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COMPUTERS, COPYRIGHT AND SUBSTANTIAL SIMILARITY: THE TEST RECONSIDERED

by JEFFREY D. COULTER†

I. INTRODUCTION

At the heart of copyright law is the tension between protecting an author's original expression and preserving a competitive market for the ideas of others. This tension is especially problematic in the context of copyright protection of computer software. As one judge noted, "the case law and commentators in the area of copyright protection seem woefully ill-equipped to provide a systematic means for analyzing copyright issues as they arise in the context of computer software . . . copyright law was not designed to accommodate computer software protection."¹

Nonetheless, copyright law does protect computer software.² This comment focuses on one aspect of that protection—the substantial similarity test courts use to determine copyright infringement. More specifically, it analyzes both the use of expert and lay testimony, and the copyright principle of the idea/expression dichotomy, a key element of the substantial similarity test. The use of expert testimony has proven to be surprisingly controversial, and inextricably entwined with the larger issue of what, exactly, is protectable by copyright; the same may be said of the idea/expression dichotomy.

The comment traces the history and development of the test, beginning with Judge Learned Hand's famous formulation in *Nichols v. Uni-*

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1. *Gates Rubber Co. v. Bando American, Inc.*, 798 F. Supp. 1499, 1502 (D. Colo. 1992).

2. Moreover, and most importantly for purposes of this comment, the non-literal structures of computer programs are protected by copyright. See *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 702-703 (2nd Cir. 1992). The literal elements of a program are its source and object codes. The non-literal elements include its structure, sequence and organization, but not a program's products, such as its screen displays. Such products fall under the copyright rubric of audiovisual works. *Id.* This comment discusses the substantial similarity test for copyright infringement as applied to the non-literal elements of a computer program.

*versal Pictures Corporation*³ through recent decisions in the federal courts that deal specifically with copyright in computer programming. Such tracing is necessary not only to understand the current state of the law, but because the history is the law. Virtually every case discussed in this comment is still followed today in at least one jurisdiction. Finally, the comment proposes a variation on the substantial similarity test which synthesizes the best aspects of the various versions studied. To make such an analysis meaningful, however, some background information on copyright law is essential.

II. COPYRIGHT LAW BACKGROUND

Protection for copyright is derived from the United States Constitution. Congress has the power "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."⁴

The Copyright Act is derived from this power. The Act protects "original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."⁵ Works of authorship include (1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic and sculptural works; (6) motion pictures and other audiovisual works; and (7) sound recordings.⁶ Computer programs are considered literary works for copyright purposes.⁷

Recognizing that courts were somewhat reluctant to fit programs not written in source code within the scope of copyright protection, the National Commission on New Technological Uses of Copyrighted Works (CONTU) prevailed upon Congress to amend the Act.⁸

The resulting amendments defined "computer program" and ensured that copyright protection was extended to all computer programs.⁹ Judicial decisions have extended copyright protection to computer programs

3. 45 F.2d 119 (2nd Cir. 1930).

4. U.S. CONST., art. I, § 8, cl. 8.

5. 17 U.S.C. § 102(a) (1995).

6. *Id.*

7. H.R. REP. NO. 1476, 94th Cong., 2nd Sess. 51, reprinted in 1976 U.S.C.C.A.N. 5659, 5667.

8. Howard Root, Note, *Copyright Infringement of Computer Programs: A Modification of the Substantial Similarity Test*, 68 MINN. L. REV. 1264, 1270 (1984).

9. 17 U.S.C. §§ 101, 117 (1995).

regardless of their form or embodiment.¹⁰

The Act grants the owner of the copyright the exclusive right to reproduce the protected work, prepare derivative works, make copies, and display or perform the work in public.¹¹

Of course, this monopoly is a limited one, and extends not to the idea behind the protected work, but only the expression of that idea.¹² "The copyright laws, by distinguishing by an idea and its expression, attempt to strike a balance between the competing goals of protection of works and free dissemination of ideas."¹³ "Prohibiting the further use of the idea in a copyrighted work would not only narrow the range of artistic endeavors, but would also prevent most of the cumulative innovation that results from building on knowledge."¹⁴

The idea/expression dichotomy has proven elusive of exact definition. Judge Learned Hand opined that "no principle can be stated as to when an imitator has gone beyond copying the 'idea,' and has borrowed from its 'expression.' Decisions must therefore, inevitably be *ad hoc*."¹⁵ One federal district judge noted that "while courts have long struggled with separating idea from expression in more traditional areas, the task is even more daunting in the field of computer software."¹⁶ This difficulty may be traced, at least in part, to the development of the dichotomy in the case law.

The Supreme Court tackled the issue early in copyright jurisprudence. In *Baker v. Selden* the court held that while a book may be copyrighted, the idea it illustrates may not.¹⁷ The book at issue was designed to keep track of accounts. It consisted of a system of headings and columns under which information was to be inserted. The court held that the accounting ideas could not be expressed other than through those particular columns and headings, and thus protection of the book was tantamount to protection of the idea. Such protection was inimical to the goal of copyright law and thus impermissible.

Separating idea from expression in infringement actions is crucial for obvious reasons. Only copyrightable works can be infringed. "In order to establish a claim for copyright infringement, plaintiff must prove its ownership of a valid copyright, and copying, or infringement, of the

10. Suzanne R. Jones, *Whelan Assoc. v. Jaslow Dental Laboratory: Copyright Protection for the Structure and Sequence of Computer Programs*, 21 *LOY. L.A. L. REV.* 255, 270 (1987).

11. 17 U.S.C. § 106 (1995).

12. 17 U.S.C. § 102(b).

13. *Root*, *supra* note 8, at 1274.

14. *Id.* at 1275.

15. *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d 487, 489 (2nd Cir. 1960).

16. *Micro Consulting, Inc. v. Zubeldia*, 813 F. Supp. 1514, 1526 (W.D. Okla. 1990).

17. *Baker v. Selden*, 101 U.S. 99 (1879).

copyrighted work by the defendant.¹⁸ While registration is "*prima facie* evidence of the validity of the copyright and the facts stated in the certificate,"¹⁹ including ownership, part or all of a copyright may be challenged on the ground that it is an unprotectable idea rather than protectable expression.

A threshold issue, however, is whether the work has in fact been copied.

Copyright protection not only protects the author from exact duplication of his or her work, such as an exact duplicate of a computer disk onto another disk, but also copying into a different medium. . . . Further, exact duplication is not necessary for copying. The Copyright Act also protects 'the various modes in which the matter of any work may be adopted, imitated, transferred, or reproduced.'²⁰

III. SUBSTANTIAL SIMILARITY

Plaintiffs would have an easy time of it indeed if they could prove literal, verbatim copying by transcription. However it is not illegal to create an identical copy independently.²¹ The problem of proof is obvious. Absent evidence of literal transcription, copying could not be proved. This problem of proof led courts to develop the substantial similarity test.

