is configured and furnished by [MAI]. The provisions of this License . . . shall apply to all versions and copies of the Software furnished to Customer pursuant to this Agreement. The term "Software" includes, without limitation, all basic operating system software. . . .
>
> (b) Customer Prohibited Acts. . . . Any possession or use of the Software . . . is prohibited, including without limitation, examination, disclosure, copying, modification, reconfiguration, augmentation, adaptation, emulation, visual display or reduction to visually perceptible form or tampering. . . .
>
> (c) Customer Obligations. Customer acknowledges that the Software is [MAI]'s valuable and exclusive property, trade secret and copyrighted material. Accordingly, Customer shall . . . (i) use the Software . . . strictly as prescribed under this License, (ii) keep the Software . . . confidential and not make [it] available to others.

The diagnostics software was covered by a separate agreement. A representative such agreement provided in part:

> 6. Access/Non-Disclosure.
>
> Licensee shall not give access nor shall it disclose the Diagnostics (in any form) . . . to any person . . . without the written permission of [MAI].

Peak Computer was formed in 1990 as an ISO which maintained MAI computers for over one hundred clients in Southern California.[67] MAI sought an injunction preventing Peak Computer from servicing MAI computers.

The district court granted summary judgment and injunctive relief to MAI. The judgment and injunctions prevented Peak Computer, an ISO, from using MAI's copyrighted computer software while engaged in their computer maintenance business.[68] On appeal, the Ninth Circuit ruled that any copying by third parties was outside the scope of the license and was therefore infringing.[69] Though Peak Computer had conceded that in maintaining its customers' computers, it used MAI operating system software "to the extent that the repair and maintenance process necessarily involve[d] turning on the computer to make sure it is functional and thereby running the operating system,"[70] it disputed that its "copying" violated the Copyright Act. In particular, Peak argued that the copy in RAM is not "fixed" for purposes of the Copyright Act.[71]

The court reviewed the Copyright Act's definitions of "copies" and "fixed,"[72] and concluded that the copy in RAM was sufficiently fixed under the Act because Peak failed to adduce facts to prove that the copy in RAM was not fixed.[73] MAI had moved for summary judgment, arguing that once a Peak technician boots an MAI computer and loads the operating software into RAM, the technician is able to view a "system error log" which diagnoses problems in the computer. The court found that this argument proved "that the representation created in the RAM is 'sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.'"[74] Peak failed show that a factual controversy over this

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> Licensee may authorize not more than three (3) of its bona fide employees to utilize the Diagnostics . . . if, and only if, they agree to be bound by the terms hereof.

*Id.* at 517 n.3.

67. Servicing MAI computers comprised between 50 and 70 percent of Peak's business. *Id.* at 513.

68. The preliminary injunction read in part that defendants were enjoined from "infringing MAI's copyrights in any manner and from using, publishing, copying, selling, distributing or otherwise disposing of any copies or portions of copies" of certain specified MAI software. *Id.* at 513. "Use" was defined as "including, without limitation, the acts of running, loading, or causing to be run or loaded, any MAI software from any magnetic storage or read-only-memory [ROM] device into the computer memory of the central processing unit of the computer system." *Id.* at 513-14.

69. *Id.* at 517.

70. *Id.* at 518.

71. *Id.*

72. *See supra* notes 27-28 and accompanying text.

73. 991 F.2d at 518.

74. *Id.*

argument existed, and thus fell into the federal procedural pitfall that a party opposing summary judgment may not rest upon mere allegation or denials but "must set forth specific facts showing that there is a genuine issue for trial."[75] Given this narrow procedural posture, *MAI* arguably stands only for the proposition that a copyright defendant must elicit factual support for arguments in its defense or summary judgment will be granted to the copyright owner plaintiff.

The court went on, however, to establish that a software program loaded into RAM is fixed. The court primarily relied on *Apple Computer, Inc. v. Formula Int'l, Inc.*,[76] which concerned the granting of contempt sanctions against Formula for violating a preliminary injunction forbidding it from copying and selling ROM chips[77] containing Apple software. Formula had argued that Section 117 precluded it from being held in contempt, because the chips were a new copy created as an essential step in the utilization of the Apple computer program in conjunction with a computer, but the court concluded that Section 117 did not condone Formula's activities, because Section 117 applies only to a computer owner's ability to make copies to assist its own use of the software, and Formula was selling the software to others.[78] As an alternative holding, *Apple Computer* found that Section 117 also did not apply because its requirement that the "new copy" be "created as an essential step" in the utilization of the copyrighted program "implies that the type of copying authorized by the statute must be no more permanent than is reasonably necessary."[79] The court found that Formula's method of copying violated that requirement because the purchaser of a diskette desiring to utilize the programs on the diskette could arrange to copy the programs into RAM instead.[80] In other words, copying in ROM was not "essential" because copying into RAM was an alternative. The court in *MAI*, however, drew on the following passage in *Apple Computer* for the proposition that a copy made in RAM is potentially infringing:

> RAM can be simply defined as a computer component in which data and computer programs can be temporarily recorded. Thus, the

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75. *Id.* (quoting Fed. R. Civ. P. 56(e); also citing Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986); Harper v. Wallingford, 877 F.2d 728 (9th Cir. 1989)).

76. 594 F. Supp. 617 (C.D. Cal. 1984).

77. *See supra* note 47 and accompanying text.

78. 594 F. Supp. at 621-22. The pertinent part of Section 117 reads as follows:

> [I]t is not an infringement for the owner of a copy of a computer program to make . . . another copy . . . of that computer program provided:
>
> (1) that such a new copy . . . is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner . . . .

17 U.S.C. § 117 (Supp. 1995).

79. 594 F. Supp. at 622.

80. *Id.*

> purchaser of [software] desiring to utilize all of the programs on the diskette could arrange to copy [the software] into RAM. This would only be a temporary fixation. It is a property of RAM that when the computer is turned off, the copy of that program recorded in RAM is lost.[81]

While the *Apple Computer* court concluded in this alternate holding that encoding a software program into a ROM chip is more permanent than loading it into RAM, the *MAI* court used this language to support its conclusion that RAM copying is fixed and thus constitutes copyright infringement. *Apple Computer*'s reference to fixation, however, was merely a vague assumption.

After quoting from *Apple Computer*, *MAI* concluded: "While we recognize that this language is not dispositive, it supports the view that the copy made in RAM is "fixed" and qualifies as a copy under the Copyright Act."[82] Although the court admitted that it had found no case specifically holding that the copying of software into RAM creates a copy under the Copyright Act, it wrote that "it is generally accepted that the loading of software into a computer constitutes the creation of a copy under the Copyright Act,"[83] referring the reader to *Vault Corp. v. Quaid Software Ltd.*,[84] *Nimmer on Copyright*,[85] and the CONTU Report.[86]

The *MAI* court sounded a nervous note—"[w]e recognize that these authorities are somewhat troubling since they do not specify that a copy

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81. 991 F.2d at 519 (quoting *Apple Computer*, 594 F. Supp. at 622).

82. *Id.*

83. *Id.*

84. *See supra* note 44 and accompanying text.

85. *See supra* note 46 and accompanying text.

86. This is the quote that refers to storage, not RAM. *See supra* notes 41-43 and accompanying text. *MAI*'s reading of the Copyright Act has some basis in CONTU. But while CONTU concluded that a copy in RAM is potentially infringing, it recognized the need to excuse copying by the rightful possessor.

> Because the placement of a work into a computer is the preparation of a copy, the law should provide that persons in rightful possession of copies of programs be able to use them freely without fear of exposure to copyright liability. Obviously, creators, lessors, licensors, and vendors of copies of programs intend that they be used by their customers, so that rightful users would but rarely need a legal shield against potential copyright problems. It is easy to imagine, however, a situation in which the copyright owner might desire, for good reason or none at all, to force a lawful owner or possessor of a copyright to stop using a particular program. One who rightfully possesses a copy of a program, therefore, should be provided with a legal right to copy it to that extent which will permit its use by that possessor. This would include the right to load it into a computer.

CONTU Report, *supra* note 40, at 13. CONTU thus intended that rightful possessors be able to make copies of their programs. The right to copy under CONTU's reasoning should extend to the lawful agents of the rightful possessor as well. Unfortunately, Congress changed "rightful possessors" to "owners" without any explanation. *Supra* note 40.

is created regardless of whether the software is loaded into the RAM, the hard disk or [ROM]"—before concluding that because "the copy created in the RAM can be 'perceived, reproduced, or otherwise communicated,' we hold that the loading of software into the RAM creates a copy under the Copyright Act."[87] The court affirmed the district court's grant of summary judgment and the permanent injunction.[88]

*MAI Systems v. Peak Computer* has been criticized on three main grounds: it failed to consider the doctrine of fair use,[89] ignored the doctrine of copyright misuse,[90] and made only cursory allusion to the computer end-user's rights under Section 117.[91]

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87. 991 F.2d at 519. The court's conclusions regarding RAM were specifically regarding MAI operating system software. But the court made clear that it would have applied its findings to other MAI software if it had been so inclined. MAI's claims were not only concerning its operating system, but its diagnostic software that resided in customers' computers. Peak's field service manager admitted that if Peak loaded MAI diagnostic software into a computer's RAM, such loading would produce the same copyright violation as loading the operating system software. *Id.* at 518 n.4.

88. *Id.* at 519. The court also discussed use of unlicensed software at its own offices (not just in customers' computers located at customers' offices), loaning of MAI computers and software, and trade secret claims. *Id.* at 519-24. These issues are beyond the scope of this article.

89. Trinnie Arriola, *Software Copyright Infringement Claims After* MAI Systems v. Peak Computer, 69 WASH. L. REV. 405, 421-22 (1994); Katrine Levin, Note, MAI v. Peak: *Should Loading Operating System Software Into RAM Constitute Copyright Infringement?*, 24 GOLDEN GATE U. L. REV. 649, 677-80 (1994); *see* 17 U.S.C. § 107. Fair use requires consideration of several nonexclusive statutory factors in deciding whether to allow a plenary defense to copyright infringement. The factors are (1) the purpose and character of use; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work. 17 U.S.C. §107. The final, economic factor is the most important. *See* Stewart v. Abend, 495 U.S. 207, 238 (1990); Harper & Row Publishers, Inc. v. Nation Enters., 471 U.S. 539, 566-67 (1985). In defense of the *MAI* court, it does not appear that the issue was raised.

Courts are often inconsistent and uncertain in applying the fair use doctrine. An author pointed out in 1990 that five of the then-recent leading fair use cases were reversed at every stage of review, and in the Supreme Court's first two encounters with fair use, it split 4-4 each time and failed to resolve anything. Pierre N. Leval, *Toward A Fair Use Standard*, 103 HARV. L. REV. 1105, 1106 n.9 & 1107 n.10 (1990). The trend continues. *See* Acuff-Rose Music, Inc. v. Campbell, 754 F. Supp. 1150 (M.D. Tenn. 1991), *rev'd*, 972 F.2d 1429 (6th Cir. 1992), *rev'd*, 114 S. Ct. 1164 (1994). As Leval notes,

> The opinions reflect widely differing notions of the meaning of fair use. Decisions are not governed by consistent principles, but seem rather to result from intuitive reactions to individual fact patterns. Justification is sought in notions of fairness, often more responsive to the concerns of private property than to the objectives of copyright.

Leval, *supra*, at 1107. The courts have failed to give the doctrine the predictability that the public needs and of which the doctrine is capable. *See generally* Michael G. Anderson & Paul F. Brown, *The Economics Behind Copyright Fair Use: A Principled and Predictable Body of Law*, 24 LOY. U. CHI. L.J. 152 (1993). A fair use analysis of the facts of *MAI*, however, is beyond that scope of this article.

90. Arriola, *supra* note 89, at 425. Copyright misuse involves extending the rights granted under the copyright, usually through contract, so that the use of the copyright

## V. POST-*MAI* CASES

Two cases since *MAI* have considered and followed its conclusions. One case involved MAI Systems and competing ISOs again, this time in the Eastern District of Virginia.[92] Following the publication of *MAI Systems v. Peak Computer*, MAI sent cease and desist letters to various ISOs which competed with MAI for service and maintenance of MAI computers.[93] When the ISOs sued MAI for antitrust claims and requested a preliminary injunction, MAI responded with a copyright infringement counterclaim.[94]

In granting summary judgment to MAI on its copyright counterclaim, the court performed its own analysis of whether loading into RAM constitutes a copy under the Copyright Act, and concluded in the affirmative.[95] The court rejected arguments that the electrical impulses were insufficiently "material" to qualify as an object under the definition of "copies" because the program in RAM takes up RAM space, and because the program in RAM, while imperceptible to the unaided eye, can be perceived "with the aid of a machine or device."[96]

The court rejected the argument that RAM copying failed to meet the fixation requirement. The ISOs argued that because a program in RAM is only captured momentarily in the memory of a computer, it is too transient and ephemeral to meet the fixation requirement.[97] The court rejected the argument, countering that once the program is loaded into RAM, "useful representations of the program's information or intelligence can be displayed on a video screen or printed out on a printer."[98] Hence, the court reasoned, the program in RAM is "stable

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becomes anticompetitive in nature. The leading case allowing the copyright misuse defense is Lasercomb America, Inc. v. Reynolds, 911 F.2d 970 (4th Cir. 1990), in which a manufacturer attempt to extend copyright protection for its product to 99 years. *Id.* at 978-79. Copyright misuse has failed to become commonplace in judicial opinions, although it is often raised by parties in copyright litigation. *See* Ramsey Hanna, Note, *Misusing Antitrust: The Search For Functional Copyright Misuse Standards*, 46 STAN. L. REV. 401, 445 (1994). Again, in defense of the *MAI* court, the issue apparently was not raised. The subject of copyright misuse is beyond the scope of this article.

91. Arriola, *supra* note 89, at 419-20; Levin, *supra* note 89, at 669-77; MELVILLE B. NIMMER, ET AL., NIMMER ON COPYRIGHT, § 8.08[B] at 8-109 (1994). The author believes that Section 117 is not applicable to the facts in *MAI* because of Congress's clear but unexplained change in CONTU's recommendations, altering "rightful possessors" to "owners." It would appear that Peak's customers were not owners of the copies of the software, although they were rightful possessors.

92. Advanced Computer Servs. v. MAI Sys. Corp., 845 F. Supp. 356 (E.D. Va. 1994). The author participated in the briefing of this case as an attorney for the ISOs.

93. *Id.* at 359-60.

94. *Id.*

95. *Id.* at 362-64.

96. *Id.* at 363 (quoting 17 U.S.C. § 102(a)) (emphasis omitted).

97. *See supra* notes 10-21 and accompanying text.

98. 845 F. Supp. at 363.

enough to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."[99]

The court also found, as a factual matter, that the computers in question were turned on for at least several minutes. The court then imagined a hypothetical situation in which a computer is left on for a period of months or years, or for the life of the computer. "In this event, the RAM version of the program is surely not ephemeral or transient; it is, instead, essentially permanent and thus plainly sufficiently fixed to constitute a copy under the Act."[100] The court viewed the problem as one of line drawing, yet did not feel compelled to seek out just where to draw the line between fixed and unfixed.[101] The court found support for its conclusion in *MAI Systems Corp. v. Peak Computer, Inc.*,[102] *ISC-Bunker-Ramo Corp. v. Altech, Inc.*,[103] *Micro-Sparc, Inc. v. Amtype Corp.*,[104] and *Apple Computer, Inc. v. Formula International, Inc.*[105] Finally, the court rejected the contention that copying is a term of art in the computer industry that does not imply that loading into RAM creates a copy, because the Copyright Act, not industry usage, define the scope of copyright protection.[106]

The second case involved Triad Systems Corporation, a computer manufacturer, in its lawsuit against a competing ISO, Southeastern

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99. *Id.* (paraphrasing 17 U.S.C. § 101 (definition of fixation)).

