COPYRIGHT IN ELECTRONIC MAPS

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ABSTRACT: The Feist case raises serious problems for the copyright protection of maps, especially digitized geographic information systems. Lower courts have been struggling with various theories under which they can protect the economic value inherent in such works. All these theories suffer from serious theoretical and practical problems, largely because they seek surreptitiously to revive the "sweat of the brow" theory of copyright originality expressly rejected by Feist. Absent clarifying statutory amendment, courts are likely discard the principle that copyright protection is coextensive with the expressive originality on which copyright is based: Copyright in geographic information systems will be recognized wherever "creativity" is found, but the scope of protection will be determined through analysis of economic incentives. Copyright once again becomes an antimisappropriation tool.


Maps have always been protected by our Copyright Act. Notwithstanding this long history, however, the protection of maps still poses serious problems for both copyright theory and practice. The problems arise from the tension between the principle that maps are protected and two other basic principles: namely, that copyright does not protect facts and that copyright does not protect systems. Traditional maps are pictorial representations of geographic and demographic facts organized to allow the user to readily understand and easily extract the factual information portrayed. The factual information, such as boundary lines and locations of landmarks, is suppos-

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edly unprotected. The organizing principle for presenting the information will often, if not always, be deemed an unprotected system or idea. Thus, many maps will apparently contain only unprotected elements. Can the map "as a whole" be protected even though all the elements that comprise the map remain unprotected?

The digital age exacerbates the problem. Today's comprehensive geographic information systems may simply constitute electronically stored collections of spatial and nonspatial data, which under traditional copyright law are more naturally classified as "compilations" rather than "maps." Consequently, a theory of copyright protection for electronic maps must go beyond the traditional model of a map as a visual representation of selected geographic and other data.

The tension among traditional copyright principles as they apply to maps has been heightened by Feist Publications, Inc. v. Rural Telephone Service Company, Inc.\(^1\) This decision, as a strict matter of legal precedent, deals with factual compilations rather than pictorial maps. Nevertheless, it contains strong language purporting on constitutional grounds to limit the copyright protection of fact-based works generally—language that seems inescapably applicable to geographic information systems developed and maintained as electronic databases. The Feist decision relentlessly follows standard copyright dogma to a superficially unremarkable conclusion: copyright protects only expression, not facts; the expression protected must be the product of intellectual creativity and not merely labor, time, or money invested; the protected elements of the resulting work are precisely those that reflect this intellectual creativity, and no more. Thus, Feist requires intellectual creativity in the originality standard and maintains the relationship between that standard and the scope-of-protection, by which courts specify the elements of a protected work that remain under control of the author and those that may be freely used by others.

While it is difficult to fault Feist's formal logic,\(^2\) honest application of the decision would deny copyright protection to a variety of works whose optimal production, as a matter of social policy, may require some form of intellectual property right as an incentive. Many of these works involve compilations of rapidly changing or updated data, for which the long period

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1. 499 U.S. 340 (1991) (holding that telephone book white pages are not copyright protected because their production lacks the necessary creativity).

2. Feist's unnecessary elevation of a statutory interpretation question—what is the meaning of "compilation" in the Copyright Act?—into one of constitutional dimension is more questionable. See Dennis S. Karjala, Copyright and Misappropriation, 17 U. DAYTON L. REV. 885, 894-99 (1992); Michael G. Gerdes, Comment, Getting Beyond Constitutionally Mandated Originality as a Prerequisite for Federal Copyright Protection, 24 ARIZ. ST. L.J. 1461 (1992).
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of copyright protection in any event seems inappropriate. In these cases, short-term protection for the results of time-consuming and expensive "sweat" rather than long-term protection for literary or artistic creativity appears more consonant with overall social policy goals—that is, protection under some sort of antisamisappropriation regime.