The test accomplishes two interrelated functions: (1) it shifts the burden of persuasion on the issue of use of the copyrighted work to the defendant after the plaintiff has shown similarities between the works; and (2) it provides a guide to determine whether the expression or the idea of the copyrighted work has been appropriated.²²

The test has generally been formulated as follows: "[a]s it is rarely possible to prove copying through direct evidence, copying may be proved inferentially by showing that the defendant had access to the allegedly infringed copyrighted work and that the allegedly infringing work is substantially similar to the copyrighted work."²³ Access to the work is rarely at issue, and thus most cases focus on the substantial similarity of the infringing work to the protected work.

A. HISTORY OF THE TEST

Judge Learned Hand articulated the first substantial similarity test

18. 3 MELVILLE B. NIMMER, NIMMER ON COPYRIGHT § 13.01 (1985).

19. 17 U.S.C. § 410(c) (1995).

20. Jones, *supra* note 10, at 259-60.

21. Sheldon v. Metro-Goldwyn Pictures Corp., 81 F.2d 49 (2d Cir. 1936), *cert. denied*, 298 U.S. 669 (1936).

22. Root, *supra* note 8, at 1276.

23. Whelan Assoc., Inc. v. Jaslow Dental Laboratory, Inc., 797 F.2d 1222, 1231-32 (3rd Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

as early as 1930.²⁴ In *Nichols*, the plaintiff wrote the play "Abie's Irish Rose." Universal produced a motion picture entitled "The Cohens and the Kellys," which plaintiff alleged was taken from his play. Learned Hand began the analysis with a plot summary of the two works, revealing at most non-literal copying.

Noting the justification for a substantial similarity test, however, he added that

it is of course essential to any protection of literary property, whether at common-law or under the statute, that the right cannot be limited literally to the text, else a plagiarist would escape by immaterial variations. That has never been the law, but, as soon as literal appropriation ceases to be the test, the whole matter is necessarily at large, so that, as was recently well said by a distinguished judge, the decisions cannot help much in a new case.²⁵

Judge Learned Hand framed the issue as follows: "Then the question is whether the part so taken is 'substantial,' and therefore not a 'fair use' of the copyrighted work; it is the same question as arises in the case of any other copyrighted work."²⁶ Noting that the decision was "more troublesome" when the plagiarist borrowed an abstract of the entire work rather than copying a block of it, Judge Hand developed the now-famous abstractions test:

Upon any work, and especially upon a play, 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 play is about, and at times might consist only of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could protect the use of his 'ideas,' to which, apart from their expression, his property is never extended.²⁷

Judge Hand despaired of ever being able to fix a boundary between idea and expression, but noted that the abstractions analysis was not analogous to lifting a portion of the copyrighted work. He then proceeded to compare the two plays, beginning on a general level and proceeding to plot specifics. The judge held that if in fact there was any evidence of copying, it was of such a general nature as to be copying of unprotectable ideas rather than expression. No infringement was found.

Finally, Judge Hand anticipated what would later become one of the most disputed aspects of the substantial similarity test—the use of expert witness testimony.

24. *Nichols v. Universal Pictures Corp.*, 45 F.2d 119 (2nd Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

25. *Id.* at 121.

26. *Id.*

27. *Id.*

We cannot approve the length of the record, which was due chiefly to the use of expert witnesses . . . (expert testimony) ought not to be allowed at all; and while its admission is not a ground for reversal, it cumbers the case and tends toward confusion, for the more the court is led into the intricacies of dramatic craftsmanship, the less likely it is to stand upon the former, if more naive, ground of its considered impressions upon its own perusal.²⁸

While not explicitly articulating it, Learned Hand expressed a preference for substantial similarity to be judged from the perspective of the intended audience of the work. He recognized that expert testimony could be used to confuse a similarity analysis because of the infinite number of levels of abstraction which could be brought into a case, given the ingenuity and motivation of the expert witness.

B. THE TEST REFINED

The Second Circuit, with Judge Hand in the majority but Judge Frank writing the opinion, had occasion to refine the substantial similarity test in *Arnstein v. Porter*.²⁹ Arnstein alleged that Cole Porter had copied a number of the plaintiff's musical compositions. Plaintiff presented no direct evidence of copying, but relied on the access and similarity test previously discussed.

The court first noted that if evidence of access was lacking, similarities between the works must be so striking as to preclude the possibility of independent creation. It went on to establish a bifurcated infringement test:

If there is evidence of access and similarities exist, then the trier of facts must determine whether the similarities are sufficient to prove copying. On this issue, analysis ('dissection') is relevant, and the testimony of experts may be received to aid the trier of facts . . . If copying is established, then only does there arise the second issue, that of illicit copying (unlawful appropriation). On that issue . . . the test is the response of the ordinary lay hearer; accordingly, on that issue, 'dissection' and expert testimony are irrelevant.³⁰

The test thus involved a threshold analysis of copying, evidenced by similarity, and upon which expert testimony could be received. If copying were established, the trier of fact was then required to determine if the copying was illicit without resort to expert testimony. As Judge Frank wrote:

[T]he proper criterion on that issue is not an analytic or other comparison of the respective musical compositions as they appear on paper or in the judgment of trained musicians. The plaintiff's legally protected in-

28. *Id.* at 123.

29. 154 F.2d 464 (1946).

30. *Id.* at 468.

terest is not, as such, his reputation as a musician but his interest in the potential financial returns from his compositions which derive from the lay public's approbation of his efforts. The question, therefore, is whether defendant took from plaintiff's works so much of what is pleasing to the ears of lay listeners, who comprise the audience for whom such popular music is composed, that the defendant wrongfully appropriated something which belongs to the plaintiff.³¹

The *Arnstein* court suggested that expert testimony would be admitted on misappropriation only if it assisted in determining the reactions of lay auditors. "The impression made on the refined ears of musical experts or their views as to the musical excellence of plaintiff's or defendant's works are utterly immaterial on the issue of misappropriation; for the views of such persons are caviar to the general—and plaintiff's and defendant's compositions are not caviar."³²

Aside from this unsolicited musical criticism, *Arnstein* suffers from an analytical flaw which proves to be troublesome to this day (*Arnstein* is still followed by some courts).³³ The *Arnstein* court did not address why informed intellectual comparison is appropriate to the first prong of the test, copying, but inappropriate to the second prong, misappropriation. Presumably, such a bifurcated test allows a plaintiff to survive summary judgment by providing expert testimony of similarity that might otherwise not be obvious, and thus establishing copying. Such was the case in *Arnstein*. The matter is then decided by the lay observer, who is in the best position to decide if the misappropriation has had its intended effect.