100. *Id.*

101. In particular, the court stated:

> [I]f a computer is turned off within seconds or fractions of a second of the loading, the resulting RAM representation of the program arguably would be too ephemeral to be considered "fixed" or a "copy" under the Act. It is unnecessary here to decide precisely where along the time continuum the line should be drawn between RAM representations of a program that are of a sufficient duration to be "fixed" and those that are not. MAI's copyright infringement claim is not aimed at situations where the power to the computer is turned off and the RAM erased within a second of the completion of loading. Instead, MAI's attack focuses on those situations where the computer is left on for a time measured in minutes, if not longer. . . . In sum, where, as here, a copyrighted program is loaded into RAM and maintained there for minutes or longer, the RAM representation of the program is sufficiently "fixed" to constitute a "copy" under the Act.

*Id.*

102. *See supra* notes 59-91 and accompanying text.

103. *See supra* note 46 and accompanying text.

104. *See supra* notes 48-58 and accompanying text.

105. 562 F. Supp. 775 (C.D. Cal. 1983), *aff'd* 725 F.2d 521 (9th Cir. 1984). This opinion in the dispute between Apple Computer and Formula is not the one cited in *MAI* (*see supra* notes 59-91 and accompanying text), and does not discuss RAM but ROM. *Id* at 777.

106. 845 F. Supp. at 364. The ISOs had pointed out that MAI's own licensing agreements prohibited licensees from "copying" MAI licensed software. *Id.*, *see supra* note 66. This meant that, under *MAI Sys. Corp. v. Peak Computer*, MAI's licensees violate their license with MAI every time they load their software into RAM. 845 F. Supp. at 364.

Express Co.[107] Shortly after the Ninth Circuit decided *MAI*, Triad moved for summary judgment on its copyright claim. The court was bound to follow the teaching of *MAI*, and found that "*MAI* stands for the general proposition that a 'copy made in RAM is "fixed" and . . . a copy under the Copyright Act.'"[108] The court observed that

> [T]he copyright law is not so much concerned with the temporal "duration" of a copy as it is with what that copy does, and what it is capable of doing, while it exists. "Transitory duration" is a relative term that must be interpreted and applied in context. This concept is particularly important in cases involving computer technology where the speed and complexity of machines and software is rapidly advancing, and where the diversity of computer architecture and software design is expanding at an ever-increasing rate.[109]

The court decided that whether an operating system (or other software) made an ephemeral or a permanent copy in RAM in a Triad computer was irrelevant, because it is the "functional equivalent of a longer lasting copy in other computer systems."[110]

In *MAI* the copyright owner achieved something very valuable: the right to exclude ISOs from competing in the market for maintenance and service of computers, where the ISOs could only compete by using the proprietary software residing in the customers' computers. In essence, the copyright owner won the right to prevent, and collect damages for, their customers' disclosure of the copyright owner's computer software to third parties. Granting the copyright owner the right to prevent access and use under the authority of copyright law, however, conflicts with the basic purposes of the Copyright Act.

## VI. ANALYSIS OF *MAI v. PEAK*

*MAI*'s conclusion that loading a program into RAM creates an infringing copy for purposes of the Copyright Act is not convincing. Loading into RAM should not create an infringing copy because such a "copy" is often insufficiently stable to meet the statutory definition. More importantly, however, *MAI* contravenes the purposes of copyright law, because it gives to computer copyright owners broader rights than those enjoyed by other copyright owners. Under *MAI*, computer copyright owners enjoy a powerful combination of trade secret and copyright protection which permits them, for example, to deny third parties access

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107. Triad Sys. Corp. v. Southeastern Express Co., 31 U.S.P.Q.2d 1239 (BNA) (N.D. Cal. 1994). The author also participated in the briefing of this case as one of the attorneys for Southeastern Express.

108. *Id.* at 1243 (quoting *MAI*, 991 F.2d at 519).

109. *Id.* (citing CONTU Report at 22-23).

110. *Id.*

to programs in the possession of licensees and to sue the third parties for operating those programs.

## A. *MAI*'s Dilemma

The terms of the Copyright Act and its legislative history support the proposition that loading a software program into RAM does not create an infringing copy. The key is the definition of fixation. The copy of a software program in RAM should not be viewed as fixed for several reasons. As noted earlier, the electrical impulses in memory chips are "evanescent" in contrast to the magnetically fixed information in storage.[111] RAM, furthermore is not stable but volatile, and cannot survive the loss of power.[112] Storage, on the other hand, is permanent and indubitably represents a "copy" under the Copyright Act.[113]

*MAI* concluded that the image in RAM is "fixed" because a portion of a copy of a program may rest in RAM for some period of time and is perceivable by means of a device. While this is true, such reasoning does not take into account how the computer functions, but considers the computer at rest, when it is essentially idling. Yet the operation of the computer, rather than its state when not in use, is a more realistic view of computer operation. It should dictate whether operation of a software program in RAM is of "transitory duration." When a computer is in operation and commands are being entered, software code may appear in RAM (and disappear from RAM) at high speed. This is consistent with the House Report's conclusion that a temporary appearance of a copy of a computer program in memory is not fixed.[114]

The *MAI* court had several alternative ways to answer the question of fixation. Sometimes versions of software programs in RAM are fixed; this counseled finding that they are "copies." Sometimes these versions are not fixed; this counseled finding that they are not copies. There was a third alternative that *MAI* did not consider: the problem of fixation could be treated as an issue of fact.[115] It is just as well, however, that the court did not consider this alternative, for such an inquiry would require highly

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111. *Compare* House Report, *supra* note 29, at 53 (U.S.C.C.A.N. at 5666) ("[T]he definition of 'fixation' would exclude from the concept purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on a television or other cathode ray tube, or captured momentarily in the 'memory' of a computer.") *with* ROSCH, *supra* note 14, and accompanying text (electrical impulses in RAM memory are "evanescent" but can be made permanent when converted into magnetic storage.)

112. *See supra* notes 10-21 and accompanying text.

113. *See supra* notes 27-28 and accompanying text.

114. *See supra* note 30 and accompanying text.

115. *See* Triad Sys. Corp. v. Southeastern Express Co., 31 U.S.P.Q.2d 1239, 1243 (BNA) (N.D. Cal. 1994).

technical expert testimony about the operation of the computer in question, what parts of the program were used, which portions of code were fixed in RAM, and for how long, and what the nature of damages might be. This would have been an extremely untidy solution that would extend copyright trials, forestall summary judgments, and create greater unpredictability in litigation. *MAI* simply picked a practical alternative, that fixation would be presumed in all cases. But it did so without considering the nature of the rights that it was granting to MAI, and this was its mistake.

### B. *MAI* Created Rights For the Copyright Owner That Go Beyond the Traditional Protection of Copyright

Loading a software program into RAM should not be deemed an infringement. Such an interpretation creates rights broader than copyright protection is intended to afford. *MAI* achieves this unprecedented level of protection by finding that disclosure or use through loading a software program into RAM, when contractually prohibited, amounts to a copyright violation. Unfortunately, *MAI* uses the copyright laws to give a copyright owner the rights of a trade secret owner by creating a method for restricting the disclosure and use of copyrighted works.[116] *MAI* thus creates a copyright violation out of merely reading and using information.[117] By extending the copyright owner's right beyond the scope of a normal copyright, *MAI* federalized

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116. *See, e.g.*, MINN. STAT. ANN. § 325C.01(3) (West 1981 & Supp. 1995) (Minnesota's adoption of the UNIF. TRADE SECRETS ACT, 14 U.L.A. 438 (1985)). Misappropriation of a trade secret is defined as "disclosure or use of a trade secret of another without express or implied consent by a person" who either improperly acquired the secret or had reason to know that it was a trade secret. *Id.* Trade secret status requires that the information derive independent economic value from not being generally known and not readily ascertainable, as well as being the subject of reasonable efforts to maintain its secrecy. MINN. STAT. ANN. § 325C.01(5) (West Supp. 1995). The classic definition is that a "trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it." RESTATEMENT OF TORTS § 757 cmt. b (1939). The trade secret doctrine is used in computer industry to restrict access and disclosure of software. *See, e.g.* WILLIAM S. STRONG, THE COPYRIGHT BOOK: A PRACTICAL GUIDE 24 (1990); *see generally* David Bender, *Protection of Computer Programs: The Copyright/Trade Secret Interface*, 47 U. PITT. L. REV. 905, 921 (1986).

117. This is not to suggest that trade secret protection cannot apply to copyrighted computer software programs, but only that copyright and trade secret misappropriation are two distinct and separate forms of intellectual property protection. *See* Computer Assoc. Int'l, Inc. v. Altai, Inc., 982 F.2d 693, 721 (2d Cir. 1992) ("so long as trade secret law is employed in a manner that does not encroach upon the exclusive domain of the Copyright Act, it is an appropriate means by which to secure compensation for software espionage"). One author thinks that legal theorists have underestimated the important role of trade secret laws in mediating between formal intellectual property regimes and free competition. *See* Jerome H. Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, 94 COLUM. L. REV. 2432, 2438 (1994).

what might otherwise be a contractual matter of confidentiality between the copyright owner/licensor and the licensee.[118] It does so, moreover, without allowing the defendant the benefit of trade secret defenses.[119]

The purpose of copyright law is to secure for copyright owners the right to reproduce copies of their works as a reward to encourage the creation and dissemination of their works and ideas.[120] The intent is to give the copyright owner a royalty for each copy of the work, say, a book. The statutory purpose is no different for computer programs. CONTU evaluated different schemes that might promote the statutory purpose of ensuring creation and broad distribution of computer programs in a competitive market, and concluded that, because the cost of developing computer programs is far greater than the cost of their duplication, they are likely to be disseminated only if "the creator may spread its costs over multiple copies of the work with some form of protection against unauthorized duplication of the work."[121] CONTU did not contemplate a revenue stream to the copyright owner based on use, but on the proliferation of permanent copies.

Copyright law traditionally prohibits copying but encourages disclosure and use. Although a game is copyrighted, there is no copyright violation in playing that game. A painting is copyrighted, but there is no infringement in appreciating its beauty. One may borrow a book, read that book, and give it back to the owner of that copy without incurring copyright liability. Copyright law is not supposed to act as a tool to prevent disclosure and use of copyrighted works. Indeed, the reverse is true: A prime purpose of copyright is to promote dissemination of works.[122] Access to the copyrighted work is at the heart

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118. Trade secret protection is provided exclusively under state law, while copyright is predominantly a matter of federal law. *See, e.g.*, 17 U.S.C. § 301 (1977 & Supp. 1994); CONTU Report at 17; Reichman, *supra* note 117, at 2438 n.13.

119. *See infra* note 146 and accompanying text.

120. *See supra* notes 22-26 and accompanying text.

121. CONTU Report, *supra* note 40, at 11.

122. Campbell v. Acuff-Rose Music, Inc., 114 S. Ct. 1164, 1175 (1994) (creative expression for public dissemination falls within the core of the copyright's protective purposes); Gilliam v. Am. Broadcasting Cos., Inc., 538 F.2d 14, 23 (2d Cir. 1976) ("copyright law should be used to recognize . . . the need to encourage production and dissemination of artistic works"); Harry Fox Agency, Inc. v. Mills Music, Inc., 543 F. Supp. 844, 862 (S.D.N.Y. 1982), *aff'd per curium.*, 779 F.2d 35 (2d Cir. 1985) ("As reflected in the Constitution, the fundamental purpose of the copyright laws is to encourage the production and dissemination of artistic works for the general public good."); *see* United States v. Paramount Pictures, Inc., 334 U.S. 131, 158 (1948) (public interest lies in the general benefits derived by the public from the labors of others); MCA, Inc. v. Wilson, 677 F.2d 180, 183 (2d Cir. 1981) (aim of copyright is to stimulate artistic creativity for public benefit); United States v. LaMacchia, 871 F. Supp. 535, 537 (D. Mass. 1994) ("The limited nature of the property interest conferred by copyright stems from an overriding First Amendment concern for the free dissemination of ideas."). *See generally* L. Ray Patterson, *Free Speech, Copyright, and Fair Use*, 40 VAND. L. REV. 1 (1987).

of the public benefit of dissemination.[123] When copyright law is used to restrict access to a work, rather than promote dissemination, the protection of copyright should no longer apply because such a restriction is beyond its purpose.[124]

Courts have emphasized that promoting access to computer programs is part of the public policy concern inherent in providing copyright protection to computer programs.[125] Programmers, for example, should be free to view the operation, if not to read the source code, of copyrighted programs and use the ideas embodied in them in preparing their own works without appropriating protected expression.[126] Yet, according to *MAI*, accessing and using a computer program on the computer of the rightful possessor of a licensed program is copyright infringement. *MAI* thus inhibits dissemination of works, contrary to copyright policy, because it allows restrictions on access and use based on copyright liability.

The dilemma of *MAI* lies partly in the nature of computer architecture, computer memory, and the information encoded in software programs. The statutory contradiction arises when in order to gain access to and use a copyrighted work one must "copy" the work. Copying, in this case, is not something distinct from access to and use of the work, it *is* access to and use of the work. When "copying" is the only means of access, it should not be punished as a copyright infringement.[127] As

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123. *See, e.g.*, Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832, 842-43 (Fed. Cir. 1992); *see also* Dennis S. Karjala, *Copyright, Computer Software, and the New Protectionism*, 28 JURIMETRICS J. 33, 56-57 (1987).

124. As the United States Supreme Court has observed:

> Creative work is to be encouraged and rewarded, but private motivation must ultimately serve the cause of promoting broad public availability of literature, music, and the other arts. 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. "The sole interest of the United States and the primary object in conferring the monopoly," this Court has said, "lie in the general benefits derived by the public from the labors of authors." When technological change has rendered its literal terms ambiguous, the Copyright Act must be construed in light of this basic purpose.

Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1972) (citations and footnotes omitted).

125. *See* Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510, 1526 (9th Cir. 1992); *Atari Games*, 975 F.2d at 842-43.

126. *See, e.g.*, CONTU Report, *supra* note 40, at 20; Karjala, *supra* note 123.

127. *Cf. Sega Enters.*, *supra* note 125, at 1514 (In discussing a trademark image that would appear as a result of gaining access to a computer program, the court noted that "when there is no other method of access to the computer that is known or readily available to rival cartridge manufacturers, the use of the initialization code by a rival does not violate the [Lanham] Act even though that use triggers a misleading trademark display.").

noted above, *MAI*'s holding is analogous to creating copyright liability for reading a book.