Nevertheless, in the digital age, the misappropriation to which these works of "low authorship" are vulnerable is that of straightforward and inexpensive copying. This in turn means that state misappropriation law is likely preempted. If copyright protection is not available, such works will predictably be available for a higher price only to those relatively few purchasers whose subsequent use of the information can be controlled by contract. Works for which such limited markets provide little chance of a return of their creators' investments are not likely to be produced at all. Federal courts, recognizing the social desirability of having these kinds of works as freely available as possible, can be expected to struggle to ensure that the law does not create disincentives to production. They will seek to bring these works back under the copyright umbrella, despite the dictates of the Supreme Court in Feist. That is, the courts can be expected to try to use copyright as an antisamisappropriation tool. The result can be "fairer" in an individual case in the sense that a determination of copyright infringement makes the appropriation unlawful, but it may distort traditional copyright principles and even lead to problems of overprotection.

Not surprisingly, the federal courts are now struggling with this very problem. This article begins by examining the creation disincentives that Feist has engendered. It then analyzes three new theories that the post-Feist cases have developed to deal with the problem: (1) the "sweat of the brain" theory; (2) finding copyright creativity in an organizational scheme or principle, and (3) the recent effort of the Second Circuit to separate the

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5. Compilations are copyright subject matter, even if a particular compilation is not copyright protected for want of creativity. Moreover, copying is one of the exclusive rights recognized by the Copyright Act. See 17 U.S.C. § 301; Karjala, supra note 2, at 897 & n.47; Jane C. Ginsburg, No "Sweat"? Copyright and Other Protection of Works of Information After Feist v. Rural Telephone, 92 Colum. L. Rev. 338, 358 (1992); Robert A. Gorman, Fact or Fancy? The Implications for Copyright, 29 J. Copr. Soc'y 360, 598-610 (1982).
originality upon which a copyright is recognized from the scope of protection afforded to a copyright-protected work. These theories suffer from serious deficiencies, largely because they seek to resurrect the “sweat of the brow” theory that Feist condemned. Consequently, the article concludes that a new approach is necessary for the protection of maps, especially digitized geographic information systems. In the long run, that approach may require either a statutory amendment to the definition of “compilation” under the Copyright Act or the adoption of a sui generis database-protection statute.

I. CREATION DISINCENTIVES AFTER FEIST

Feist leaves a number of desirable works without meaningful legal protection, even though they can be costly to create but cheaply and rapidly copied. Under Feist, a factual compilation is protected only if, and only to the extent that, its author displays intellectual creativity either in the selection of the facts contained or in their arrangement as presented. An electronic database, of course, presents no “arrangement” to its user (as opposed to the user interface presented by the computer program that organizes and searches the database), so under an honest reading of Feist a complete (nonselective) factual database would be wholly unprotected by copyright. The same would be true for “attribute” (or demographic) data collected pursuant to some standardized selection scheme and stored in a computer. “Barebones” pictorial maps showing only standard features also present nothing but a routine arrangement of factual information—even when they are the result of painstaking and costly surveys or other data-gathering. If Feist applies to these maps, they will be denied copyright protection even against slavish takings, such as photocopying.

It would not help the creators of barebones maps very much to add “creative” features of style or color to their maps, because even if the features are sufficiently creative to qualify the map for copyright, the scope of protection under Feist will cover only the unnecessary and perhaps unwanted features. The factual information concerning the relative locations of geographic features could be freely taken, even by tracing (as long as the protected features are avoided). The absence of meaningful copyright protection means no legal protection for these kinds of works at all, except to the extent that creators can keep works confidential and can control their use by contract. Knowing this, potential creators would not be expected to

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7. Professor Ginsburg has pointed out that the digital age may allow such creators a degree of control not possible earlier by making the work available only “on line” and subject to restrictions to which the user must agree before receiving access. If such contracts are enforceable, they may upset the careful balance of authors’ and users’ rights that has evolved
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undertake the investment necessary to produce works that must be publicly distributed in order to recoup investment costs with a fair return. Moreover, where such works are produced, we should expect their creators to control use by limiting distribution, which means a higher unit cost to those buying the work and a lower overall availability.