The problem, however, is two-fold. First, as the dissent in *Arnstein* noted, the court made no real effort to distinguish between legitimate copying and misappropriation. "If there is actual copying, it is actionable, and there are no degrees; what we are dealing with is the claim of similarities sufficient to justify the inference of copying. This is a single determination to be made intelligently, not two with the dominating one to be made blindly."³⁴

Second, the practical effect of the bifurcated test is not to discourage the use of unwieldy expert testimony, but rather to necessitate it in satisfaction of the first prong, while expecting the finder of fact to ignore it in the second prong. A judge or jury is functionally asked to believe the

31. *Id.* at 473.

32. *Id.*

33. See e.g. *Dawson v. Hinshaw Music, Inc.*, 905 F.2d 731 (4th Cir. 1990), *cert. denied*, 498 U.S. 981. *Dawson* also discusses the *Arnstein* ordinary observer test for substantial similarity as applied to computer copyright infringement actions, concluding that *Arnstein* implicitly requires care in the choosing of an ordinary observer. *Id.* The average judge or jury might not typify the ordinary observer of a computer program. *Id.* at 736.

34. *Arnstein*, 154 F.2d at 476.

experts when they say that there has been copying, and then promptly forget what they have been told when determining if there was illegal copying. This expectation is impractical at best, and farcical at worst.

One commentator has rather charitably described the *Arnstein* first prong as follows: "the issue is merely whether the copyrighted work was used in creating the alleged copy, not whether the expression of the copyrighted work was appropriated."³⁵ Root interprets the court's use of the word "copy" in the first prong of the test in its practical sense—the defendant's use of the copyrighted work in preparing the allegedly infringing work.

The problem with this interpretation, of course, is that once literal copying has been found, the copyright laws require no further inquiry. Substantial similarity is a test designed to allow the plaintiff a method of proof where literal copying cannot be proved.

IV. SUBSTANTIAL SIMILARITY—THE CURRENT STATE

A. *KROFFT* AND THE INTENDED AUDIENCE

In spite of its flaws, the *Arnstein* test continues to be influential, especially as refined by the Ninth Circuit in 1977.³⁶ In *Krofft*, plaintiffs sued for infringement of their copyrighted children's television show "H.R. Pufnstuf." The Kroffts alleged that McDonald's "McDonaldland" characters were copies of the characters in their television show.

Direct evidence of copying was, as usual, lacking. Access was, however, easy to prove. When McDonald's developed its McDonaldland ad campaign, "H.R. Pufnstuf" was already a very successful Saturday morning children's show. In fact the advertising agency that developed the McDonaldland campaign contacted the Kroffts to seek their permission to use the Pufnstuf characters. Negotiations broke down, and the agency told the Kroffts that McDonald's had tabled the idea. In fact, the campaign was near completion. The agency hired several former Pufnstuf employees to design costumes for the commercials, as well as the expert who provided all the voices of the Pufnstuf characters.

After the advent of the McDonaldland campaign, the Kroffts were unable to extend existing license agreements for related merchandise, and the McDonaldland characters actually replaced the Pufnstuf characters in the Ice Capades. There was some evidence that third parties believed that McDonald's had received licenses from the Kroffts for the McDonaldland characters.

35. Root, *supra* note 8, at 1279.

36. Sid & Marty Krofft Television Productions, Inc. v. McDonald's Corp., 562 F.2d 1157 (9th Cir. 1977).

The court cited Learned Hand's abstractions test, articulated in *Nichols*, for the proposition that protected expression must be distilled from unprotectable idea.³⁷ The difficulty, the court wrote, was applying the test for infringement with the idea/expression dichotomy in mind. "But there also must be substantial similarity not only of the general ideas but of the expressions of those ideas as well."³⁸

Building on the *Arnstein* test for substantial similarity, the court held that the first inquiry was to be the similarity of ideas, to be decided by the trier of fact:

We shall call this the 'extrinsic test.' It is extrinsic because it depends not on the responses of the trier of fact, but on specific criteria which can be listed and analyzed. Such criteria include the type of artwork involved, the materials used, the subject matter and the setting for the subject. Since it is an extrinsic test, analytic dissection and expert testimony are appropriate. Moreover, this question may be decided as a matter of law.³⁹

Next the court moved to the subtle and complex determination of substantial similarity between expression in the two works:

The test to be applied in determining whether there is substantial similarity in expressions shall be labeled an intrinsic one depending on the response of the ordinary reasonable person. It is intrinsic because it does not depend on the type of external criteria and analysis which marks the extrinsic test . . . analytic dissection and expert testimony are not appropriate.⁴⁰

The *Krofft* court decided that in referring to copying that did not infringe, the *Arnstein* court must have been referring to the copying of ideas rather than expression.⁴¹ Thus it wrote that "we believe that the court in *Arnstein* was alluding to the idea-expression dichotomy which we make explicit today."⁴²

The extrinsic test for similarity of expression was especially pertinent in *Krofft*, the court added, because the intended audience for both sets of products was children. "It was in recognition of the subjective and unpredictable nature of children's responses that defendants opted to recreate the H. R. Pufnstuf format rather than use an original and unproven approach."⁴³ Thus the intrinsic test requires the trier of fact to

37. *Id.* at 1163.

38. *Id.*

39. *Id.* at 1164.

40. *Id.*

41. The *Krofft* court anticipated the now-prevalent abstraction-filtration-comparison test of *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2nd Cir. 1992). See *infra* note 70 and accompanying text (discussing extensively *Altai's* abstraction-filtration prongs). The *Krofft* "extrinsic" test is a rough combination of *Altai's* abstraction-filtration prongs.

42. *Krofft*, 562 F.2d at 1163.

43. *Id.* at 1166.

place itself in the shoes of the ordinary person, which in this case meant the ordinary child consumer of Saturday morning television and hamburgers.

The court affirmed the finding of substantial similarity, and its extrinsic/intrinsic test for substantial similarity held sway for over a decade. The court did not attempt to explain why a detailed analysis of similarity of idea had to precede the more visceral analysis of similarity of expression. It did not address the seeming inconsistency of allowing detailed and complicated expert testimony on the more general issue of similarity of idea, while excluding it for the more complex issue of similarity of expression.⁴⁴

Given the court's holding that expert testimony may only be used to find similarity of idea, and that the extrinsic test may be decided as a matter of law, only defendants may use experts as competent final summary judgment evidence. A finding of substantial similarity of idea only allows a plaintiff to continue in the suit, to attempt to prove similarity of expression. Thus at most a plaintiff could seek partial summary judgment on the issue of similarity of ideas. A defendant, on the other hand, may obviate the need for further proceedings, successfully showing by expert evidence that the ideas at issue are not similar.

While the court would presumably respond that if the ideas are not substantially similar, their expression cannot be, such an analysis is not a given. As the *Krofft* court notes, the intended audience in the case, and the one whose reactions are admittedly unpredictable and idiosyncratic, are children. Similarity of expression, which is after all the only protectable element in an action for copyright infringement, will have the desired effect regardless of whether the underlying idea is similar. In fact, if the two cannot be distinguished, then there is no need for a bifurcated test. This problem and others have been addressed in recent cases which discuss substantial similarity in the context of computers and copyright.