The other part of *MAI*'s dilemma lies in the MAI software license and its ability to exploit the "copying" of a software program into RAM in order to create a potential cause of action against third parties for reading and using the software.[128] The combined effect of "copying" into RAM and the ability to set the terms of license restrictions gives a software copyright owner the ability to sue third parties for copyright infringement when all that the third party has done is assist a rightful possessor of the software by servicing its computer.[129] *MAI* gives the software copyright owner the ability to sue under the copyright law for disclosure and use, so long as it has tailored its software licenses to exclude potential competitors from using its software. In this manner, *MAI* gives software manufacturers a way to regulate use of their software as a trade secret under the auspices of copyright law.[130]

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128. The anticompetitive effects in *MAI* stemmed in part from MAI's leasing rather than selling of the computer program. Leasing combined with maintenance can be very lucrative for the copyright owner which sells hardware, leases software, and charges a monthly fee for service. *See supra* notes 60-64. A number of cases have noted the anticompetitive effect of leasing. *See, e.g.*, Hanover Shoe, Inc. v. United Shoe Mach. Corp., 392 U.S. 481, 483-87 (1968); United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 343 (D. Mass. 1953), *aff'd per curiam*, 347 U.S. 521 (1954). Indeed, when the limited copyright monopoly is used to gain control of a market other than one for the copyrighted product, such facts may suggest that some form of monopoly leveraging and copyright misuse may be taking place. For the problems created by extending copyright protection through use of licensing agreements, see David A. Rice, *Licensing the Use of Computer Program Copies and the Copyright Act First Sale Doctrine*, 30 JURIMETRICS J. 157 (1990); Thomas Lee Hazen, *Contract Principles as a Guide for Protecting Intellectual Property Rights in Computer Software: The Limits of Copyright Protection, The Evolving Concept of Derivative Works, and the Proper Limits of Licensing Arrangements*, 20 U. C. DAVIS L. REV. 105, 142-57 (1986). Professor Rice questions whether breach of a clause in a licensing agreement should be treated as copyright infringement; such terms are usually a means of circumventing the terms of the Copyright Act, including, of course, the first sale doctrine, 17 U.S.C. § 109(a), which limits the seller's ability to impose restrictions. *See* David A. Rice, *Public Goods, Private Contract and Public Policy: Federal Preemption of Software License Prohibitions Against Reverse Engineering*, 53 U. PITT. L. REV. 543, 559-60 & n.56 (1992).

129. It should be noted that the rule in *MAI* prevents third parties from assisting rightful possessors of computer software. Such third parties might include not only the ISOs in *MAI*, but also consultants to the business of the rightful possessor of a licensed software program, including accountants, bookkeepers, temporary secretaries, or word processors.

130. CONTU recognized that trade secret protection can be more anticompetitive than copyright. The CONTU report analyzed the differing scopes of intellectual property protection, and concluded that copyright is the least anticompetitive:

> Patents are designed to give inventors a short-term, powerful monopoly in devices, processes, compositions of matter, and designs which embody their ideas. The doctrine of trade secrecy is intended to protect proprietors who use a "formula, pattern, device or compilation of information" in their business "which gives [them] an opportunity to obtain an advantage over competitors who do not know or use it." . . . Each of these forms of

Several federal courts, however, have disallowed the leveraging of copyright law to establish trade secret protection over software in the area of decompilation or disassembly of computer programs.[131] Decompilation is a step in the reverse engineering of software, analyzing an existing program to create a compatible or competing software program.[132] The legality of decompilation of software, whether such decompilation is characterized as for research purposes, for creating compatible add-on programs, or for creating wholly competing software programs has been the subject of debate for some time. Decompilation of software is a form of copying that has been characterized as "intermediate" in nature, because the aim of legitimate decompilation is to analyze the program rather than proliferate and distribute verbatim copies.[133] Some have suggested that the text of the Copyright Act rejects any general freedom to decompile.[134] "If however, one considers that the purpose of copyright is to promote the creation and dissemination of knowledge, it will follow that . . . if decompilation is necessary in order to get access to knowledge, it should be noninfringing."[135] Claiming that the intermediate copy is an infringing one, some software manufacturers have attempted to use the rubric of copyright law to deny access to those who wish to understand the workings of their software. This is an excellent example of leveraging copyright into trade secret protection.[136]

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> protection may inhibit the dissemination of information and restrict competition to a greater extent than copyright.

CONTU Report, *supra* note 40, at 16 (footnote omitted).

131. *See Sega Enters.*, *supra* note 125.

132. For an overview of this subject, see Betsy E. Bayha, *Reverse Engineering of Computer Software in the United States, The European Union and Japan*, Address before ALI-ABA Conf. on Intellectual Property Claims in High Technology Markets (January 26-27, 1985), and Andrew Johnson-Laird, *Software Reverse Engineering in the Real World*, 19 U. DAYTON L. REV. 843 (1994).

133. *See Sega Enters.*, *supra* note 125, at 1518-19.

134. *See, e.g.*, Arthur R. Miller, *Copyright Protection for Computer Programs, Databases and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 978, 1014-17 (1993); Allen R. Grogan, *Decompilation and Disassembly: Undoing Software Protection*, 1 COMPUTER LAW. 1, at 9 (Feb. 1984).

135. Pamela Samuelson, *Fair Use for Computer Programs and Other Copyrightable Works in Digital Form: The Implications of* Sony, Galoob *and* Sega, 1 J. INTELL. PROP. L. 49, 96 n. 196 (1993) [hereinafter Samuelson, *Fair Use for Computer Programs*]; *see generally* Brief Amicus Curiae of Eleven Copyright Law Professors, Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992) (No. 92-15655), reprinted in 33 JURIMETRICS J. 147 (1992).

136. Pamela Samuelson, et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2390 n.328 (1994). Professor Samuelson observes:

> The real concern of those who oppose decompilation of computer programs . . . is that much of the value in a computer program lies in the applied know-how embodied in it. Much of this know-how cannot be discerned by watching the executable version of the program in operation. As long as the program is not decompiled, the applied know-how embodied in it can successfully be claimed as a trade secret. If someone can get access

Several federal courts have employed the copyright fair use doctrine to find that the use in question was fair, effectively denying the use of copyright to obtain trade secret protection.[137] In circumstances such as those in *MAI*, courts should also deny the copyright owner's attempt to leverage copyright into trade secret protection in order to prevent use of the software.

The reasons for seeking copyright protection to vindicate trade secret concerns are manifold.[138] If one can achieve the same end result, copyright offers numerous advantages over trade secret protection. These advantages include: (1) certain access to federal courts arising from exclusive federal jurisdiction;[139] (2) readily available injunctive relief and nationwide service of such an injunction;[140] (3) the impounding and destruction of infringing materials;[141] (4) damages measured by the plaintiff's lost profits as well as the defendant's profits;[142] (5) statutory damages if actual damages are difficult to prove;[143] (6) recovery of costs and attorney's fees;[144] and (7) the threat of criminal prosecution for willful infringers.[145] In addition, a copyright infringement lawsuit (even if it seeks trade-secret level protection) is not amenable to trade secret defenses, *e.g.*, that the plaintiff inadequately protected the confidential status of its claimed trade secret.[146] Indeed, copyright infringement is far

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> to the know-how through decompilation, the know-how can no longer be a secret (at least as to that person). Nor can it be regarded as expression for copyright purposes nor as an invention under patent law. The goal of those who have opposed decompilation has been a prophylactic one, to use copyright to stop intermediate copying that threatens to destroy the trade secret status of applied know-how embodied in programs.

Samuelson, *Fair Use for Computer Programs*, *supra* note 135, at 96-97.

137. *See* Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510, 1527 (9th Cir. 1992) ("We conclude that where disassembly is the only way to gain access to the ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, as a matter of law."); Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 932, 942-43 (Fed. Cir. 1992) ("Reverse engineering object code to discern the unprotectable ideas in a computer program is a fair use.").

138. Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection For Computer Programs In Machine-Readable Form*, 1984 DUKE L.J. 663, 718 (setting forth the list that follows) [hereinafter Samuelson, *CONTU Revisited*].

139. 28 U.S.C. § 1338(a).

140. 17 U.S.C. § 502.

141. 17 U.S.C. § 503.

142. 17 U.S.C. § 504(a) & (b).

143. 17 U.S.C. § 504(c).

144. 17 U.S.C. § 505; *cf.* MINN. STAT. ANN. § 325C.04 (West 1981 & Supp. 1995) (finding of bad faith required for award of attorney's fees under trade secret statute).

145. 17 U.S.C. § 506.

146. *See, e.g.*, MINN. STAT. ANN. § 325C.01(5) (West 1981 & Supp. 1995) (failure to maintain reasonable efforts to ensure secrecy is a defense to a trade secret misappropriation claim).

easier to prove than trade secret misappropriation, because a copyright plaintiff need not prove that the defendant knew that the item was improperly acquired.[147]

*MAI*'s approach extends trade secret-like protection beyond that of actual trade secrets in one important way. A trade secret loses its status as a trade secret when it is publicly disclosed. By contrast, copyright provides protection regardless of public disclosure. This protection lasts, for an individual, fifty years after the death of the owner, or for a corporation, 100 years from creation of the work or seventy-five years from publication.[148] Leveraging a trade secret into a copyright claim means that the copyright owner's cause of action to prevent disclosure and use will not end upon disclosure, and that the "trade-secret" copyright claim may still be viable a century after its creation.[149]

Depriving copyright owners of the *MAI* cause of action does not destroy any legitimate incentive to create new works. Although preserving royalties for the copyright owner is a major aim of copyright law, a RAM copy need not be deemed infringing in order to preserve sufficient compensation to the copyright owner to ensure an incentive to create.[150] This is because the copy or image in RAM is not a potentially "harmful" copy that might undermine the market value of the copyrighted work.[151] The distinction between "memory" and "storage" is crucial in this regard. The copy in RAM is fragile; RAM is called "volatile" memory because information stored in it cannot survive the loss of power.[152] Because of the fragile nature of the RAM copy, the existence of this copy does not suppress demand for additional copies of the work.[153] The single image in RAM will be used for its task, then the

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147. Compare the elements of copyright infringement in *MAI*, 991 F.2d at 511 (ownership of the copyright and copying beyond the scope of a license) with, *e.g.*, MINN. STAT. ANN. § 325C.01 (West 1981 & Supp. 1995) (manifold elements of trade secret misappropriation under the Uniform Trade Secrets Act).

148. *See* 17 U.S.C. § 302.

149. *See* Samuelson, *CONTU Revisited*, *supra* note 138, at 719.

150. *See supra* notes 122-124 and accompanying text.

151. *See, e.g.*, Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417 (1984) (home video recording of a televised recording does not lessen the commercial value of the work and therefore does not infringe the copyright). Fair use recognizes the significance of the distinction between harmful and harmless copying. *See* 17 U.S.C. § 107(4). Indeed, the most important consideration in a fair use analysis is the effect of the use on the potential market for or value of the copyrighted work. 17 U.S.C. § 107(4); Stewart v. Abend, 495 U.S. 207, 238 (1990); Harper & Row Publishers, Inc. v. Nation Enters., 471 U.S. 539, 566-67 (1985).

152. *See supra* note 17 and accompanying text.

153. Loading into RAM also may be of such limited duration, or otherwise of such insignificant actual injury, as to justify holding for the defendant under the principle of *de minimus non curat lex*. *See Sony*, *supra* note 151, at 451 n.34 (1984); Knickerbocker Toy Co. v. Azrak-Hamway Int'l, Inc., 668 F.2d 699, 703 (2d Cir. 1982); 3 MELVILLE B. NIMMER ET AL., NIMMER ON COPYRIGHT § 13.05[A] at 13-102.49 n.25.3 (1993).

user will inevitably leave the program to use another program, or turn the computer off.[154] A copy in storage would more likely displace demand for the copyrighted work because it is permanent and may foreclose a sale or lease.[155] In such a case, the copyright owner would be deprived of the revenue from sale or lease of the copyrighted work. By contrast, the image in RAM is destroyed when use is finished, and all that remains is the rightful possessor's copy of the program in his or her computer storage. To the extent that *MAI*-granted rights preserve a monopoly over the service market for a particular computer, these rights are illegitimate.

Hence, *MAI*'s protection of disclosure and use is not necessary to deem the RAM copy an infringing copy in order to preserve for the copyright owner an incentive to create new works. The copyright owner receives all the revenue to which it is entitled when it receives license fees and sales revenue for selling or leasing copies of the program in a storage format.[156] While the copyright owner might object that it loses potential revenue from licensing ISOs to use its software, the copyright owner should not be entitled to exclude third parties from using its software, so long as no harmful copying occurs.

Finally, as suggested above, courts may reasonably find that the image in RAM is not a copy because it is often not "fixed."[157] But this is not the only route by which the image in RAM may be deemed not a "copy." The Copyright Act charges that copying which implicates processes or methods of operation is not infringement.[158] In the circumstances discussed here, when copying is the only method for perusing a copyrighted work, then use is closely related to process and method of operation. Copyright cannot protect the process of using a

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154. The copy is lost unless, of course, it is copied into computer storage, i.e., a floppy disk or a hard drive. An individual could borrow a copy on a floppy disk and load that copy into RAM as an intermediate step in copying that program into that individual's own computer storage. A copy transferred to computer storage can also be sold or given to someone else in violation of the distribution right. *See* 17 U.S.C. § 106. Giving or selling the disk would infringe on the copyright owner's distribution right, as well as, in *MAI*'s view, the right to "copy" the work. *See id.*

155. *Cf. Sony , supra* note 151 (permitting copying without infringement liability when such copying—videotaping television programs—was in the nature of storage rather than memory).

156. This would restore computer copyright owners to the same rights as other copyright owners. The owner of a copyright in a book, for example, receives revenue from the sales of the book. The owner of a copyright in a book does not, *under copyright law*, acquire the right to an additional revenue stream for the privilege of reading the book.

157. *See supra* notes 27-28 and accompanying text.

158. 17 U.S.C. § 102(b) ("In 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.").

program, only the duplication and proliferation of that program.[159] Use of a process, system, or method of operation does not amount to a copyright infringement.[160] Under the facts of *MAI*, copying is part of the process of accessing, or the method of operating, the software program. For this reason, copyright protection should not reach that process or operation of the otherwise protected computer software.

In sum, *MAI* permits use of copyright to create a trade secret cause of action against a third party who is not allowed to assert trade secret defenses in response. In creating this hybrid cause of action, *MAI* federalized computer trade secret law by creating a federal claim for disclosure and use of computer programs.

## VII. CONCLUSION

This article has argued that loading a software program into RAM should not be deemed to create a potentially infringing copy in the face of licensing restrictions which seek to impose a trade-secret-like scheme through use of copyright doctrine. This article questions the soundness of *MAI*'s conclusion that the image in RAM is a copy. Courts may avoid *MAI*'s unprecedented extension of copyright doctrine by finding that there is no copy, or by finding that the image in RAM is a noninfringing copy.

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159. Compare the following remarks:

> The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book. . . . [T]he teachings of science and the rules and methods of useful art have their final end in application and use; and this application and use are what the public derive from the publication of a book which teaches them. . . . 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.

Baker v. Selden, 101 U.S. (11 Otto) 99, 103-05 (1879). In *Baker*, the Supreme Court held that one could not use or discuss the bookkeeping system explained in the plaintiff's book without reproduction of the ruled lines and headings inherent in that system. *Id.* at 104. The charts were absolutely necessary to understanding and using the bookkeeping system, just as loading a software program into RAM is necessary to understanding and use of the program. The charts were simply the method of operation for the bookkeeping system; loading into RAM is the method of operating a software program. For this reason, *MAI* runs afoul of *Baker* and its codification in 17 U.S.C. § 102(b).

160. *See* Lotus Dev. Corp. v. Borland Int'l, Inc., 49 F.3d 807, 816 (1st Cir. 1995) (if otherwise protectable forms of expression in a computer program, e.g., the use of certain words, "are essential to operating something, then they are part of a 'method of operation' and, as such, are unprotectable.").