A number of pre-Feist courts sensed the vulnerability of such fact-based works to misappropriation and sought to afford them copyright protection. Maps, in fact, posed little problem for most pre-Feist courts, because of their explicit inclusion in the list of protected works under the Copyright Act. Courts often protected factual compilations, even in the face of a demonstrated failure of creativity in the selection or arrangement of their contents. These courts found the necessary copyright originality in the "industrious collection" or "sweat of the brow" expended by their creators, but rarely articulated the relationship between the originality that justified copyright protection and the scope of that protection. Moreover, the approach flatly ran counter to the statutory definition of a "factual compilation," which specifically relates the originality requirement for compilations to selection, coordination, or arrangement of the data or preexisting materials that the compilation contains. This "sweat of the brow" approach to originality was the subject of much critical commentary, and the Supreme Court expressly disproved of it in Feist.

Vulnerability to misappropriation, however, does not go away simply by waving a magic wand, even when the United States Supreme Court plays


8. The major pre-Feist issue for maps concerned whether only maps that were the product of the mapmaker’s own data collection were protected or copyright extended also to original compilations of preexisting maps. Compare Amsterdam v. Triangle Publs., Inc., 189 F.2d 104 (3d Cir. 1951) with United States v. Hamilton, 583 F.2d 448 (9th Cir. 1978).

9. Section 102(a)(5) of the Copyright Act includes “pictorial, graphic, and sculptural works” within the category of works of authorship, which means they are copyright protected if they are original and if no other limitation on copyright applies, such as the merger doctrine, the scènes à faire doctrine, and the rule of Baker v. Selden, 101 U.S. 99 (1880) (establishing functionality as the dividing line between copyright and patent). “Pictorial, graphic, and sculptural works” are defined to include “maps.” 17 U.S.C.A. § 101 (definition of “pictorial, graphic, and sculptural works”).


11. “A ‘compilation’ is a work formed by the collection and assembling of preexisting materials or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship.” 17 U.S.C.A. § 101.

the magician. Many judges react almost instinctively against misappropriative activities that appear unfair, even if they do not articulate their views in terms of creation disincentives or other market-based arguments. It is not surprising, therefore, that some courts have tried to circumvent Feist by developing new theories of copyright originality. One theory might be denominated "sweat of the brain," in that it finds a work to be copyright protected when creative intellectual decisionmaking goes into the process of creating the product, even though none of the creativity is evident in the final product itself. Another theory looks for creativity in the organizational scheme or principle underlying the work. Both these theories ultimately conflict with the tenet that copyright protection, which arises automatically upon creation of the work and continues for roughly 75 years, does not extend to facts, theories, systems, or discoveries. 13

The Second Circuit has recently attempted to steer a safer course by divorcing the finding of originality from the scope of protection. The result, however, not only resurrects the "sweat of the brow" theory under another name, flatly contradicting the dictates of Feist, but it also fails, at least without further jerryrigging, to resolve the tension between the antisappropriation goal and the inappropriateness of protecting functional works under copyright. These three post-Feist approaches to copyright as an antisappropriation statute are analyzed in more detail in the following sections of this article.

II. "SWEAT OF THE BRAIN" THEORY

An example of the "sweat of the brain" theory applied to maps is Mason v. Montgomery Data, Inc., 14 which involved real estate tract maps showing location, tract size and shape, deeds, abstract numbers, acreage, and tract ownership, along with other topographical features. Expert testimony proved that maps created by independent mapmakers would show differences in many features, resulting from "each mapmaker's selection of sources, interpretation of those sources, discretion in reconciling inconsistencies . . . and skill and judgment in depicting the information," and this evinced the creativity necessary for copyright protection. 15 Other cases similarly have

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13. "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." 17 U.S.C. § 102(b).
14. 967 F.2d 135 (5th Cir. 1992).
15. Id. at 139, 141. After deciding that neither the merger nor the originality doctrines would deny the plaintiff a copyright in his maps, the Fifth Circuit moved immediately to the question of statutory damages, without discussing the issue of infringement (which remained a matter for the lower court to determine). In fact, the nature of the infringement in this case is
relied on a finding of intellectual creative activity in the process of creating the work to conclude that the work was protected, even where there was no evidence of creativity in the final product except in the accuracy of its avowedly factual content. 16