B. SUBSTANTIAL SIMILARITY AND COMPUTER PROGRAMS

The *Krofft* court settled on the total look and feel of the two sets of characters when deciding the question of infringement. This approach presented obvious problems in the context of computer programs. "The absence of an easily perceived general aura or feeling emanating from a silicon chip has led some commentators to suggest an 'iterative' approach

44. In the context of the non-literal elements of a computer program, the reverse is true. Separating idea from expression, given the strictures of the process of programming, is the more complex task. As more fully discussed *infra*, the *Krofft* court may be misguided on its facts, but prescient when the same reasoning is applied to infringement of non-literal program elements.

to substantial similarity."⁴⁵

Johnson represents a good example of case law response to the intricacies of the ordinary observer test set out in *Krofft*. "The ordinary observer test has proven 'one of the most difficult questions in copyright law, and one which is the least susceptible of helpful generalization.'"⁴⁶

Under the iterative approach, adopted in form if not name by several courts, the fact finder's focus shifts from the hypothetical ordinary observer's impressions of the total concept and feel of the copyrighted and allegedly infringing works to an analysis of the 'quantitative and qualitative evidence of similarities' as gauged by the Court's evaluation of expert testimony. The fiction of the lay observer is thus abandoned in favor of an analysis of similarities and differences in the copyrighted and allegedly offending computer programs.⁴⁷

The *Johnson* case involved the not-uncommon scenario of the allegedly infringing programmer seeking to create a program compatible with the protected program. The bifurcated test of *Krofft* was not completely scrapped, but the iterative test was inserted where the *Krofft* court had applied the intrinsic prong of its test. *Johnson* thus represented a compromise between use of the lay observer test and complete reliance on expert testimony.

Lack of access to expert testimony in the crucial second phase of the test had proven unworkable in the context of computer programs. "Since there are no ordinary observers of computer programs, the application of the ordinary observer test to judge similarities in computer programs would be an entirely fictitious process."⁴⁸ Frequently, the most probative evidence of copying can only be discovered by reference to expert opinion, because the copying may not be observable solely by looking at the program's output.

The emphasis on the iterative test is thus on direct copying, a form of infringement previous courts had largely passed over as too difficult of proof:

Unlike most fields of endeavor covered by the copyright laws, the imitation and stepping-stone progress in computer programs requires plagiarizing in some manner the underlying copyrighted work . . . one cannot slightly modify the copyrighted program's procedure without first recreating in some manner the original program's expression. A new innovator must therefore plagiarize and apply much of the original operating system to the new 'fixed' computer program in order to add a new improvement.⁴⁹

45. *E.F. Johnson Co. v. Uniden Corp. of America*, 623 F. Supp. 1485, 1493 (D. Minn. 1985).

46. *Id.* at 1492 quoting 3 NIMMER ON COPYRIGHT, *supra* note 18, at § 13.03[A].

47. *Johnson*, 623 F. Supp at 1493.

48. *Root*, *supra* note 8, at 1286.

49. *Id.* at 1292-93.

Too liberal an application of the look and feel, ordinary observer prong of the traditional substantial similarity test could lead to overprotection of programs, tipping the scales in favor of protection over competition. Nonetheless, it was not until 1986 that a court of appeals explicitly abandoned the bifurcated test of *Krofft* and *Arnstein*.⁵⁰

V. VARIATIONS—*WHELAN v. JASLOW*

A. THE CASE

Whelan is a seminal case in the area of substantial similarity, and though it has been discredited to some degree, it is worth study not only for its continued limited vitality, but for the depth with which it approaches the substantial similarity problem. The developer of a custom program for the keeping of records in a dental office brought an infringement action against the office for which the program was developed, resulting from the development of a similar program in a different computer language.

The developer had, in his spare time, developed a program written in BASIC that performed essentially the same functions as the one he had written for Jaslow, but would have wider use because its language was more commonly used in the computers of the businesses that could use such a program. Jaslow retained ownership of the original program, with a license-back provision to Whelan. Whelan marketed the BASIC program in apparent violation of the license agreement and of Jaslow's copyright, and this litigation ensued.

The court cited both *Arnstein* and *Krofft* for the standard proposition that, in the absence of evidence of direct copying, a plaintiff could prove access and substantial similarity. Noting that the district court in this case had not used the bifurcated standard for receipt of expert testimony required by *Krofft* (another 3rd Circuit case), the court nonetheless held that the district court had applied an appropriate standard. "The ordinary observer test, which was developed in cases involving novels, plays, and paintings, and which does not permit expert testimony, is of doubtful value in cases involving computer programs on account of the programs' complexity and unfamiliarity to most members of the public."⁵¹ The court recognized that the *Krofft* ordinary observer test required the finder of fact to ignore expert evidence received in the first prong when determining the second. "Especially in complex cases, we doubt that the 'forgetting' can be effective when the expert testimony is essential to even the most fundamental understanding of the objects in question."⁵²

50. *Whelan Assoc., Inc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222, 1231-32 (3rd Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

51. *Id.* at 1232.

52. *Id.*

The court decided to join what it termed "the growing number of courts" to abandon the bifurcated substantial similarity test in favor of a single inquiry in which both lay and expert testimony would be admissible. It cited *Johnson*⁵³ and three other cases which did not announce abandonment of the old test, but nonetheless relied entirely on expert testimony to determine similarity.

Perhaps most importantly, however, *Whelan* stands for the proposition that non-literal elements of a computer program may be protected by copyright, thus necessitating a preliminary evaluation of what is and is not protectable under the idea/expression dichotomy. The dichotomy is in that sense inseparable from the substantial similarity test, because something must be within the scope of a copyright for its similarity to constitute infringement.

The *Whelan* court then picked up a ball that had been fumbled by virtually every court that had been unable to improve on Judge Learned Hand's famous test—it postulated a test for distinguishing between idea and expression:

In other words, the 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 the 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.⁵⁴

The unprotectable idea in this case, the court wrote, was the efficient management of a dental lab. Because such an idea could be accomplished in a variety of different ways, the structure of the protected program was expression and thus protectable.

B. THE AFTERMATH

Whelan has been roundly criticized for being overbroad on this point. One leading commentator has stated that "the crucial flaw in [Whelan's] reasoning is that it assumes that only one 'idea,' in copyright law terms, underlies any computer program, and that once a separable idea can be identified, everything else must be expression."⁵⁵ The enumerated flaw stems from a failure to account for the structure of computer programs, and more specifically their division into numerous subroutines, each of which may have a discrete function or purpose. No computer program can be said to be made up of one idea, at least on a functional level.

Whelan's collapsing of the bifurcated test, allowing expert testimony in all phases, has not been unanimously embraced by the courts. In

53. 623 F. Supp 1485.

54. *Id.* at 1236.

55. 3 NIMMER ON COPYRIGHT, *supra* note 18, at § 13.03[F].