Since copyright is a statute-based grant of rights pursuant to constitutional authority, a legislative solution would be desirable.[161] Section 101 of the Copyright Act could be clarified to state that the image in RAM is not a copy.[162] Alternatively, Section 117 might be modified to state that loading a software program into RAM into the computer of the "rightful possessor" (as CONTU's language originally proposed) does not create an infringing copy.[163] While such a revision might resolve the ambiguity over the kind of copying at issue in *MAI*, it probably would do little to resolve the controversy over RAM copying in connection with the Internet, for example.[164] Statutory clarification could go far to relieve the confusion over copying in RAM.

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161. *See* U.S. CONST. art. I, § 8, cl. 8; 17 U.S.C. § 101 *et seq.*

162. 17 U.S.C. § 101.

163. 17 U.S.C. § 117. Such legislation has been proposed in the House of Representatives by Congressman Joseph Knollenberg of Michigan. *See* H.R. No. 533, 104th Cong., 1st Sess. (1995). Under such revisions, it is possible that contrary licensing provisions based on state law would be considered preempted by contrary federal copyright law. *See* 17 U.S.C. § 301. *See generally* Peter A. Luccarelli, Jr., *The Supremacy of Federal Copyright Law Over State Trade Secret Law For Copyrightable Computer Programs Marked With a Copyright Notice*, 3 COMPUTER/LAW J. 19 (1981).

164. *See, e.g.*, Niva Elkin-Koren, *Copyright Law and Social Dialogue on the Information Superhighway*, 13 CARDOZO ARTS & ENTERTAINMENT L.J. 345, 353-55, 383-86 (1985).

# BRIEF AMICUS CURIAE

## APPLYING FUNDAMENTAL COPYRIGHT PRINCIPLES TO LOTUS DEVELOPMENT CORP. v. BORLAND INTERNATIONAL, INC.*

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PETER S. MENELL ††

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## I. INTRODUCTION

*Lotus v. Borland* raises the fundamental question of whether, and to what extent, the copyright in a computer program protects the user interface generated by that program. Lotus owns the copyright in and markets the very popular spreadsheet program known as Lotus 1-2-3. Borland produced and marketed a competing set of spreadsheet programs known as Quattro. Borland designed and implemented in program code its own user interface, as to which no claim of infringement was made. In addition, however, the Borland programs included a Lotus "emulation mode," which allowed users familiar with the Lotus program more easily to make the switch to Quattro. That is, when operating

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* This article is based on a *Brief Amicus Curiae* filed by the authors with the First Circuit Court of Appeals in Lotus Dev. Corp. v. Borland Int'l, Inc. The decision is reported at 49 F.3d 807 (1st Cir. 1995). The *High Technology Law Journal* publishes this brief in nearly the same form as submitted to the court—this version contains a short introduction added by the authors as well as minor changes made to conform to law review style.

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Quattro in the Lotus emulation mode, the Borland program presented to the user the same hierarchy of menu commands as Lotus 1-2-3 and responded identically to those commands. Lotus brought action for copyright infringement based on the similarity of the Quattro user interface when operated in the emulation mode. No copying of program code was alleged.

The federal district court concluded that the Lotus 1-2-3 user interface as a whole, as well as specific elements of the interface, were copyright protected as nonliteral aspects of the underlying Lotus 1-2-3 computer program.[1] The court based its finding of infringement on the copying of "menu commands, menu command structure, macro language, and keystroke sequences."[2] The district court's reasoning was based largely on the merger doctrine: Because a wide variety of formats and methods of operation are possible for spreadsheet programs, any given set of choices could be copyright protected without hindering the development of other spreadsheet programs. The court essentially ignored functionality as a limit on copyright protection.

The authors of this brief are law professors at Arizona State University and the University of California (Berkeley), respectively, who teach and write on copyright issues, and specifically on the proper application of copyright law to the protection of computer software.[3] We submitted our views on what we perceive to be the crucial issue in this case to the court of appeals because we believe that the district court fundamentally misconstrued both the traditional copyright principles applicable to the facts and the role played by copyright in the overall system of intellectual property protection in the United States. As a result, the district court decision effectively overrules the Supreme Court's decision in *Baker v. Selden*,[4] a decision that for over 100 years has served to demarcate the boundary between the patent and copyright regimes. The result of the district court's decision is to extend copyright protection far beyond its traditional bounds. We believe that Congress is the only body authorized to make such an expansion of copyright protection, and therefore urged the court of appeals to reverse the district court's decision.

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1. Lotus Dev. Corp. v. Borland Int'l, Inc., 799 F. Supp. 203 (D. Mass. 1992). An earlier opinion in the case appears at 788 F. Supp. 78 (D. Mass. 1992).

2. 799 F. Supp. at 222.

3. We represented no party to the litigation nor did we act on behalf of any person other than ourselves. We offered our views to the First Circuit Court of Appeals in the spirit of pro bono publico.

4. 101 U.S. 99 (1879).

## II. ISSUE IN THE CASE

Properly viewed, *Lotus v. Borland* does not involve any issue of the copyright protection of computer programs. Rather, it involves the application of traditional copyright law to the *products* of programs —those "certain results" produced by the combinations of statements or instructions that comprise computer programs. The issue in the case is whether functional aspects of these products, traditionally protected solely by patent or trade secret law under the doctrine of *Baker v. Selden* should now be brought under the copyright umbrella. Stated otherwise, the issue is whether the particular spreadsheet format and methods of operation that constitute the user interface of the Lotus 1-2-3 computer program should be protected for the 75-year term of copyright solely on the ground that a variety of other spreadsheet formats and methods of operation are possible, or whether unpatented aspects of this technology should be permitted to progress unencumbered and incrementally through the cumulative efforts of many spreadsheet developers.

## III. SUMMARY OF ARGUMENT

The argument that Borland has the right to create an independently written computer program that brings about the same results as the Lotus 1-2-3 computer program is two-fold: First, the statutory definition of a program distinguishes between the program instructions and what those instructions do—the "certain results" they bring about—when they are executed by a computer. The copyright in the program does not extend to the "certain results" brought about by the program. If those "certain results" are to be copyright protected, they must independently qualify as works of authorship.

Second, even if aspects of the Lotus 1-2-3 user interface qualify as works of authorship independently of the underlying computer program—for example, as graphic or audiovisual works—the traditional limits on the scope of any copyright in that interface still apply. These limits include not only the copyright doctrines of merger and scènes á faire but also the foundational doctrines of *Baker v. Selden* and section 102(b) of the Copyright Act. These doctrines exclude function from the scope of copyright protection. The policies underlying that tradition are and always have been firmly grounded in the fundamental allocation of protection established by the intellectual property system as a whole. Each of the intellectual property regimes—copyright, patent, trademark, and trade secret—must be understood in the context of this larger system and cannot be interpreted in isolation. Moreover, only Congress, and not the courts, has authority to expand the scope of the intellectual property laws. Because we are addressing an asserted independent copyright in the outputs generated by the Lotus 1-2-3 program and not the program

code itself, protection of functional features of the user interface are not governed by Congress' decision to protect some aspects of program code under copyright. This case centers on the interpretation of *traditional* copyright principles applied to visual images and systems for processing data, and absent instructions from Congress to the contrary, courts must adhere to the doctrines reflected in the Copyright Act and the case law interpreting the intellectual property statutes.

## IV. ARGUMENT

### A. Copyright in a Program Does Not Extend to those "Certain Results" Brought about by Program Execution[5]

Under the United States Copyright Act, a computer program is "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."[6] Unless the "certain result" effected by a program is independently protected under copyright law, anyone has the right to produce independent code bringing about even an identical result.[7] Even one of the strongest proponents of broad copyright protection for programs agrees that third parties are "free to emulate all external aspects of the program" without infringing the copyright.[8] It is widely recognized, and not questioned in the *Lotus* case, that different computer programs can generate identical outputs. Therefore, even identity of unprotected output in no way establishes infringement of the underlying program.[9]

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5. Our brief discusses an issue not directly addressed in a *Brief Amicus Curiae of Copyright Law Professors* filed in the *Lotus* case (*reprinted in* 16 HASTINGS COMM. & ENT L.J. 657 (1994)), namely, whether a copyright in a program extends to a user interface generated by execution of program instructions. We concur with that brief's conclusions, first, that the district court failed to engage in proper analysis under *Baker v. Selden* and, second, that insofar as the court of appeals chooses to regard user interfaces as nonliteral elements of programs covered by a program copyright, the district court misapplied the test of Computer Assocs. Int'l, Inc. v. Altai, 982 F.2d 693 (2nd Cir. 1992).

6. 17 U.S.C. § 101 (1988) (definition of "computer program").

7. NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 21 (1979) [hereinafter CONTU Report] ("One is always free to make the machine do the same thing as it would if it had the copyrighted work placed in it, but only by one's own creative effort rather than by piracy.").

8. Duncan M. Davidson, *Common Law, Uncommon Software*, 47 U. PITT. L. REV. 1037, 1080 (1986).

9. In fact, to the extent that a specific piece of code is the only way of bringing about some aspect of this "certain result", one of only a few practical ways of doing so, or an obvious or standard way of doing so from the point of view of an experienced programmer, even that specific piece of *code* is not protected, and a finding of infringement cannot be based on similarities in these aspects of the code.

> [C]opyright protection for programs does not threaten to block the use of ideas *or program language previously developed by others when that use is*

This straightforward conclusion—that what a program *does*, and therefore its "appearance" to the outside world when viewed solely through input and output devices, is not protected by the copyright in the program—comports with well over 100 years of copyright tradition and was explicitly recognized by the Second Circuit in *Computer Associates International, Inc. v. Altai*:[10]

> [W]e note that our decision here does not control infringement actions regarding categorically distinct works, such as certain types of screen displays. These items represent products of computer programs, rather than the programs themselves, and fall under the copyright rubric of audiovisual works.[11]

Therefore, the analysis of *Computer Associates* and other cases addressing the scope of copyright protection for nonliteral elements of program code simply does not address the central issue of *Lotus v. Borland*: the scope of protection for computer program outputs. The scope of such protection is circumscribed by all of copyright's traditional limiting doctrines and is not affected by the 1980 amendments to the Copyright Act recognizing the protection of computer programs—sets of statements or instructions—under copyright.[12]

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> *necessary to achieve a certain result.* When other language *is* available, programmers are free to read copyrighted programs and use the ideas embodied in them in preparing their own works . . . .

CONTU Report, *supra* note 7, at 20 (first emphasis added). This also follows, of course, from the filtering procedure called for by Computer Assocs. Int'l, Inc. v. Altai, 982 F.2d 693 (2nd Cir. 1992).

10. *Computer Assocs.*, 982 F.2d at 703.

11. *Id.* For a more detailed explication of the distinction between a computer program and its user interface, including some of the early judicial and administrative errors in addressing the issue, see 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, 264-69 (Appendix) (1992).

12. The issues raised by this case have confounded other courts as well. In both Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986) and Digital Comm. Assocs. v. Softklone Distrib. Corp., 659 F. Supp. 449 (N.D. Ga. 1987), district courts made a similar analytical mistake as the district court in *Lotus* in applying copyright law to the outputs of computer programs. As with Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37 (D. Mass. 1990), these cases were not appealed. Therefore, the First Circuit will be the first appellate court to address the question of copyright protection for interfaces of this type.

Even if a court were to approach the issue of copyright protection for interfaces as a part of the copyright in the underlying program, it is clear that what a computer program does—the screen displays it generates and the methodology it presents to the outside world for using the program via such devices as keyboards and data entry formats—lies at a higher level of abstraction above literal code than even program structure and organization. The recognition of protection for so-called "structure, sequence, and organization" or "SSO" by the Third Circuit in Whelan, Inc. v. Jaslow Dental Laboratory, Inc., 797 F.2d 1222, 1248 (3rd Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987) caused great controversy, and *Computer Associates* explicitly reduced the breadth of *Whelan*. *See, e.g., Computer Assocs.*, 982 F.2d at 711-12 (noting that Feist Pubs., Inc. v. Rural Tel. Serv. Co., 111 S. Ct. 1282 (1991), implicitly undercuts the *Whelan* rationale and citing with approval

## B. The Critical Relationship between Copyright and Patent Law

While the *Lotus* case should be decided under traditional copyright doctrine, an understanding of the critical relationship between copyright and patent protection is essential to understanding why a decision significantly limiting copyright protection for some user interfaces, such as that produced by the Lotus 1-2-3 program, best comports with the overall system of intellectual property protection. In fact, it is the broad copyright protection for such interfaces conferred by the district court in *Lotus* and its earlier *Paperback* decision[13] that constitutes a radical departure from fundamental intellectual property law principles.

Despite the similar basic approach of patent and copyright law—both draw a balance between providing an incentive for the creation of works and ensuring that the public and later creators can enjoy and build upon an expanding "public domain"—they are distinct components of a coherent scheme of intellectual property protection. Patent law seeks to promote the advancement of technology while copyright law seeks to encourage culture and the arts. Given their different foci, it is not surprising that Congress has crafted very different balances in these two statutes. In exchange for protection of claimed functional attributes of an invention, the patent law requires an inventor to demonstrate to a technically trained examiner that the asserted invention is novel, nonobvious, and useful. After meeting these exacting requirements, the holder of a United States patent is entitled to 17 years of exclusive rights to practice the invention. By contrast, the copyright law presents a much lower threshold for receiving protection—a minimal level of "creativity"—and forgoes any requirement of examination. In return, the author is entitled to protection limited to the expressive content of the work. The term of this protection, however, extends for the life of the author plus 50 years (or 75 years for entity authors).

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critics of *Whelan*'s sweeping scope of protection). However the debate is ultimately resolved concerning the level of detailed program structure that might be covered by a program copyright as a nonliteral element of the program, user interfaces are not nonliteral elements of programs but rather the results of programs. To the extent that Lotus relies on the copyright in its 1-2-3 program for protection of that program's user interface, therefore, its claim should fail. More fundamentally, basic copyright law requires that outputs of computer programs be evaluated solely on the basis of their own merits as expressive works of authorship and not any copyright in the program that produces them. For this reason, too, the district court's attempt to distinguish *Baker v. Selden* as a precedent predating the congressional mandate to protect computer programs, 799 F. Supp. at 215, is without logical support.

13. Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37 (D. Mass. 1990).

In view of the very different thresholds for as well as scope and terms of protection, to extend copyright by protecting functional works[14] without explicit congressional authorization presents grave risks to the integrity of the entire intellectual property law system. Thus, in the seminal case of *Baker v. Selden*,[15] decided more than a century ago, the United States Supreme Court explicitly recognized the fundamentally different roles played by copyright and patent law within that system:

> The copyright of the book, if not pirated from other works, would be valid without regard to the novelty, or want of novelty, of its subject-matter. The novelty of the art or thing described or explained has nothing to do with the validity of the copyright. 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 copyright. The claim to an invention or discovery of an art or manufacture must be subjected to the examination of the Patent Office before an exclusive right therein can

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14. In general, we may say that traditional copyright law, following the dictates of *Baker v. Selden*, has eschewed the protection of function, provided the meaning of the term "function" is understood in a precise way. Copyright does, of course, protect many works that are "useful" to human beings. Maps enable us to go from one place to another; recipes tell us how to bake cakes; accounting books explain how to implement a particular system of accounting. All of these works are copyright protected. They are not, however, "useful articles" within the definition in the Copyright Act, since "[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. . . ." 17 U.S.C. § 101 (1988). Although this definition was adopted in an effort to deal with the problem of industrial design—by excluding utilitarian functions other than to inform or portray an appearance from copyright protection and excluding even expressive aspects of useful articles to the extent they are not separable from the utilitarian functions, 17 U.S.C. § 101 (1988) (definition of "pictorial, graphic, and sculptural works")—it represents a statutory description of the kind of "usefulness" or "functionality" that has always been excluded from copyright protection, as opposed to the "usefulness" inherent in maps and recipe books that have long been a part of copyright.