Putting aside for the moment the possibility of creative expressivity in the mapmaker's choice of landmarks or other data actually shown on the resulting map, the end product in a case like Mason evidences none of the intellectually creative judgment of the mapmaker except when compared with similar products of other mapmakers. Moreover, accuracy in the factual information presented is the goal of all such mapmakers (not to mention a desideratum of their users). Nobody buys these maps for the very slight variations in the features portrayed (such as boundary locations) that represent the mapmaker's personality or judgment, except to the extent that a given mapmaker has a reputation for greater accuracy. 17 And a dispute about which map is more nearly correct with respect to a given factual

far from clear. According to the opinion, defendant and each of defendant's customers actually bought copies of plaintiff's maps. These maps were then cut up and pasted together in such a way that, together with plastic overlays supplied by defendant, users could readily access a computer databank containing information about properties in the county in question. Consequently, there was no copying of plaintiff's maps. The only conceivable infringement would be the creation of a derivative work either through the cutting and pasting operation or the use of the plastic overlay containing additional information, or both, and then only if these value-adding activities that do not deprive the plaintiff of sales of his maps are not considered a fair use. Cf. Mirage Editions, Inc. v. Albuquerque A.R.T. Co., 856 F.2d 1341 (9th Cir. 1988). Maps often would be less useful if such activities were to be construed as copyright infringement.

16. Marshall & Swift v. BS&A Software, 871 F. Supp. 952, 960 (W.D. Mich. 1994) (cost estimates mandated for use by state tax assessors were produced through a creative process of judgment and selection and are therefore copyright protected); Epic Metals Corp. v. Condec, Inc., 867 F. Supp. 1009 (M.D. Fla. 1994) (data derived from independent testing may be copyright protected); NADA Servs. Corp. v. CCC Info. Serv., Inc., 1991 U.S. Dist. Lexis 18874 (E.D. Ill. 1991) (numbers representing the assessed value of used motor vehicles may be protected if they result from a creative process of statistical analysis and judgment). A pre-Feist case rejecting the sweat of the brow theory of originality but finding copyright protection also falls into this category. Rockford Map Pub., Inc. v. Directory Serv. Co., 768 F.2d 145, 149 (7th Cir. 1985) (involving maps similar to those of Mason, the copyright covering the act of "translation from dusty books of legal jargon to a picture"). See also Rand McNally & Co. v. Fleet Mgt. Sys., Inc., 634 F. Supp. 604 (E.D. Ill. 1986) (relying on Rockford Map to base copyright protection solely on the arrangement of map data into tables and segmented maps, rather than on labor input in creating them, but finding infringement by inputting the resulting data into a computer, which could not involve a taking of the arrangement). Another case many thought Feist had killed may be resurrected under this theory. Wainwright Securities v. Wall Street Transcript Corp., 558 F.2d 91 (2d Cir. 1977) (specific predictions of earnings and other prospects contained in detailed analytical reports on companies held protected).

17. Moreover, copyright based on this notion could, at least in principle, protect the inaccurate maps but not the map of the best mapmaker who finally "gets it right."
question can, at least in principle, be decided with relative objectivity. If such information is deemed "non-factual" because of the intellectual judgment involved in determining it, little information will ever be denied copyright protection on the ground that it is unprotected fact, and much factual discourse will run close to the borderline of copyright infringement.

The approach to originality in maps taken by Mason also stands in stark contrast to pre- and post-Feist cases (and even Feist itself) that require expressive creativity in the end product independent of the manner or methodology by which the product was created. The clearest example is the denial of copyright protection to the products or conclusions of historical or scientific research.\textsuperscript{18} Surely these products or conclusions require the exercise of at least as much intellectual creativity in selecting sources, designing experiments, reconciling discrepancies, or interpreting results as the mapmaker applied in Mason. Even the telephone white pages at issue in Feist, at least if they were to be created from scratch and not, as in the actual case, from information already stored in a computer, would involve some minimal intellectual judgment concerning such questions as how the information should be collected, how to reconcile discrepancies, and how to insure completeness. Therefore, as a practical matter, widespread adoption of the "sweat of the brain" theory would render Feist meaningless.