Gates Rubber Co. v. Bando American, Inc.,⁵⁶ the district court was asked to issue a permanent injunction keeping the defendant from using a program similar to plaintiff's program designed to aid in the selection of replacement belts. The plaintiff alleged copyright infringement.

The court began its analysis by revisiting old territory, beginning with *Baker v. Selden*,⁵⁷ the 1879 Supreme Court case distinguishing idea from expression. It proceeded to derive its test for substantial similarity from the *Nichols*, *Arnstein*, and *Krofft* line of cases, emphasizing the difference between the first and second prongs of the test. Within the strictures of the bifurcated extrinsic/intrinsic test, the court gave considerable weight to expert testimony. "Because the court appreciates the importance and technical nature of the expert testimony here, it will give substantially greater weight to the extrinsic prong of the two-step test. The second prong of the test will be limited dramatically."⁵⁸

Recognizing the highly technical nature of computer programs and their components, the court reduced its consideration of the intrinsic prong to one paragraph, and that paragraph came with the disclaimer that the "undersigned judge (was) largely unfamiliar with computers and their processes." The *Gates Rubber* court did make an interesting contribution to the law of substantial similarity, however, by adding the Learned Hand abstractions test as a sort of third prong.

"It seems only logical that this type of analysis would be undertaken after the application of the substantial similarity test, at which time the fact-finder has determined whether the work is a 'plagiarizing work' of the copyrighted work."⁵⁹ The defendants urged that the court apply the abstractions test before the two part substantial similarity test, but the court rejected the proposition on the ground that such a process would

eviscerate the prevailing application of the substantial similarity test as defined by *Whelan* and its progeny, and in return offer[] little in the way of establishing any more workable alternative. In addition, the application of the abstractions test, not instead of, but in addition to the two-step test, serves as a guard against unprotectable elements being considered in the legal conclusion of whether there is infringement [based on the factual considerations of the extrinsic and intrinsic tests].⁶⁰

Good intentions of the court aside, this analysis is a clear misapplication of *Whelan* and the law from which it was derived. The bifurcated substantial similarity test was designed specifically to filter out unprotectable idea from protectable expression as a preliminary matter. The

56. 798 F. Supp. 1499 (D. Colo. 1992).

57. 101 U.S. 99.

58. *Id.* at 1513-14.

59. *Id.* at 1516.

60. *Id.*

difference between idea and expression is a question of law, not fact. Given the *Gates Rubber* court's decision to apply the bifurcated test, the court must take expert testimony only as to the first prong of that test. Thus the intrinsic or second prong analysis will of necessity involve consideration of both ideas and expression by non-experts.

In the case itself this presented little problem, given the cursory manner in which the intrinsic prong of the analysis was undertaken. The difficulty lies in the precedent the *Gates Rubber* court has or has not provided. The idea behind the bifurcated test was to sift out unprotectable matter from that which could be protected, and to then allow an intended audience to compare protectable expression for evidence of infringement. The *Gates Rubber* version collapses the two prongs together (as did *Whelan*), adds a useless second prong, and then adds a third test which heretofore had been performed as part of the first prong.

A more interesting (if less fully fleshed-out), attempt to develop a satisfactory test for substantial similarity was made by the Western District of Oklahoma in 1990.⁶¹ In *Micro Consulting*, plaintiff brought a copyright infringement claim to protect its program for processing health insurance claims. The court noted in passing that only similarity between protectable original expression taken from an existing work is contemplated by the copyright laws, and that extant tests all contained a means of both separating idea from expression and comparing the two works at issue.⁶²

The court recognized the lack of a uniform method for distinguishing idea from expression. It listed the abstraction test of *Nichols*, the total concept and feel test (most notably of *Krofft*), the iterative test of *E. F. Johnson*, and the structure, sequence and organization test of *Whelan*. While the total concept and feel test was deemed too imprecise for computer copyright cases, the *Micro Consulting* court also found the *Whelan* test to be inadequate for overbreadth. It therefore settled on Learned Hand's abstractions test as the preferred method for separating idea from expression.

The *Micro Consulting* court unfortunately did little with this promising start. While it recited the differences between *Krofft* and *Whelan* with respect to admissibility of expert testimony, it proceeded to meld its inquiry into the idea/expression dichotomy with its determination of substantial similarity, without addressing the issue of receipt of expert testimony.

The court analyzed the facts of the case, progressing from the most general level of abstraction (unprotected idea) to the most specific (protectable expression). It compared the two works at each level for sub-

61. *Micro Consulting, Inc. v. Zubeldia*, 813 F. Supp. 1514 (W.D. Okla. 1990).

62. *Id.* at 1526-27.

stantial similarity, finding none at the level of protectable expression. Expert testimony was evidently considered with respect to similarity of expression, but the court provided no detailed account of its own deliberative process to help other triers of fact. The court's melding of the abstractions and substantial similarity tests is unwieldy, and its use of both expert testimony and its own impressions regarding similarity provide no clue as to what might be the appropriate evidentiary standard.

VI. ATARI AND ALTAI—THE CUTTING EDGE

A. ATARI V. NINTENDO

Thankfully, two recent courts of appeals decisions have provided some guidance to the courts, with respect to both the use of experts in the substantial similarity test and proper use of the abstractions test. In *Atari Games Corp. v. Nintendo of America, Inc.*,⁶³ one computer game company sued another for copyright infringement. Atari was a Nintendo licensee. Nintendo had designed a program which acted as a security device, preventing the use of unauthorized game cartridges in its console unit. Atari had sought the license with Nintendo in order to gain access for its games into Nintendo console units. Atari chafed at the restrictions imposed by the license, and sought to develop a program which would imitate the Nintendo security program, thus allowing more Atari games to be played on Nintendo consoles.

Atari wrongfully obtained the Nintendo program's source code from the Copyright Office, and proceeded to chemically peel the chips to read the object code. They were successful, and this litigation ensued. The court analyzed the likelihood that Nintendo would prevail on an infringement action.

Dusting off Judge Learned Hand's venerable abstractions test from *Nichols*, the court noted that the first step in such a test was to separate the programs into manageable components, in recognition of the structure of computer programs. The next step was to filter ideas and unprotectable expression from protectable expression.

A brief outline of expression that is not protectable is appropriate at this point. First, expression that is necessarily incidental to the idea being expressed is not protected under the doctrine of merger.⁶⁴ *Baker v. Selden* held that the expression of headings and columns was necessarily incidental to the idea of the accounting book, is a good example of merger.⁶⁵ "When there is essentially only one way to express an idea,

63. 975 F.2d 832 (D.C. Cir. 1992).

64. *Manufacturers Technologies, Inc. v. Cams, Inc.*, 706 F. Supp. 984, 996-97 (D. Conn. 1989).