The Lotus 1-2-3 user interface is functional in the sense used here, because it has the intrinsic functional goal of permitting users of the program to input and manipulate data in a fast, efficient, and easy-to-master manner. If, by some chance, Lotus has managed to discover the fastest, most efficient, and easiest-to-master means of using spreadsheet programs, recognition of a copyright in its user interface is equivalent to giving Lotus a 75-year patent in an optimal functional tool. If, as is more likely, Lotus has made an important advance toward the goal of an optimal spreadsheet interface, recognition of a copyright in its functional features inhibits, for the same period, further incremental development in these tools, without any showing that the advance would have been sufficient for even a 17-year patent.

15. 101 U.S. 99, 102 (1879). In this case Selden was the author of a book describing a system of accounting that Selden claimed to have invented. The book included sample forms for implementing the system by a user. Baker's books taught how to implement a similar bookkeeping system and included sample forms that were similar to the forms in Selden's book. There was no allegation that any textual explanation from Selden's book was pirated. The claim of infringement was predicated on similarity of Baker's forms to those of Selden.

> be obtained; and it can only be secured by a patent from the government.[16]

The Supreme Court in *Baker* thus adopts an important channeling principle that it then applies to the facts of the case:

> Charles Selden, by his books, explained and described a peculiar system of book-keeping, and illustrated his method by means of ruled lines and blank columns, with proper headings on a page, or on successive pages. Now, whilst no one has a right to print or publish his book, or any material part thereof, as a book intended to convey instruction in the art, any person may practise and use the art itself which he has described and illustrated therein. The use of the art is a totally different thing from a publication of the book explaining it. The copyright of a book on book-keeping cannot secure the exclusive right to make, sell, and use account-books prepared upon the plan set forth in such book. Whether the art might or might not have been patented, is a question which is not before us. It was not patented, and is open and free to the use of the public. And, of course, in using the art, the ruled lines and headings of accounts must necessarily be used as incident to it.[17]

The fact that Selden's accounting forms may have satisfied the minimal level of "creativity" required by the copyright law and could have been expressed in a variety of ways was irrelevant to the *Baker* decision. A copyright in the book in no way prevents others from using the methods described, or the forms needed to execute the system.[18] In this way, the Supreme Court established a critical limitation on copyright protection to ensure that technological advances not satisfying the exacting requirements of patent law do not indirectly receive protection through copyright and to preserve the integrity of the entire intellectual property system.

The policy basis for the distinct approaches of patent and copyright law is the social desirability of allowing later technological creators—creators of functional works—to build on and improve, often in small ways, the earlier works of others.[19] Technological improvements are often substantially similar to the products they improve and would infringe if the copyright standard were applied. Such improvements do not infringe a patent in the technology unless they adopt all of the elements, or their substantial equivalents, of a patent claim. Authors of copyright-protected works, as well, build upon public domain works and unprotected elements of protected works, but in taking from the latter, copyright law limits them to the more general or abstract features,

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16. *Id.* at 102.

17. *Id.* at 104.

18. Many cases have implemented this aspect of *Baker v. Selden*. For a more extended discussion and citations, see Samuelson, *supra* note 11, at 226-27 & n.73.

19. *See* Dennis S. Karjala, *Copyright, Computer Software, and the New Protectionism*, 28 JURIMETRICS 33, 39 (1987).

together with those aspects denied copyright protection under *Baker v. Selden*, section 102(b) of the United States Copyright Act, and other limiting doctrines.

Later inventors thus can apply a "ground up" approach to reliance on protected works that precede. Once they are outside all patent claims, they are safe. Later authors, however, must adopt a "top down" approach and take a serious risk of being held liable for infringement as their reliance becomes more detailed. The different foci of patent and copyright law explain their different approaches to infringement. The social utility of allowing subsequent authors to make minor variations on a copyright-protected novel is minimal. For works of fiction, art, and music, variety is the spice of both legal and real life. We prefer to have one hundred different war novels than one hundred versions of "War and Peace" that differ only in their final chapter. Consequently, the broad scope of copyright protection for novels and the long period of its duration fulfills the goal of recognizing the author's creativity without unduly hindering later authors or depriving society of desirable works.[20]

Technology, however, improves incrementally, as later inventors add a bell or a whistle to an earlier invention to make it more desirable or useful to consumers. Many improvements on existing products, being rather straightforward or "obvious" in the sense of patent law, are given no intellectual property protection once they are released to the public. Such products often show at least as much intellectual creativity as many copyright-protected works, but their creators have a monopoly only for the period that is required for competitors to recognize the value or popularity of the improved product, figure out its "secret," if any, and gear up for production and marketing. 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.[21] Hence the "nonobviousness" requirement of patent law, as

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20. Kepner-Tregoe, Inc. v. Carabio, 203 U.S.P.Q. 124, 131 (BNA) (E.D. Mich. 1979) ("[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.").

21. The effort and creativity that go into unpatentable technological advances can be compared to similar unprotected efforts of historians and other authors:

> The urge to compensate for subsequent use of information and ideas is perhaps understandable. An inequity seems to lurk in the idea that much of the fruit of the historian's labor may be used without compensation. This, however, is not some unforeseen byproduct of a statutory scheme intended primarily to ensure a return for works of the imagination. Congress made the affirmative choice that the copyright laws should apply in this way.... To ensure the progress of arts and sciences and the integrity of First

well as its shorter term and disclosure requirements, recognize and promote the incremental nature of technological innovation.

Computer programs, of course, at least in object-code form, are technological in nature: They sequentially set the switches inside a computing machine in such a way that the results can be interpreted as "information processing" by human beings. To the extent that code is now copyright protected, Congress has indicated that a functional work should come under the copyright umbrella. However, the National Commission on New Technological Uses of Copyright Works (CONTU)—established by Congress "to assist the President and Congress in developing a national policy for protecting both the rights of copyright owners and insuring public access to copyrighted works when they are used in computer . . . systems, bearing in mind the public and consumer interest,"[22]—concluded that literal copying of computer programs would dramatically reduce the development costs of second comers and thereby create a disincentive to invest in computer program development.[23] Even if we assume that the application of *Baker v. Selden* and section 102(b) to program code is now more limited than to other technological works—in that the literal code of every program can be said to implement a process or method of operation and yet remains copyright protected—there is no basis for concluding that Congress intended to remove any barriers to the copyright protection of function in other classes of works. The Supreme Court in *Feist*,[24] the Second and Ninth Circuits in *Computer Associates*[25] and *Sega*,[26] and the Northern District of California in *Apple Computer, Inc. v. Microsoft Corp.*[27] have recently reaffirmed the fundamental role of *Baker v. Selden* in copyright analysis.

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> Amendment values, ideas and information must not be freighted with claims of proprietary right.

Harper & Row Pubs., Inc. v. Nation Enters., 471 U.S. 539, 589 (1985) (Brennan, J., dissenting), *quoted with approval in* Feist Pubs., Inc. v. Rural Tel. Serv. Co., 111 S. Ct. 1282, 1289-90 (1991).

22. CONTU Report, *supra* note 7, at 3.

23. Every concrete example of infringement that the CONTU report offers involves direct and literal copying, such as photocopying of printed source code and one-to-one transcription from magnetic tape or disk to paper. CONTU Report, *supra* note 7, at 22-23. The Report goes on to say that "[m]ost infringements, at least in the immediate future, are likely to involve simply copying," but the problem it predicts for the then-future was a technology that permits programs to be stated orally or permits use of a program without copying. *Id.* The CONTU Report nowhere refers to copying of "nonliteral elements," much less copying of user interfaces or other results of programs, as potential infringement.

24. Feist Pubs., Inc. v. Rural Tel. Serv. Co., 111 S. Ct. 1282, 1290, 1297 (1991).

25. Computer Assocs. Int'l, Inc. v. Altai, 982 F.2d 693, 703-05 (2nd Cir. 1992).

26. Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510, 1524 (9th Cir. 1992), *amended*, 1993 U.S. App. LEXIS 78 (9th Cir.).

27. 799 F. Supp. 1006, 1021 (N.D. Cal. 1992).

## C. Application of these Principles to the *Lotus* Case

On a technical analytical level, a court could hardly face a situation in the modern age more squarely on point with *Baker v. Selden* than *Lotus v. Borland*. Selden had created an accounting system—building on ideas of others dating back at least to the innovation of double-entry bookkeeping in 1494 by Luca Paciola[28]—that employed "ruled lines and blank columns, with proper headings on a page, or on successive pages."[29] The organization and content of the blank forms were necessary for anyone to use Selden's system. The forms were, in other words, the predigital interface between Selden's system and the user. Just as Selden's accounting system was an incremental improvement upon prior systems of accounting, Lotus freely built upon prior electronic spreadsheet systems dating back at least to Visicalc, introduced in 1979.[30] Like Selden, Lotus started with existing technology and created a system for entering information into a computer, processing the information, displaying the information on the screen, and putting results obtained into hard copy.[31] That system is implemented by a computer program, and because of the speed of digital processing it is more sophisticated than Selden's accounting system, but there is no essential distinction between them as far as traditional copyright law is concerned. In fact, the presentation of a spreadsheet is often remarkably similar to and no more complex than Selden's "ruled lines and blank columns, with proper headings on a page, or on successive pages."[32] Moreover, the menu

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28. *See* LUCA PACIOLA, SUMMA DE ARITHMETICA, GEOMETRIA, PROPORTIONI ET PROPORTIONALITA (1494), *discussed in* T. BUDD & E. WRIGHT, THE INTERPRETATION OF ACCOUNTS 7 (1930).

29. Baker v. Selden, 101 U.S. 99, 104 (1879).

30. *See* Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045, 1057 (1989) [hereinafter Menell, *Scope of Copyright Protection*] (discussing the process of technological advancement in application programming). The basic methods underlying Visicalc and Lotus 1-2-3 extend back at least to the time of Luca Paciola, as a principal application of spreadsheet analysis is bookkeeping. The key distinctive feature of the Visicalc and Lotus products is the ability simultaneously to calculate and alter tables of information. The basic means by which this ability was brought into accounting—digital processing—was of course the product of neither Visicalc nor Lotus but rather hundreds of predecessors, human and corporate, active in the development of computer science.

31. What the *user* creates using the Lotus system may, of course, be copyright protected. The user-created products of most spreadsheet and word processing software almost always have no function other than to inform or entertain. They are therefore not "functional" in the sense used to distinguish patent and copyright subject matter. *See supra* note 14. This product of the end user must be distinguished from the functional interface developed by Lotus to assist the user's creation of such works. The typewriter is a system that also assists in the creation of copyright-protected works, but the machine itself is not protected by copyright, nor is its user interface—the arrangement of the keys.

32. *Id.*

structure of the Lotus system is a sequence of operations analogous to the ordered process of bookkeeping described in Selden's book.

In stark contrast to the Supreme Court's analysis in *Baker v. Selden*, the district court in *Lotus v. Borland* begins its infringement analysis with an explicit refusal to treat as unprotected idea the very systemic aspects of the Lotus 1-2-3 interface that are denied protection under *Baker*. The court sets up an abstractions scale going from an electronic spreadsheet at the high end down to the precise Lotus 1-2-3 command set as hierarchically arranged by Lotus at the low end.[33] It rejects Borland's argument that the latter is also unprotected for the following reasons:

> The premise of Borland's argument is that an "idea" of Lotus 1-2-3 version 2.01 is complete compatibility with earlier versions of 1-2-3, and more precisely with macros generated for use with earlier versions. Borland argues that the precise menu commands and menu structure are necessary to such functional compatibility. . . . This argument is essentially tautological. As applied to any case involving a useful article, an argument of this kind would always define the idea to incorporate all the specifics of the particular expression of that idea in the allegedly copyrightable work. Nothing would be copyrightable under this methodology of analysis.[34]

The analysis here is perfectly correct, as far as it goes. Nothing in the user interface of Selden's accounting system *was* copyright protected, precisely because of the necessity of using that specific interface in practicing Selden's system. Unfortunately, the district court in *Lotus* draws exactly the wrong conclusion from this analysis. Its insistence that *something* in the Lotus 1-2-3 system must be copyright protected leads to a result in direct conflict with the holding of *Baker v. Selden*.

The second step of the district court's infringement standard compounds this error by simply assessing whether there were many ways of representing spreadsheet interfaces and designing menu trees for inputting and processing information:

> SECOND, the decisionmaker must focus upon whether an alleged expression of the idea, system, process, procedure, or method is limited to elements essential to expression of that idea, system, process, procedure, or method (or is one of only a few ways of expressing the idea, system, process, procedure, or method) or instead includes identifiable elements of expression not essential to every expression of that idea, system, process, procedure, or method.[35]

The court finds that by changing the names of the commands (and therefore the "natural" keystrokes used to invoke them, such as their initial letters) in the main menu and submenus, an "extremely large"

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33. Lotus Dev. Corp. v. Borland Int'l, Inc., 799 F. Supp. 203, 216 (D. Mass. 1992).
34. *Id.* at 217.
35. *Id.*

number of possibilities different from the specific choices made by Lotus were possible.[36] The court adopts a similar approach with respect to the arrangement or hierarchy of the commands.[37]

Had it been dealing with a fanciful work, the district court's analysis would have been appropriate, but *Baker v. Selden* and section 102(b) of the Copyright Act mean more than the merger doctrine for functional features. The whole point of *Baker*'s channeling principle between patent and copyright law is that systems and methodologies are not copyright protected. In this case, users of the Lotus 1-2-3 have learned the Lotus system and many want to use *it*, not some other system. Other users have developed "macros" that must combine Lotus commands precisely as Lotus defines them in order to run on the Lotus system. In order to use the Lotus system, there *must* be identity of commands and command structures. Of course, it is possible for Borland and other spreadsheet developers to create other systems. Borland, in fact, did that with its native mode interface. But this possibility is irrelevant to the application of *Baker v. Selden* to the facts of *Lotus*: Under *Baker*, the Lotus system is simply unprotected by copyright.[38]

Applying the district court's analysis to the facts of *Baker v. Selden* would therefore require a different outcome in that case. There are countless ways of bookkeeping and methods for inputting and processing accounting information. Hence, Selden would be entitled to protection for his system as well as his forms for recording the information in the manner demanded by his system. Had Selden implemented his accounting system by way of a computer program, as Lotus did, rather than simply describe it in a book, he would under this analysis be entitled to protect the "ruled lines and headings of accounts" and structured methodology of his system. Thus, the district court in this case has effectively overruled *Baker v. Selden*, a central pillar in the United States intellectual property protection system.

This is not to say that there can never be copyright-protected "expression" in a computer program user interface. A straightforward example would be the fanciful characters and the environments in which they chase or avoid enemies in video games.[39] It is even possible that

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36. *Id.* at 217-18.

37. *Id.* at 218-19.

38. That the district court did not apply the proper test in this case is clear. The court repeatedly refers to functionality in elements it found to be protected: "[T]he menu commands are an important part of the functionality of the macros." *Id.* at 208. "Borland admits to copying the functionality of the keystroke sequences and macro language." *Id.* at 209. "The menu command hierarchy is an integral part of the functionality of the macros and of the keystroke sequences." *Id.* at 219.