65. *Baker*, 101 U.S. at 107.

the idea and its expression are inseparable and copyright is no bar to copying that expression."⁶⁶

Expression necessarily dictated by external factors may not be protected, under a doctrine known as *scenes a faire*.⁶⁷ This doctrine has most often been used in the context of literary works. Where "it is virtually impossible to write about a particular historical era or fictional theme without employing certain 'stock' or standard literary devices,"⁶⁸ the expression is not protected. One commentator observed that "in many instances it is virtually impossible to write a program to perform particular functions in a specific computing environment without employing standard techniques."⁶⁹ Limiting factors may include mechanical specifications of the computer, compatibility requirements of other companion programs, or even acceptable programming practices within the industry.

Expression found in the public domain is also not protectable, even when included in a copyrighted work. In the computer context, this would apply to programs that have entered the public domain through freely accessible program exchanges and the like.⁷⁰

The *Atari* court then evaluated the copyrighted program using the foregoing tests, and held that none kept what was otherwise protectable expression from being covered by the copyright. Once past this threshold, the court considered whether Atari had made a literally infringing copy, or one substantially similar (as noted, access was easy to prove).

Refusing to follow the *Whelan* test without comment, the court applied the bifurcated standard derived from *Arnstein* and *Krofft*, but with a twist. The court first applied an extrinsic test to determine whether the ideas were substantially similar. (Recall that according to the *Krofft* line of cases, expert testimony is only permissible in this prong.) The court then used the intrinsic test, which depends on the response of the ordinary reasonable person. In a compromise seemingly dictated by *stare decisis*, the court retained the ordinary reasonable observer standard, but changed the definition of that observer:

In the context of computer programs, the 'ordinary reasonable person' with the ability to intelligently respond to computer expression is a computer programmer. Thus, in addition to the lay response of a fact-finder, the Ninth Circuit permits expert testimony about the second

66. *Concrete Machinery Co. v. Classic Lawn Ornaments, Inc.*, 843 F.2d 600, 606 (1st Cir. 1988).

67. *Computer Assoc. Int'l v. Altai, Inc.*, 982 F.2d 693, 709 (2nd Cir. 1992).

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

69. 3 NIMMER ON COPYRIGHT, *supra* note 18, at § 13.03[F][3].

70. *Computer Assoc. International, Inc. v. Altai, Inc.*, 982 F.2d 693, 710 (2nd Cir. 1992).

prong of the substantial similarity test.⁷¹

The *Atari* court did not explain the extent to which a lay response would in fact be considered, given that a computer programmer seems to be the sole possessor of the ability to intelligently respond to computer expression. By retaining at least nominally the ordinary observer standard, the court avoided reversing Ninth Circuit precedent. It did, however, leave itself open to aspersions of hypocrisy.

B. *COMPUTER ASSOCIATES V. ALTAI*

Atari drew heavily on *Computer Assoc. Int'l v. Altai, Inc.*⁷² for its analysis of both the idea/expression dichotomy and the substantial similarity test. *Altai* is much the better-reasoned opinion. In *Altai* a Computer Associates employee left to work for Altai. He took with him the source code for a program called ADAPTER, which he used to develop a similar program called OSCAR. Computer Associates alleged copyright infringement.

For purpose of analysis, both the district court and the Second Circuit assumed access. The court went out of its way to condemn the substantial similarity analysis of *Whelan*, opining that it "relies too heavily on metaphysical distinctions and does not place enough emphasis on practical considerations."⁷³ Conceding that *Whelan* was the most thoughtful attempt at addressing the problem in the context of computer programs, it nonetheless developed a new test it described as abstraction-filtration-comparison.⁷⁴

The *Altai* test is indeed well-considered.⁷⁵ First, the trier of fact analyzes the allegedly copied program and isolates each level of abstraction within it. "This process begins with the code and ends with an artic-

71. *Atari*, 975 F.2d at 844 citing *Johnson Controls, Inc. v. Phoenix Control Systems, Inc.*, 886 F.2d 1173, 1176 n.4 (9th Cir. 1989).

72. 982 F.2d 693 (2nd Cir. 1992).

73. *Id.* at 707.

74. While the *Altai* court is generally credited with developing the abstraction-filtration-comparison test, the court itself "endorse[d]" Professor Nimmer's three-part test. *Id.* at 707. Nimmer originally proposed the test in his treatise on copyright as a way to "help a court separate ideas [and processes] from expression and eliminate from the substantial similarity analysis those portions of the work that are not eligible for copyright protection." *Mitek Holdings, Inc. v. ARCE Engineering Co., Inc.*, 864 F.Supp. 1568, 1577 citing 3 NIMMER ON COPYRIGHT, *supra* note 18, at § 13.03[F].

75. The *Altai* Court's three-pronged test also owes much to Judge Keeton's infringement analysis in *Lotus Development Corp. v. Paperback Software Int'l*, 740 F. Supp. 37 (D. Mass. 1990). The *Lotus Development* court formulated its own three-part test based on the idea/expression dichotomy: first, the program was abstracted to eliminate its unprotectable ideas; next, the court pared expression it found essential to those ideas; finally, the court determined whether the remaining expression was a substantial part of the copyrighted work. *Id.* at 59-70.

ulation of the program's ultimate function."⁷⁶ The analysis is completed in reverse order of the programmer's steps.⁷⁷

The court then moves to the second step—filtration. The structural components at each level of abstraction are examined to determine whether their inclusion at that level was "idea," or unprotectable expression by application of the doctrines of merger, *scenes a faire*, or public domain. Strictly speaking, this filtration serves the purpose of defining the scope of the plaintiff's copyright and may ultimately leave behind a core of protectable material.⁷⁸ The court thus eliminates all unprotected material, and is theoretically left with a kernel of protected material that is covered by the copyright. In terms of a work's copyright value, this is the golden nugget. At this point, the court's substantial similarity inquiry focuses on whether the defendant copied any aspect of the protected expression, as well as an assessment of the copied portion's relative importance with respect to the plaintiff's overall program.⁷⁹

In the spirit of thoroughness, the *Altai* court also tackled the issue of admissibility of expert testimony, but with less convincing results:

We believe that the trier of fact need not be limited by the strictures of its own lay perspective. Rather, we leave it to the discretion of the district court to decide to what extent, if any, expert opinion, regarding the highly technical nature of computer programs, is warranted in a given case.⁸⁰

The district court's "discretion" seems to provide nothing more than a Hobson's choice. The court was more concerned with maintaining the role of the lay observer in the more traditional copyright contexts of music or literature.

VII. POST-*ALTAI*—RECENT DEVELOPMENTS

A number of courts, recognizing the need to refine the test for copyright infringement in the context of computer programs, and grateful for the framework of *Altai*, have tackled the substantial similarity problem. In *Gates Rubber*, one of the first and most ambitious post-*Altai* cases, the court accepted *Altai's* basic three-part analysis but sought to "elaborate

76. *Altai*, 982 F.2d at 707.