39. *E.g.*, Stern Elecs., Inc. v. Kaufman, 669 F.2d 852, 854 (2nd Cir. 1982) (spaceships, ground missile bases and fuel depots, and background terrain); Atari, Inc. v. North

some aspects of the Lotus 1-2-3 user interface, at least its screen displays, are included solely for aesthetic purposes and are not part of any of the processes, operations, or methods by which the user actually employs the program. Textual information under the "Help" operation will in many cases be copyright protected like any other literary work. But that should be the test: Is an aspect of the interface chosen solely to portray an appearance or to convey information or does it have another utilitarian function—is it something that the user must do in order to make *this* program operate in the intended manner?[40] If it is, section 102(b) and *Baker v. Selden* require that it be excluded from copyright protection.

Lotus may feel that it has made a fundamental advance in making personal computers useful to nonspecialists. If, in fact, Lotus has made a nonobvious advance in the art over the products of predecessors on whom Lotus relied, it should have sought patent protection for those advances.[41] Lotus has a copyright in its program, which is undoubtedly a complex piece of work, that affords Lotus important protection against piracy of program code. Lotus does not allege, however, that Borland copied its program code or protectable nonliteral elements (if any) of that program code. Although it is not strictly relevant to the copyright analysis, Borland did not even gain the advantage over Lotus of avoiding the design costs of a graphical user interface for a spreadsheet program because Borland designed *both* what it felt would be a better interface *and* wrote code that would implement the Lotus interface to accommodate users who, like the beleaguered users of the QWERTY typewriter keyboard, had learned the Lotus system and were reluctant to change. It is precisely that kind of productive use of unpatented functional works that the exclusion from copyright protection of *Baker v. Selden* is designed to promote.

We also do not mean to suggest that aspects of user interfaces or other outputs of computer programs might not merit greater protection than currently exists under intellectual property law. Rather, we believe, as did CONTU,[42] that the legislature is the appropriate body to expand the scope of intellectual property protection. In the 1980 amendments to the Copyright Act and the Semiconductor Chip Protection Act of 1984, Congress has, after careful study and broad involvement of affected interests and the public at large, extended intellectual property protection

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American Philips Consumer Elecs. Corp., 672 F.2d 607, 617 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982) (Pac Man characters).

40. *See supra* note 14.

41. It is worth noting that the Lotus 1-2-3 interface was itself developed at a time when the only judicial decision on the question pointed in the direction of nonprotection under copyright. Synercom Technology, Inc. v. Univ. Computing Co., 462 F. Supp. 1003 (N.D. Tex. 1978).

42. *See* CONTU Report, *supra* note 7, at 46.

to new classes of computer-related works. Over the past four years, the Office of Technology Assessment has undertaken, at the behest of Congress, studies of the efficacy of existing legal protection for computer software.[43] We fully expect that Congress will seek to address perceived gaps in this system should existing protection, properly applied by the courts, prove inadequate. It is not, however, the province of courts to take over this lawmaking function by extending protection beyond the limits established by traditional doctrines undergirding the intellectual property system. The district court in *Lotus v. Borland* clearly exceeded these bounds, expanding protection afforded *outputs* of computer programs—user interfaces—and effectively overruling *Baker v. Selden* without the authorization of Congress. Even if additional protection were warranted for computer-user interfaces, it is not at all clear that traditional copyright protection—with its long term of protection and exclusivity of rights—would be appropriate.[44] As other courts grappling with software cases have recognized, the judiciary is ill-suited to weighing the complex issues involved in expanding or reforming intellectual property law.[45]

Computer software, by its very nature as written work intended to serve utilitarian purposes, defies easy categorization within our intellectual property system. Cases involving computer software have therefore presented difficult challenges for courts, which have not always correctly applied traditional copyright doctrines in conjunction with Congress's adoption of CONTU's recommendations to a complex and evolving technology. As a prime example, *Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.*,[46] stood for six years as an influential decision on the scope of protection for nonliteral aspects of program code despite cogent academic criticism. The Second Circuit's sweeping repudiation of the *Whelan* approach in the *Computer Associates* case in 1992, building upon this academic literature and reasserting essential limiting doctrines of copyright law, has supplanted the *Whelan* approach in substantially all subsequent decisions.[47] Similarly with regard to copyright protection for

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43. U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, FINDING A BALANCE: COMPUTER SOFTWARE, INTELLECTUAL PROPERTY AND THE CHALLENGE OF TECHNOLOGICAL CHANGE (May 1992); U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, COMPUTER SOFTWARE AND INTELLECTUAL PROPERTY: BACKGROUND PAPER (March 1990).

44. *See* Peter S. Menell, *Tailoring Legal Protection for Computer Software*, 39 STAN. L. REV. 1329, 1370-71 (1987); Menell, *Scope of Copyright Protection*, *supra* note 30 at 1050 n.20 (1989).

45. *See, e.g.*, Computer Assocs. Int'l Inc. v. Altai, 982 F.2d 693, 712 (2nd Cir. 1992).

46. 797 F.2d 1222 (3rd Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

47. Computer Assocs. Int'l Inc. v. Altai, 982 F.2d 693 (2nd Cir. 1992); *see* Gates Rubber Co. v. Bando Chem. Indus., Ltd., 9 F.3d 823, 840 n.17 (10th Cir. 1993); Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510, 1524-25 (9th Cir. 1992), *amended*, 1993 U.S. App. LEXIS 78 (9th Cir.); Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832, 839 (Fed. Cir. 1992);

interfaces, most early district courts addressing the issue—resting upon an erroneous assumption that the copyright in the computer program extends to the outputs of the program and/or building upon the faulty foundation of *Whelan*—have gone astray of fundamental copyright doctrines.[48] As the first appellate court to review this issue, the First Circuit in this case should seize the opportunity to bring copyright protection for outputs of computer programs back into line with the fundamental principles of copyright law.

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Apple Computer, Inc. v. Microsoft Corp., 799 F. Supp. 1006, 1024-25 (N.D. Cal. 1992); CMAX/Cleveland, Inc. v. UCR, Inc., 804 F. Supp. 337, 352 (N.D. Ga. 1992).

48. Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37 (D. Mass. 1990); Digital Commun.. Assocs. v. Softklone Distrib. Corp., 659 F. Supp. 449 (N.D. Ga. 1987); Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986).

# BOOK REVIEW

## COPYRIGHT'S HIGHWAY: THE LAW AND LORE OF COPYRIGHT FROM GUTENBERG TO THE CELESTIAL JUKEBOX

## by PAUL GOLDSTEIN
## HILL & WANG, NEW YORK, NY; 253 PAGES; $21.00


### REVIEWED BY ROBERT CHOW †


In the not too distant future, people will no longer drive to the video store and stand in line to rent the latest movies. Nor will they visit music stores to buy a copy of the latest hit single. Instead, people will have access to vast libraries of films, sound recordings, and printed material from the convenience and comfort of their homes. They will simply send electronic commands from their personal computers or consoles mounted on their television sets and whatever they desire will appear on the screen. This cache of movies, music and writings may take the form of either a satellite orbiting above the earth or an earthbound network of fiber optic cables and telephone wires. This technology is what Stanford Law Professor Paul Goldstein has coined the "Celestial Jukebox."[1] Others know it by the less elegant term, "Interactive Television."

But here's the rub. Copyright laws as they exist today may not protect copyrighted works distributed via the celestial jukebox. Presently, people are free to make copies of copyrightable works as long as such copies are made for non-commercial use in the privacy of their homes.[2] Even though private copying undercuts a copyright owner's ability to recoup the work's value, Congress and the courts have deemed such non-commercial copying noninfringing because it would be economically impracticable to collect licensing fees from each individual private user.

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1. PAUL GOLDSTEIN, COPYRIGHT'S HIGHWAY: THE LAW AND LORE OF COPYRIGHT FROM GUTENBERG TO THE CELESTIAL JUKEBOX 28 (1994).

2. This doctrine has been explicitly applied to both audio recordings, *see* 17 U.S.C. § 1008 (1992), and video recordings, *see* Sony v. Universal City Studios, 464 U.S. 417 (1984).

Goldstein, however, argues that the assumptions exempting home recordings from copyright infringement are no longer true. The same technology that will give people access to entertainment on demand will also make it possible to charge subscribers electronically for each use of a pre-recorded work.[3] Goldstein predicts the price of access to such works could drop to the point where people, knowing they can access the work on the celestial jukebox anytime, would simply not bother making copies.[4] Producers of copyrightable works would receive the full value from their creative endeavors and there would be little need for home recording devices.[5] But to make it so, Congress must rewrite copyright laws so that they extend to private copying. Goldstein believes that "[i]f Congress and the courts continue to hesitate to extend copyright into the home, and copyright's public-private distinction persists and is not adjusted to the technologies of the celestial jukebox, the integrity of copyright will be threatened."[6]

Whether you believe that copyright laws need to be rewritten to accommodate the celestial jukebox, or whether you agree that copyright ought to reach as far as Goldstein urges, *Copyright's Highway: The Law and Lore of Copyright from Gutenberg to the Celestial Jukebox* is worth reading. Goldstein takes the reader on a splendid journey through the colorful history of copyright and offers a bold vision of the future. The author's lucid articulation and elegant presentation of the intriguing concepts underlying copyright law offer something for all readers, whether they be laypersons or lawyers, copyright scholars or the merely curious.

The author explains the dynamic force shaping copyright as the tug-of-war between two groups who argue whether copyright is a glass half full or half empty.[7] He describes "optimists" as those who see the glass half full, believing copyright is a natural right, entitling authors to every last penny that other people will pay to obtain copies of their works. On the other side, "pessimists," those who see copyright as a glass half-empty, believe copyright owners should only get as much control over copies as is necessary to provide an incentive to produce creative works.

The author claims to have one foot in each camp. He is a pessimist when it comes to bringing new subject matter under the protection of copyright. "As new forms of technological subject matter claim copyright protection, lawmakers should carefully measure them against copyright's historic standards and resist the temptation to extend protection simply

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3. GOLDSTEIN, *supra* note 1, at 28.
4. *Id.* at 30.
5. *Id.*
6. *Id.*
7. *Id.* at 15.

because copyright represents the most capacious and catholic intellectual property doctrine."[8] He is dubious about the inclusion of computer software as copyrightable subject matter and describes the United States Copyright Office's registration of computer programs as "panglossian."[9] He objects to copyright protection for software because he believes the duration of such protection is much too long for such fast-moving technology. Furthermore, copyright protection for software risks creating monopolies over things that belong within the public domain.[10]

But once Congress has properly determined that something deserves copyright protection, Goldstein becomes a zealous optimist. He believes that copyright protection should then reach as far as practically possible so that authors and other creators of copyrightable works receive the necessary incentive to create new work and develop new markets.[11] "As new technological uses of copyrighted works emerge, lawmakers should be quick to extend copyright to encompass them, even if the uses are construed as private."[12]

Although numerous commentators see the digital revolution leading to the extinction of copyright,[13] Goldstein finds a ray of hope. The author sees the digitization of data as simultaneously posing the greatest opportunity and the greatest challenge for copyright. The opportunity lies in the potential for using the celestial jukebox in a manner that will allow producers of creative works to recapture the economic value lost to private copying. Presently, producers of movies, television programs, music and other publicly performed works recover the value of their works through the imprecise method of blanket licensing fees from broadcasters. Broadcast audiences are for the most part free to listen to performances of copyrighted works without charge. Private copying further diminishes the compensation copyright holders receive for producing their works, as such copies displace retail sales and rentals of authorized originals from which publishers, movie studios and record companies earn their revenues. The law, however, permits such copying to continue because of the belief that it cannot be practically regulated.

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8. *Id.* at 202.
9. *Id.* at 203.
10. *Id.*
11. *Id.* at 216-17.
12. *Id.* at 202.
13. NICHOLAS NEGROPONTE, BEING DIGITAL 58 (1995) ("Copyright law is totally out of date. It is a Gutenberg artifact. Since it is a reactive process, it will probably have to break down completely before it is corrected."); *see also* John Perry Barlow, *The Economy of Ideas: A Framework for Rethinking Patents and Copyright in the Digital Age*, WIRED, March 1994, at 85 ("Intellectual property law cannot be patched, retrofitted, or expanded to contain digitized expression any more than real estate law might be revised to cover the allocation of broadcasting spectrum.").

Goldstein suggests that the celestial jukebox can correct these market and regulatory failures:

> For copyright optimists, at least, one virtue of the celestial jukebox is that it can reverse the losses they see copyright owners suffering today when people make copies of films and sound recordings: by charging subscribers electronically for each use of the prerecorded works it offers—motion pictures, sound recordings, books, magazines or newspaper articles—the celestial jukebox will be able to compensate copyright owners each time their works are chosen.[14]

In fact, if Goldstein's vision is carried to its logical conclusion, there may be little need in the future for inexact devices like American Society of Composers, Authors and Publishers (ASCAP) and Broadcast Musicians Inc. (BMI). For that matter, there may not be much need for television and radio stations, video rental shops, advertisers and a host of other media middlemen. Goldstein, however, does not believe the celestial jukebox will ever completely displace traditional copyright markets.[15]

The challenge, the author suggests, lies in convincing Congress to amend the copyright laws so that they prohibit private recording of works delivered over the celestial jukebox before it is too late:

> By and large, copyright owners suffer and consumer electronic companies benefit any time Congress postpones a decision on home copying. As time passes, more and more consumers acquire new copying equipment and, with it, the expectation of free copying. As habits of free use proliferate, the prospects for dislodging them diminish. Ideal, balanced laws that might have been possible within a year or two of a new technology's arrival in the marketplace can, five years later, be politically impossible.[16]

Of course, getting Congress to act promptly is no easy task. Historically, Congress has waited 20 years before re-writing copyright laws to accommodate new technology—much too slow for present cycles of innovation. "As the pace of technological change quickens, Congress seems less and less able to adjust copyright laws to the changes,"[17] Goldstein writes. The author describes two examples in which Congress' failure to respond to new technology led to the erosion of copyright: the invention of photocopiers, and home video cassette recorders.

In the absence of Congressional action, the courts have been reluctant to extend the reach of copyright. The author focuses in

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14. GOLDSTEIN, *supra* note 1, at 30.
15. *Id.* at 224.
16. *Id.* at 134.
17. *Id.* at 32.

particular on the Court's decisions in *Williams & Wilkins Co. v. The United States*[18] and *Sony v. Universal City Studios.*[19]

Goldstein's detailed account of *Williams & Wilkins* captures the drama behind publisher William Passano's copyright infringement suit against the National Library of Medicine and the National Institute of Health for the systematic photocopying of articles from journals published by Williams & Wilkins. The author draws from interviews with many of the principals in the case as well as from court opinions and transcripts to lead the reader step-by-step through the landmark case. In a 4-3 decision, the U.S. Court of Claims ruled against Passano because of concerns that finding copyright infringement would harm medical research, leaving the matter for Congress to resolve. An evenly divided panel of Justices let stand the U.S. Court of Claims decision. When Congress finally did act, it adopted 28 U.S.C. § 108 of the 1976 Act, which provided a statutory exemption from copyright for library photocopying.

In the chapter discussing *Sony v. Universal,* the author gleans new insight from the late Justice Thurgood Marshall's court papers, only recently made public by the Library of Congress. Following oral arguments, the Supreme Court was poised to affirm the Ninth Circuit's holding that Sony's sale of Betamax recorders amounted to contributory copyright infringement. Justice Stevens, who had been originally assigned to write the dissent, persuaded four other justices to endorse his view, turning Justice Blackmun's opinion into a four-Justice dissent. Part of the Court's reluctance to hold Sony liable as a contributory infringer stemmed from distate for the idea of characterizing the millions of home users of video recorders as lawbreakers.[20] But Goldstein believes the Court's concern was unfounded. Goldstein writes, "The Supreme Court should have realized that, even if it had ruled for Universal and Disney rather than for Sony in the Betamax case, the film companies would not have sought injunctions against home copiers. More likely, working together with VCR manufacturers, the studios would have negotiated a VCR and videotape royalty that reflected the value of VCRs and videocassettes in making home recordings of copyrighted films."[21]

Given the lessons of *Williams & Wilkins* and *Sony,* Goldstein fears that the celestial jukebox's potential for revitalizing copyright will be lost if producers of creative works fail to convince Congress to rewrite copyright laws to prohibit private copying.

Yet, Goldstein does not explain how Congress should go about prohibiting private copying. Video and audio recording devices are

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18. 420 U.S. 376 (1975).
19. 464 U.S. 417 (1984).
20. GOLDSTEIN, *supra* note 1, at 150.
21. *Id.* at 218-19.

found in most homes today. Even though the celestial jukebox makes it possible to bill subscribers for the movies and music they select, what is to prevent them from recording as they view their selections? The author himself admits that Congress is loathe to adopt laws that cannot be effectively enforced.[22]

The fact that the celestial jukebox provides copyright holders the ability to reap the full economic value of their works, however, begs the question of whether they ought to be entitled to reach that potential. As Stephen Breyer noted in his 1970 Harvard Law Review article, "The Uneasy Case for Copyright,"[23] few workers receive salaries that amount to the full value of their labor. Why should a producer of creative works be paid more than the cost of persuading him to create the work? Perhaps Goldstein's metaphor of the half-filled glass is backwards. The author and others who advocate extending the reach of copyright to recover the entire economic value are those who view copyright's glass as half empty and will not be satisfied until they see the other half filled.

The author's interest in seeing copyright "extend into every corner of economic value" may be more than academic. The author served as a consultant to the plaintiffs in the infringement suit against Sony, and he continues to consult for the movie and recording industry. Goldstein's perspective is certainly one that furthers the interests of producers of movies and musical recordings.

Goldstein suggests that extending copyright's reach as far as practically possible is justified even if one views copyright from a utilitarian perspective. He offers the economic theories of Chicago School economist Harold Demsetz, who reasoned that the more an author is compensated for economic value, the more accurately price functions as a signal of consumer preference. This encourages the most efficient channeling of private investment in the production of creative works.[24]

Goldstein neglects to discuss other justifications for excluding private copying from copyright besides market failure. In *Twentieth Century Music Corp. v. Aiken*,[25] Justice Stewart noted the need for balancing the copyright holder's interest against the public's interest:

> The limited scope of the copyright holder's statutory monopoly, like the limited duration required by the Constitution, reflects a balance of competing claims upon the public interest: Creative work is to be encouraged and rewarded, but private motivation must ultimately serve the cause of promoting broad public availability of literature, music, and the other arts.[26]

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22. *Id.* at 131.
23. Stephan Breyer, *The Uneasy Case for Copyright*, 84 HARV. L. REV. 281 (1970).
24. GOLDSTEIN, *supra* note 1, at 178-179.
25. 422 U.S. 151 (1975).
26. *Id.* at 156.

Indeed, the digitization of copyrighted works provides for the recovery of the full economic value from such works precisely because of unprecedented control over access. Law Professor Pamela Samuelson notes that the ease with which works in digitized form may be replicated and transmitted to multiple users creates a strong incentive for copyright industries to move away from sales of copies, and toward greater control over the use of their works.[27] Such control over access, however, has the potential for allowing copyright holders to extend ownership of their works beyond the duration of the copyright term.[28] Goldstein himself recognizes the concerns over the public's access to copyrighted work by stating, "With the celestial jukebox, while the quantity of entertainment and information will doubtless increase for those who are able and willing to pay for it, it will probably shrink for those who are not."[29] The author, however, fails to address those concerns.

Regardless of one's point of view on copyright, *Copyright's Highway* raises an intriguing vision of the future for copyright. Whether the future develops as Goldstein envisions will depend on a multiplicity of factors: whether the technology will be implemented as Goldstein suggests;[30] whether consumers adopt the technology;[31] and how Congress and courts shape and interpret the copyright laws to meet the challenge of the digital age.

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27. Pamela Samuelson & Robert J. Glushko, *Intellectual Property Rights for Digital Library and Hypertext Publishing Systems*, 6 HARV. J.L. & TECH. 237 (1993).

28. *Id.* at 253.

29. GOLDSTEIN, *supra* note 1, at 32.

30. *See generally* NICHOLAS NEGROPONTE, BEING DIGITAL (1995). Negroponte suggests that even with entertainment-on-demand, consumers will prefer to download copies of digitized works and store them for future viewing, rather than viewing the works as they are delivered. This approach will invariably require copying of the work. Furthermore, consumers will have competing demands on use of the fiber optic conduit into their homes from video telephoning and other services. Thus consumers will not want to tie up their fiber optic connections by watching digitized works in real time as they are being delivered. *Id.* at 46-48, 174-176.

31. EVERETT M. ROGERS, DIFFUSION OF INNOVATION, 120-22 (1995).

# BOOK REVIEW

## CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES

## by JOHN A. ROBERTSON
## PRINCETON UNIVERSITY PRESS, PRINCETON, NJ
## 281 PAGES; $29.95

REVIEWED BY DUANE R. VALZ †

### INTRODUCTION

The past fifty years have witnessed considerable progress in the field of reproductive technology.[1] However, the successful development of *in vitro* fertilization (IVF) in the 1980s ushered in a new era of heightened ethical concerns.[2] IVF at once entails the disembodiment of conception, embryo manipulation and experimentation, and often the creation of multiple embryos, not all of which can be implanted. Moreover, IVF has made possible a host of related and more controversial reproductive technologies and practices, including embryo cryopreservation,[3] gestational surrogacy,[4] and most recently pre-embryo

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1. For an overview by decade of the major technical developments in the treatment of infertility see Serena H. Chen, M.D. & Edward E. Wallach, M.D., *Five Decades of Progress in Management of the Infertile Couple*, 62 FERTILITY & STERILITY 665 (1994).

2. See *id.* at 676-79 for a review of the various technical procedures which may comprise an *in vitro* fertilization cycle.

3. Also known as "embryo freezing." For the leading case addressing the custody/disposition conflicts that may arise from the use of cryopreservation, see Davis v. Davis, 842 S.W.2d 588 (Tenn. 1992). *Cf.* Kass v. Kass, 1995 WL 110368 (N.Y. Sup. Ct. 1995).

4. Johnson v. Calvert, 5 Cal. 4th 84 (1993) (articulating an "intentional parenthood" standard in determining that a husband and wife who contributed the gametes for producing their son retained full parental rights respecting the child, though the surrogate they hired to gestate the child actually gave birth to it). *Cf.* McDonald v. McDonald, 608 N.Y.S.2d 477 (1994). *McDonald* applied the intentional parenthood standard to a situation where, consequent to their divorce, a husband attempted to deprive his wife of parental rights respecting their daughter because the child was the product of his and an ovum-donor's gametes. The court found that even though the wife was, biologically, only a gestational mother to the child, her intention to be its mother before the child was ever conceived or implanted was enough to confer upon her legal maternal status.

splitting.[5] On the horizon lies the prospect of germ-line gene therapy,[6] and perhaps artificial wombs.[7] The very idea of such technologies has elicited strong responses—some herald them for expanding the range of procreative opportunities available to the infertile while others denounce them for defiling the sanctity of nature, human life, and the procreative process.

There is no doubt that New Reproductive Technologies (NRTs) have allowed many parents to bear children where they would have been unable to otherwise. Although having infertility treatment is not medically necessary, the desire to become a parent is a strong, compelling one for most adults. Adoption has long been an option for the infertile, but it is often an expensive, time consuming, and legally arduous process. Additionally, many prospective parents find NRTs particularly valuable because they allow parents to have children with whom they share a biological bond. To the extent that NRTs do enable prospective parents to enhance their reproductive capacities and avoid the complications of adoption, they have been a very positive development.

However, sex and reproduction remain contentious and politically charged topics in contemporary American society. New reproductive practices are proliferating in a context where social views about such issues as abortion, teen pregnancy, sexually transmitted disease, homosexuality, interracial relationships, and single motherhood continue to diverge. Further, our notions of parenthood and family are also being challenged by the increasing number of divorces, out-of-wedlock births, and incidences of single parenthood. While these issues do not always relate to NRTs directly, they often impinge on discussions of the social and cultural impact of NRTs and their related practices. For instance, members of the gay and lesbian community are more frequently turning

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5. Also commonly referred to as "cloning," though this is technically a misnomer. *See* Philip Elmer-Dewitt, *Cloning: Where Do We Draw the Line*, TIME, Nov. 8, 1993, at 65; Gina Kolata, *Scientist Clones Human Embryos, And Creates an Ethical Challenge*, N.Y. TIMES, Oct. 24, 1993, at 1:1.

6. *See* Gina Kolata, *Gene Technique Can Shape Future Generations*, N.Y. TIMES, Nov. 22, 1994, at A1, B9 (outlining a procedure whereby scientists can isolate, transplant and/or alter sperm stem cells, early-stage sperm cells which are the genetic source of all sperm cells in a given organism. Genes inserted into stem cells will appear in all sperm derived therefrom and consequently in every cell of an organism's progeny. Such treatment will be feasible for practice in human beings within five years). *See also Transgenic non-human mammals*, U.S. Patent No. 4,736,866 (1988). This patent is for the notorious Harvard oncomouse. An oncomouse is basically one which, while an embryo, has had a deleterious gene added to its genome that makes it highly susceptible to cancerous polyploid growths. This type of alteration is a form of germ-line therapy.

7. *See, e.g.*, Nobuya Unno et al., *Development of an Artificial Placenta: Survival of Isolated Goat Fetuses for Three Weeks With Umbilical Arteriovenous Extracorporeal Membrane Oxygenation*, 17(12) ARTIFICIAL ORGANS 996 (1993); Yoshinori Kuwabara, *Approach to the Management of Fetuses and Immature Babies—Development of the Extrauterine Fetal Incubator*, 32(8) ASIAN MED. J. 419 (1989).

to artificial insemination and surrogate motherhood in order to have biologically related children without having to contend with someone of the opposite sex who can assert parental rights.[8] Further, whether prospective parents are homo- or heterosexual, the employment of surrogate mothers raises the issues of whether parents should be allowed to hire the reproductive capacities of others in order to further their own procreative objectives, and who should achieve parental status if a dispute arises.[9] Many argue that reproductive methods like surrogate motherhood treat both hired third parties and resultant children too much like commodities.

Because they entail procedures and enable reproductive outcomes previously unassociated with parenthood, NRTs in many ways defy traditional political boundaries and legal classification. Consequently, state legislation and caselaw from around the country reflect vast differences in the way that various NRTs are regulated, and how conflicts stemming from their use are resolved. For example, some states prohibit commercial surrogate motherhood entirely, while those that allow it employ different standards for determining parental status when surrogates come at odds with those who hire them.

It is against this backdrop that one can place John Robertson's latest work, *Children of Choice: Freedom and the New Reproductive Technologies*, and the range of issues that he addresses therein. Robertson is a prolific and highly regarded thinker in the field of reproductive law and ethics.[10] In *Children of Choice* he consolidates his normative views on a variety of new reproductive practices into a comprehensive theory of reproductive freedom. Robertson's background as a Constitutional scholar greatly influences his formulation of the moral and legal principles underlying procreative liberty, the fulcrum of his theoretical position. The concept of

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8. Such practices raise the questions of gay parenthood, and— since gays and lesbians cannot legally marry— raising children out of wedlock.

9. *See generally* Johnson v. Calvert, 5 Cal. 4th 84 (1993).

10. Robertson is the Thomas Watt Gregory Professor of Law at the University of Texas at Austin. Robertson's work in the field of law and reproduction includes: John A. Robertson, *The Question of Human Cloning*, 24(2) HASTINGS CENTER REP. 6 (1994); Robertson, *Ethical and Legal Issues in Preimplantation Genetic Screening*, 57 FERTILITY & STERILITY 1 (1992); Robertson, *Procreative Liberty and Human Genetics*, 39 EMORY L.J. 697 (1990); Robertson, *In the Beginning: The Legal Status Of Early Embryos*, 76 VA. L. REV. 437 (1990); Robertson, *Prior Agreements for Disposition of Frozen Embryos*, 51 OHIO ST. L.J. 407 (1990); Robertson, *Ethical and Legal Issues in Human Egg Donation*, 52 FERTILITY & STERILITY 353 (1989); Robertson, *Technology and Motherhood: Legal and Ethical Issues in Human Egg Donations*, 39 CASE W. RES. L. REV. 1 (1988-89); Robertson, *Procreative Liberty and the State's Burden of Proof in Regulating Noncoital Reproduction*, 16 L. MED. & HEALTH CARE 27 (1988); Robertson, *Fetal Tissue Transplants*, 66 WASH. U. L.Q. 443 (1988); Robertson, *Embryos, Families, and Procreative Liberty: The Legal Structure of the New Reproduction*, 59 S. CAL. L. REV. 939 (1986), Robertson, *Embryo Research*, 24 W. ONTARIO L. REV. 15 (1986); Robertson, *Procreative Liberty and the Control of Conception, Pregnancy and Childbirth*, 69 VA. L. REV. 405 (1983).

procreative liberty encompasses the notion that individuals have a presumptive right to make basic reproductive decisions. In Robertson's view, our reproductive experiences are central to our personal conceptions of meaning and identity.[11] To prevent procreative choice is to "deny or impose a crucial self-defining experience, thus denying persons respect and dignity at the most basic level."[12] As such, the precept of procreative liberty deserves respect in all reproductive activities, whether *au naturel* or requiring technological assistance.[13] Further, state attempts to restrict persons' reproductive choices should face the weighty burden of overcoming the presumptive primacy of procreative liberty.

Commentators on NRTs have contributed critical perspectives through a variety of theoretical and doctrinal lenses.[14] Of these, Robertson's approach is among the most compelling. Robertson's utilization of Constitutional doctrine allows him to ground his perspectives on some of the more vague and troubling issues surrounding NRTs in familiar and authoritative terms. If one agrees that procreative liberty interests should always be given favor, *Children of Choice* offers a thorough and well-articulated justification for such a position. If one is more skeptical about procreative liberty interests being given primacy in inquiries concerning NRTs, the book offers a series of principled arguments which would have to be addressed in order to effectively advance an alternative normative position.

## SYNOPSIS

The first chapter of *Children of Choice* reviews the contemporary scope of reproductive practices and the basic controversies which they elicit. Chapter 2 presents Robertson's framework for procreative liberty, its legal foundation, moral basis, and normative scope. The other chapters of the book apply this theoretical framework to different areas of reproductive practice, assessing which procreative liberty interests are invoked in each case, and to what extent such interests should be allowed to prevail.

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11. JOHN A. ROBERTSON, CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES 4 (1994) [hereinafter ROBERTSON, CHILDREN OF CHOICE].