77. One court has noted that a computer program can be dissected into six levels of decreasing abstraction: (1) the main purpose; (2) the program structure or architecture; (3) the modules; (4) algorithms and data structures; (5) source code; and (6) object code. *Gates Rubber*, 9 F.3d at 835 citing John W.L. Ogilvie, *Defining Computer Program Parts Under Learned Hand's Abstractions Test in Software Infringement Cases*, 91 MICH. L. REV. 526 (1992).

78. *Altai*, 982 F.2d at 709.

79. *Id.*

80. *Id.* at 713.

upon the various steps and to clarify the role of the abstraction test."⁸¹ The *Gates Rubber* court proposed, without adequate discussion, that the three prong *Altai* test be preceded by:

an initial holistic comparison [which] may reveal a pattern of copying that is not obvious when only certain components are examined. . . We suggest that a court will often be assisted in determining the factual issue of copying if both programs are first compared in their entirety without filtering out the unprotected elements. Such a preliminary step does not obviate the ultimate need to compare just the protected elements of the copyrighted program with the alleged infringing program.⁸²

The *Gates Rubber* court recognized the essential flaw in *Altai*: each layer peeled from a copyrighted program makes the program less recognizable to its intended consumer. That intended consumer, however, is the ultimate judge of the value of copyright ownership. This is the "pattern of copying" that "holistic comparison" would reveal.

Unfortunately, the *Gates Rubber* court abandons its suggested initial comparison at the threshold. The case contains no further discussion, and in fact is remanded for reconsideration in large part because the district court failed to filter out unprotectable elements from the copyrighted program.

Rather than proposing an *initial* holistic comparison, the court in *Mitek Holdings, Inc. v. ARCE Engineering Co., Inc.*,⁸³ proposed an *additional* step following the comparison part of *Altai*.⁸⁴ The *Mitek* court endorsed *Altai*'s abstraction-filtration-comparison test.⁸⁵ Not content to stop at comparison of the protectable core of the two programs, the court suggested a fourth step: if it found substantial similarity, it would then determine if the defendant misappropriated a "substantial portion" of the copyrighted program.⁸⁶

81. *Gates Rubber*, 9 F.3d at 841. In *Gates Rubber* the owner of a software copyright sued to permanently enjoin a competitor from using an allegedly infringing program. *Id.* at 831. The district court found copyright infringement and misappropriation of trade secrets. *Id.* The court of appeals held that the district court failed to determine the protectability of many of the elements of the copyrighted program. *Id.* at 830. The court of appeals therefore remanded for reconsideration in light of the abstraction-filtration-comparison test in *Altai*. *Id.*

82. *Id.*

83. 864 F. Supp. 1568 (S.D. Fla. 1994). In *Mitek Holdings*, the holder of a copyright for a drafting program brought an infringement action against a competitor. *Id.* at 1572. The same programmer wrote the copyrighted and the allegedly infringing program, so access was not at issue. *Id.* at 1579.

84. 982 F.2d at 693.

85. *Mitek Holdings*, 864 F. Supp. at 1579.

86. *Id.*

Borrowing largely from copyright/compilation cases,⁸⁷ the court noted that “works consisting largely of uncopyrightable elements, as in the instant case, are entitled to limited copyright protection,” and that infringement should not be found in the absence of “copying or unauthorized use of substantially the entire item.”⁸⁸

The *Mitek* court believed it was refining or amplifying *Altai*'s analysis. *Altai*'s comparison prong, however, expressly includes “an assessment of the copied portion's relative importance with respect to the plaintiff's overall program.”⁸⁹

Mitek's quantitative final step is unnecessary in light of *Altai*. Moreover, it distorts the true purpose of such a step—to avoid protecting programs containing a few technical similarities, but whose similarities are *de minimus*. The analysis is not mathematical. Rather, it is designed to reflect the balance between securing a fair return for the author's creative labor and promoting free use and development of non-protectable ideas and processes.⁹⁰

The Tenth Circuit recently addressed the *Altai* test and the use of expert testimony in computer copyright infringement actions.⁹¹ In *Autoskill* the holder of a copyright for a reading system program sought a preliminary injunction. The court of appeals approved the district court's use of the *Altai* test, but declined to adopt the test until it faced appeal from a final infringement judgment.⁹² Nonetheless, the court's discussion of the use of expert testimony is enlightening. In *Autoskill*, expert testimony was used in the abstraction phase of the *Altai* test.⁹³

The *Autoskill* court's justification for using expert testimony is much better-reasoned, though the court itself does not (and perhaps could not) articulate its reasoning. The abstraction prong of the *Altai* test, in which the copyrighted program is dissected into increasing specific levels of abstraction, is uniquely susceptible of expert testimony. The *Altai* court itself likens the process to “reverse engineering on a theoretical plane.”⁹⁴ The comparison to reverse engineering is telling. No one is better

87. *Id.* at 1584. The seminal case on copyright infringement in the context of compilations is *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340 (1991). While a detailed discussion of *Feist* is beyond the scope of this paper, *Feist* is most often cited for its dismissal of the “sweat of the brow” theory of copyrightability. *Id.* at 359-60.

88. *Mitek Holdings*, 864 F. Supp. at 1584.

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

90. *Id.* at 711.

91. *Autoskill, Inc. v. National Educational Support Systems, Inc.*, 994 F.2d 1476 (10th Cir. 1993).

92. *Id.* at 1491.

93. *Id.* at 1493. *Autoskill*'s expert testified that certain elements of the plaintiff's program were so abstract as to be unprotectable, but that below those elements were levels of protectable expression. *Id.*

94. *Id.*

equipped to reverse engineer a computer program than a computer programmer. Expert testimony is therefore critical to the *Altai* test's first prong.

Once the levels of abstraction are revealed, however, filtration and comparison by the trier of fact become much more manageable. Both tasks are significantly less technical: the first, because filtration requires the fact finder to distinguish between idea and expression;⁹⁵ and the second, because comparison should be from the perspective of the intended audience.

Other recent cases to address copyright infringement, substantial similarity and the *Altai* test include: *Engineering Dynamics v. Structural Software*,⁹⁶ *Apple Computer, Inc. v. Microsoft Corp.*,⁹⁷ *Cognotec Services v. Morgan Guar. of N.Y.*,⁹⁸ *Keener-Through v. Leadership Software, Inc.*,⁹⁹ and *Lotus Development Corp. v. Borland International, Inc.*¹⁰⁰

95. Expert testimony would, however, be useful in filtering out elements dictated by efficiency, those dictated by external factors (*i.e.* the *scenes a faire* doctrine), and those taken from the public domain.

96. 46 F.3d 408 (5th Cir. 1995). The creator of a structural engineering program brought an infringement action against a competitor. *Id.* at 409. The Fifth Circuit adopted the *Altai* abstraction-filtration-comparison test, holding that input format of computer program was based on minimum level of originality and was entitled to copyright protection. *Id.* at 410.