12. *Id.*

13. *Id.*

14. *See, e.g.*, Marjorie M. Shultz, *Reproductive Technology and Intent-Based Parenthood: An Opportunity for Gender Neutrality*, 1990 WIS. L. REV. 297 (1990) (contract law); Margaret Jane Radin, *Market-Inalienability*, 100 HARV. L. REV. 1849 (1987) (property law); William J. Wagner, *The New Reproductive Technologies and the Law: A Roman Catholic Perspective*, 4 J. CONTEMP. HEALTH L. & POL'Y 37 (1988) (theology); GENA COREA, THE MOTHER MACHINE: REPRODUCTIVE TECHNOLOGIES FROM ARTIFICIAL INSEMINATION TO ARTIFICIAL WOMBS (1985) (feminism).

Procreative liberty, as a matter of Constitutional doctrine, "is a negative right against state interference with choices to procreate or to avoid procreation."[15] Accordingly, Robertson posits, while neither the state nor particular persons have any positive duty to provide reproductive resources or services, they do have a duty not to impede someone from seeking such means. Robertson is concerned not only with advocating ethics of personal autonomy, family, and community, but also with guarding against excessive governmental control of reproduction, which "may extend beyond exhortation and penalties to Gestapo and police state tactics."[16] In fact, such concerns are not entirely fanciful. As Robertson shows, NRTs are sought not only by prospective parents, but also by various governmental institutions to further public policy goals such as preventing irresponsible parenthood. Consequently, as a matter of methodology, Robertson consistently scrutinizes which parties are seeking to employ a given technology, as well as their reproductive objectives in doing so.

Robertson cites two Supreme Court cases as providing the contemporary underpinnings for the fundamental legal right to avoid reproduction: *Griswold v. Connecticut*[17] and *Planned Parenthood v. Casey*.[18] In *Griswold*, the Court found that a law which criminalized using or distributing contraceptives violated a fundamental liberty right of married couples. The High Court later extended this holding to unmarried persons, as a matter of personal liberty and privacy.[19] In *Casey*, the Court reaffirmed *Roe v. Wade*,[20] holding that all women have a right to terminate pregnancy up to the point of viability. While these cases establish that anyone has the right to avoid reproduction both before and after conception, they do not provide that once a child is born, men or women may irresponsibly avoid their parenting obligations.[21]

Regarding the pursuit of reproduction, Robertson posits the existence of such a fundamental right based on dicta from a series of Supreme Court cases. In *Skinner v. Oklahoma*,[22] the Court struck down a law which allowed for the nonconsensual sterilization of thieves but not embezzlers. Though the Court employed equal protection doctrine in deciding the case, it noted that marriage and procreation are among the basic civil rights of man, fundamental to the existence and survival of the

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15. ROBERTSON, CHILDREN OF CHOICE, *supra* note 11, at 23.
16. *Id.* at 25.
17. 381 U.S. 479 (1965).
18. 112 S. Ct. 2791 (1992).
19. Eisenstadt v. Baird, 405 U.S. 438 (1972); Carey v. Population Services Int'l., 431 U.S 678 (1977).
20. 410 U.S. 113 (1973).
21. ROBERTSON, CHILDREN OF CHOICE, *supra* note 11, at 29.
22. 316 U.S. 535, 541 (1942).

human race. These principles have most recently been reiterated by the High Court in *Eisenstadt v. Baird*[23] and *Casey*.[24] In *Eisenstadt*, the Court stated that the right of privacy extends to both married and unmarried persons. Such a right includes freedom from unwarranted governmental intrusion into fundamental matters such as the decision whether to bear or beget a child. In *Casey*, a more conservative Court also noted that marriage, procreation, contraception, family relationships, childrearing and education all involve the most intimate and personal choices a person may make in a lifetime and are central to the liberty protected by the Fourteenth Amendment. Only a compelling interest in averting some considerable harm would justify state intrusion into this protected sphere.

Robertson devotes most of a chapter to discussing why *Casey* is a resuscitation of *Roe v. Wade*. Acknowledging that abortion is an intractable issue of moral absolutes, he frames *Casey* as an intermediate position on the continuum between the total pro-choice and absolute right-to-life positions. Under *Casey*, state laws that pursue legitimate concerns regarding how abortions are provided, but which do not substantially limit access to them or otherwise create an "undue burden," are acceptable.[25] Robertson states that this modified pro-choice position, because it "recognizes a moral and legal right to early abortion but seeks to discourage or prevent abortion[,] has much greater appeal."[26] This given, Robertson also discusses contragestive drugs such as RU486, which prevent or interrupt the implantation of newly conceived pre-embryos. He is a proponent of these drugs since they could help dampen the controversy surrounding abortion. Because they operate before pregnancy itself has begun, contragestives are cheaper and safer than surgical procedures and could also make the choice to avoid reproduction morally and symbolically more palatable.[27]

Having presented the constitutional basis for procreative liberty and its pertinence to personal choice in the area of avoiding reproduction, Robertson then proceeds to address the role of NRTs in positive procreation. With respect to IVF, Robertson identifies two central issues implicating procreative liberty: (i) whether out-of-the-womb conception should occur at all, and (ii) what, if any, legal and moral status attaches to disembodied embryos. As to the first issue, Robertson concludes that IVF clearly falls within the scope of procreative liberty and that any laws banning it would likely be found unconstitutional.[28] Further, the moral

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23. 405 U.S. 438 (1972).
24. 112 S. Ct. 2791 (1992).
25. ROBERTSON, CHILDREN OF CHOICE, *supra* note 11, at 61.
26. *Id.* at 48.
27. *Id.* at 45, 64.
28. *Id.* at 100.

objections to IVF voiced by the Catholic Church, feminists, and others "do not constitute the compelling evidence of tangible harm necessary to justify interference with procreative liberty."[29] As to the second issue, Robertson posits that embryos generally have legal cognizance only when the legal interests of an actual person are involved.[30] He contends that *Roe v. Wade* and other doctrines on abortion pertain only to termination of pregnancies and not to the disposition of embryos before pregnancy actually occurs. Accordingly, practices such as freezing embryos for later implantation or the decision not to implant them after freezing should not be prohibited. Although embryos may arguably deserve some level of respect, Robertson concludes, procreative liberty would dictate that conflicts concerning their disposition should be resolved in favor of the couples who provided gametes for the embryos.

The IVF process often extends beyond the parties wishing to be parents to other parties such as donors, who provide the gametes, and surrogates, who provide the gestation necessary for reproduction. Robertson terms procreation involving such third parties "collaborative reproduction." While he maintains that procreative liberty should presumptively protect engaging the services of a willing donor or surrogate, he acknowledges that collaborative reproduction "involves a novel set of practices and relationships in which social and psychological meanings and legal rights and duties have not yet been clearly defined."[31] In theory, for example, a child could end up with three biological parents (a genetic mother, genetic father, and a gestational mother) and two additional rearing parents, with various permutations of relationship and agreement among them.[32] Not only does such collaboration risk confusing children about who their "real" parents are, but it also subverts our conventional notions of parenthood and family and leaves ample room for conflict over parental status among the various collaborators.[33] Further, many critics argue that donating gametes or providing surrogate services in exchange for money is exploitative and akin to prostitution. This given, Robertson cautions that "the use of the technology to alter fundamental or traditional family relationships seems risky, and should occur only under conditions that protect [equitably] the welfare of offspring, couples, and collaborators."[34] Thus, rather than discouraging collaborative reproduction, policy makers should focus on ensuring that

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29. *Id.*
30. *Id.* at 104.
31. *Id.* at 120.
32. *Id.*
33. *See, e.g.*, Johnson v. Calvert, 5 Cal. 4th 84 (1993), and Thomas S. v. Robin Y., 618 N.Y.S.2d 356 (1994).
34. ROBERTSON, CHILDREN OF CHOICE, *supra* note 11, at 120.

proper counseling, informed consent, record keeping, and legal rules for allocating rearing rights and duties exist.[35]

Another emerging issue in the field of reproductive therapy is the selection of offspring characteristics. Prenatal screening techniques, such as amniocentesis and chorion villus sampling, are becoming increasingly sophisticated. In addition to its gender, many of a fetus' genetic characteristics are ascertainable after only three months of pregnancy. Combined with preemptive abortion or corrective intervention, prenatal diagnostic techniques amount to negative selection. For Robertson, negative selection is protected by procreative liberty, whether employed for "therapeutic" reasons or not.[36] Admittedly, the idea of deliberately selecting, altering, or terminating children on the basis of their anticipated qualities has a disturbing edge. Nevertheless, it is legitimate for parents to want healthy children, and thus for them to use available selection techniques to achieve that end.

Robertson also argues that positive selection, or genetic characteristic shaping, falls within the scope of procreative liberty. He does, though, offer several qualifications. Robertson posits that even if genetic enhancement clearly benefited offspring, it would not necessarily follow that it was protected by procreative liberty. That is, it is not clear whether the general parental desire to produce, healthy, normal children for rearing—which is a presumed objective when other NRTs are employed—is the same with enhancement, cloning, or diminishment interventions.[37] If prospective parents establish, however, that their ability to use characteristic-altering techniques will be determinative of whether they reproduce at all, then their efforts to employ such techniques should nevertheless be protected. Robertson also emphasizes that *in vitro* and *in utero* genetic interventions for humans are not yet feasible. Thus, slippery slope concerns about their potential impact should not be allowed to impede using current screening and negative selection techniques to produce healthy offspring.[38]

It is true that, as a matter of constitutional doctrine, personal decisions concerning marriage, childrearing, and family relationships are protected under the tenets of procreative liberty. However, NRTs call into question what the boundaries of such liberty interests are or should be. To what extent do people have a right to new technologies and the novel alternatives they make possible? That is, to what extent should technological advances be allowed to expand the scope of personal rights

35. *Id.* at 145.

36. *Id.* at 172.

37. *Id.* at 166-67. Robertson suggests that it is the interest in producing and raising healthy, normal children that gives reproductive freedom its value. This interest also provides an outer limit to procreative liberty.

38. *Id.* at 172.

regarded as basic or fundamental? Do the concerns raised by NRTs such as IVF and genetic manipulation have to manifest as "tangible harm" before more vigorous oversight and regulation can be justified? These are some of the underlying questions which Robertson only addresses indirectly. His answers to these are satisfying if one accepts that NRTs and the reproductive practices they make possible fall unproblematically within the traditional domain of parental decision-making and family planning. NRTs, however, in many ways confound conventional notions of what family relationships, childbearing and childrearing, and personhood are in the first place. Certainly, the state has a place in helping to define what the rights and limits attaching to procreation are and how these should be enforced. Robertson is not always consistent about defining the line between personal conceptions of parenting and family and the role the state should play in helping to facilitate the effective integration of NRTs in society.

Robertson also addresses issues related to the contraceptive Norplant and public policy initiatives to prevent irresponsible reproduction. Norplant systems of contraception entail the insertion of matchstick-sized capsules under the skin of women's upper arms which slowly release a synthetic substance that suppresses ovulation. Their effect is temporary sterilization for up to five years, unless the implants are removed. As a voluntary method of contraception, Robertson regards the use of Norplant as fully protected by procreative liberty. Since it has met regulatory standards for safety and efficiency, Norplant presents no major ethical or legal issues beyond informed consent as to its possible side effects and making it available to all women who want it.[39] Norplant is, however, a very effective anti-fertility treatment and is beyond the patient's control once it has been inserted. When legislatures offer incentives for women on welfare to use Norplant, and judges impose the contraceptive as a condition of probation, its use becomes more problematic. After carefully considering the various interests involved, Robertson concludes that only in the most extreme cases should Norplant be employed as a state tool to address allegedly irresponsible reproduction.[40] The public's interest in the welfare of offspring as yet unconceived and in the conservation of public funds does not justify intruding on the basic right to reproduce.

Robertson's views are somewhat more moderate regarding public policy and the prevention of prenatal harm. The issues in this area of concern are whether governmental institutions may impose legal sanctions, forced medical treatment, or other coercive tactics to discipline

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39. *Id.* at 71.

40. *Id.* at 93. Robertson offers the case of severely retarded females who are at substantial risk of sexual exploitation or rape as an example of such an extreme case.

pregnant mothers who are arguably harming children that they intend to bring to term. For Robertson, such issues move beyond the basic question of procreative liberty—the decision to reproduce or not—to second-order questions of liberty in the course of procreation.[41] Consequently, moral duties to take or accept measures to avoid prenatal harm may attach once a woman has determined to proceed with reproduction. Robertson concludes, however, that sanctions and seizures are justified only in the most extreme cases and that the focus of public policy should be on freely chosen measures, education, and the provision of services.[42]

In the final portion of the book, Robertson turns his attention to the use of embryonic or fetal tissues to serve non-reproductive ends, such as research or tissue transplants. He posits that such uses are not matters of procreative liberty, but matters of liberty in the use of one's reproductive capacity.[43] Robert reasons that the symbolic harms arising from the use of post-conception tissues for research or medical application do not outweigh the benefits that such activities produce. Further, not much distinction should be made between post-conception tissues which were the incidental result of abortion, the excess by-products of an IVF cycle, or deliberately created for research or medical purposes.[44] Robertson also notes earlier in the book that "*Roe-Casey* does prohibit any inquiry into motives or reasons for abortion, and thus probably protects conceptions and abortions designed to produce embryos or fetal tissue for research or transplant, and even abortion on gender grounds."[45] His last chapter is dedicated to responding to what he designates as Class, Feminist, and Communitarian critiques of procreative liberty. Ultimately, Robertson urges that in confronting the ethical, legal, and social conflicts over the value-laden arena of NRTs, "we must not deny the importance of procreative liberty just to escape the discomfort that its use often engenders."[46]

## CONCLUSIONS

*Children of Choice* is a comprehensive, well-considered addition to the contemporary inquiry into new reproductive technologies and

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41. *Id.* at 194. Compare this position with Robertson's views on the use of Norplant to further public policy goals, *supra.* Because forced or coerced use of Norplant preempts a woman's decision to reproduce entirely—as opposed to overseeing her treatment of a prenascent child she has determined to bear— Robertson is more strongly opposed to its use by the state.

42. *Id.*

43. *Id.* at 200.

44. *Id.* at 201.

45. *Id.* at 63.

46. *Id.* at 235.

practices. It is clearly articulated and Robertson makes some of the more vague and complex aspects of NRTs easily accessible. To his credit, however, Robertson also candidly acknowledges that his emphasis on procreative liberty

> provides a useful but by no means complete or final perspective on the technologies in question. Theological, social, psychological, economic, and feminist perspectives would emphasize different aspects of reproductive technology, and might also offer better guidance in how to use these technologies to protect offspring, respect women, and maintain other important values.[47]

Robertson's basic formulation of procreative liberty—its precepts, legal foundations, and moral appeal—is quite persuasive. Nevertheless, one may disagree with how he chooses to apply this framework to a given reproductive technology or practice. Depending on one's disciplinary and moral inclinations, for instance, one may choose to construe differently the harms implicated by a given NRT, and to give such harms more or less weight vis-a-vis any parental rights and interests suggested by procreative liberty. Additionally, Robertson is somewhat reticent about asserting normative judgment and extending his procreative liberty analysis to a number of issues which are, admittedly, politically sensitive. For instance, he does not specifically address whether procreative liberty should apply equally to single persons, gay men and lesbians, and other "unconventional" prospective parents. Overall, however, the book is one of the most thorough and informative works on NRTs offered in recent years. Whether one agrees with Robertson or not, his method of treating the many ethical issues involved is both practically and intellectually useful.

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47. *Id.* at 42.