97. 35 F.3d 1435 (9th Cir. 1994). A computer manufacturer brought an infringement action alleging infringement of its user interface. *Id.* at 1438. The Ninth Circuit held that the district court properly compared works for virtual identity, rather than substantial similarity, because the manufacturer had licensed much of its program. *Id.* at 1442. The court cites *Altai* as another court that had "dissected non-literal elements of computer programs." *Id.* at 1445.

98. 862 F. Supp. 45 (S.D.N.Y. 1994). The owner of a copyrighted program brought an infringement action against a trust company. *Id.* at 48. The district court held that allegations that protected non-literal components of computer program had been copied sufficiently stated a claim for copyright infringement. *Id.* at 49-50. The court cited and applied the *Altai* test. *Id.* The court also called the *Altai* test "necessarily fact determinative and requires detailed comparisons of computer programs." *Id.* at 50.

99. 12 F.3d 527 (5th Cir. 1994). The exclusive licensee to copyrighted management training materials brought an infringement action against the developer of a computer program. *Id.* at 531-32. The court affirmed the district court's careful juxtaposition of the programs to find a "damning similarity," and held that the *Altai* test was not absolutely necessary. *Id.* at 534. The court did, however, state that "to determine the scope of copyright protection in a close case, a court may have to filter out ideas, processes, facts, idea-expression mergers, and other unprotectable elements of those materials." *Id.* at 533-34.

100. 49 F.3d 807. The holder of copyrighted spreadsheet program and menus filed an infringement action against a competitor. *Id.* at 809-12. The court held that menu command hierarchy for computer spreadsheet program was an uncopyrightable "method of operation." *Id.* at 815.

While initially considering the applicability of the *Altai* test, the court stated, "While the *Altai* test may provide a useful framework for assessing the alleged non-literal copying

VIII. THE TEST RECONSIDERED

Altai is to be praised for its synthesis of previous case law, and for the orderly procedure with which it undertakes analysis of substantial similarity. Distillation of a given work into its copyrighted core, and only then comparison with the comparable elements of the allegedly infringing work, is an efficient use of judicial and legal resources. Use of the abstractions test is logical given that there has been no worthy successor to Learned Hand's test in the sixty-four years since *Nichols* was decided, and also given the Copyright Act's prohibition against protecting ideas.

If the reasoning of *Altai* can be faulted, it is for the court's failure to provide guidelines for the use of expert testimony in the substantial similarity analysis. The bifurcated test of *Arnstein* and *Krofft* was developed not out of populist sentiment, but out of recognition of the basic goals of the copyright laws—balancing a free market with the rights of authors to reap the benefit of their work. The ordinary observer test has never contemplated the audience that can best understand the works at issue, but rather the audience that is intended to purchase the works, to give the author those benefits for which he seeks the protection of copyright.¹⁰¹

Financial considerations underpin the Act, the copyright laws, and the substantial similarity test, as well they should. The flaw in *Altai*'s near-mandate to use expert testimony in its comparison prong is that inevitably, experts will bring to the comparison of programs an understanding that is fundamentally different from that of the person who will buy the programs. The *Krofft* court recognized that children bought the action figures and watched the television shows that drove the advertising machines, which in turn provided the benefits the Kroffts sought to safeguard. The court thus accommodated its ordinary observer test to the very different perceptions of children.

Computer programmers, on the other hand, are not necessarily (in fact very seldom) the intended consumers of a given program. Their enhanced understanding of the similarities and differences between two

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." *Id.* Instead the court took a holistic approach, inquiring whether the menu command hierarchy as a whole could be copyrighted. *Id.* at 815-16. The court added,

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.

Id. at 815.

101. For an excellent discussion of this topic, see Michael Ferdinand Sitzer, Comment, *Copyright Infringement Actions: The Proper Role for Audience Reactions in Determining Substantial Similarity*, 54 S. CAL. L. REV. 383 (1981).

programs may tell a court little about whether the allegedly infringing program is having the effect of infringement on its intended consumers.

Two responses to this criticism come immediately to mind. First, the courts have addressed this problem to a limited extent by making screen displays and user interface features separately copyrightable. Such features need not be copyrighted separately, however, so to the extent that they are part of the overall similarity analysis, an audience test would seem more appropriate. Moreover, the response begs the question. All non-literal elements, including screen displays and the like, are subject to the *Altai* analysis. In fact, *Altai* addressed only non-literal expression.

Second, computer programs are different from other works that may be copyrighted, and thus should be subject to different requirements of proof. This has the ring of truth, but also begs the question. Costume design experts in *Krofft* were able to point to a myriad of ways in which the McDonaldland characters differed from the characters in H.R. Pufnstuf, but that didn't change the bottom line—the perception of the product's consumers.

IX. A PROPOSED VARIATION

The solution is a simple one, and suggested obliquely by the court in *Altai*: keep the abstraction-filtration-comparison test, but alter the comparison prong by adding the requirement that the copyrighted core that remains be infringed from the perspective of the intended audience of the program, whether consumer of a mass-produced program or a computer programmer.¹⁰² Once the plaintiff has made a *prima facie* case for infringement, the burden of proof would then shift to the defendant to prove non-infringement. Expert testimony could then be admitted to sustain the burden.

A court should be hesitant to find that the lay public does not fairly represent a work's intended audience.¹⁰³ Programs intended for a mass audience should be compared by that audience. Programs intended for purely technical use should be compared by technicians. The minutiae of program structure and sequence may not have an overall "look and feel," but they *do* have an overall effect. That effect should be judged by the program's intended audience.

Further, expert testimony should be limited to the abstraction and filtration prongs of the test until the plaintiff has carried his initial bur-

102. This complies with the mandate of *Dawson v. Hinshaw Music Inc.*, 905 F.2d 731 (4th Cir. 1990), to supplant the "ordinary observer" nomenclature of *Arnstein*, 154 F.2d at 464, with "intended audience." Moreover, it balances the economic incentives of copyright protection with the difficulty of comparing non-literal elements of computer programs.

103. *Dawson*, 905 F.2d at 737.

den. Abstraction requires the theoretical reverse engineering of a program, and filtration requires enough substantive programming knowledge to eliminate elements dictated by efficiency, external factors, and those taken from the public domain. Expert testimony could be admitted in the comparison prong of the test only if the trier of fact has found *prima facie* infringement, and only so the defendant can sustain its burden to prove non-infringement. This balances the need to judge infringement from the intended audience's perspective with recognition that independently created computer programs may differ at a very technical level of abstraction.

The proposed test has the advantage of being more in tune with the economic incentive system of the Copyright Act, while recognizing that computer programs are complex creatures, not easily understood by the lay observer. The primary disadvantage is the test's unwieldiness, though this factor weighs no more heavily than it does in the *Altai* test itself. This is outweighed by the brighter lines of the proposed test. As the preceding history of the substantial similarity test reveals, this is an area of the law in which guidance is sorely needed.