One might attempt to reconcile Mason with Feist by distinguishing between "discovered facts," expressly ruled unprotected by Feist, and "created facts"—purportedly factual information generated by the creative intellectual processes of the person claiming authorship in them.\textsuperscript{19} It is true that Feist makes several references to facts as independently existing and

\textsuperscript{18} E.g., Hochling v. Universal City Studios, Inc., 618 F.2d 972 (2d Cir. 1980), cert. denied, 449 U.S. 841 (theory concerning the destruction of the dirigible Hindenberg unprotected); Nash v. CBS, 899 F.2d 1537 (7th Cir. 1990) (research conclusion that John Dillinger did not die in the manner commonly believed not protected); Gates Rubber Co. v. Bando Chemical Indus., Ltd., 9 F.3d 823, 843 (10th Cir. 1993) (constants used in mathematical equations determined through extensive experimentation not copyright protected); Project Devel. Group, Inc. v. O.H. Materials Corp., 766 F. Supp. 1348, 1354 (W.D. Pa. 1991) (estimates in bid proposal of scope of work, price, and quantities are all factual information, so copyright protection must be based on its selection or arrangement).

\textsuperscript{19} See generally Wendy J. Gordon, Reality as Artifact: From Feist to Fair Use, 55 LAW & CONTEMP. PROBS. 93, 93-96, 105 (1992) (pointing out the error in treating all facts as merely "discovered" rather than "created," but arguing that freedom to use facts should not depend on their "uncreated" status); Pamela Samuelson, The Originality Standard for Literary Works Under U.S. Copyright Law, 42 AM. J. COMP. L. 393, 399-400 (1994) (discussing the difficulties of the "discovery" rationale for denying copyright protection to facts).
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therefore capable only of "discovery" rather than creation by humans.\(^{20}\) Nevertheless, facts contained in historical and biographical works are as much the product of the author’s creative interpretation\(^{21}\) as the boundary lines of maps or the values of used cars, but *Feist* cites with approval cases expressly denying copyright protection in these contexts.\(^{22}\) Moreover, the legal boundary between two tracts of land is very much a preexisting "fact," even if two different surveyors would place it slightly differently as a result of their different data-gathering or data-interpretation techniques. It is surely closer to a preexisting fact than information created out of whole cloth but presented as factual truth, which the courts uniformly treat as unprotected fact under copyright.\(^{23}\)

Another objection to *Mason* is that its approach to copyright originality seems more naturally classified as "idea" rather than "expression." Imagine, for example, that the mapmaker in *Mason* publicly announced the sources on which he relied as well as his detailed methodology for reconciling discrepancies. Few would argue that another mapmaker would infringe who, on the basis of that announcement, chose to consider those sources and adopt the announced methodology in the process of otherwise independently making a similar map. Noninfringement, however, means that the decision to use those sources and that methodology is idea rather than expression, however creative the decision may be.\(^{24}\)

Reliance on the "sweat of the brain" theory—finding the creativity necessary for copyright in the intellectual process by which a work is

\(^{20}\) E.g., 499 U.S. at 347 ("The first person to find and report a particular fact has not created the fact; he or she has merely discovered its existence."); 361 ("Rural may have been the first to discover and report . . . the telephone numbers . . . but this data does not 'owe its origin' to Rural.").


\(^{24}\) This result comports with our traditional understanding of idea-expression and the distinction between patent and copyright. To protect choices of source material or methodologies of interpretation would severely constrain subsequent researchers seeking to confirm or improve upon the current state of knowledge. This is the basic message of Baker v. Selden, 101 U.S. 99 (1880).
produced—thus requires both distinguishing *Feist* in a meaningful way that 
do not decimate a Supreme Court precedent as well as a theory of the 
scope of protection that is severed from the creativity (an unprotected 
intellectual process) that brings the work under copyright protection. 
Formally, *Feist* can be distinguished for pictorial maps. Electronic databases, 
however, represent another problem.25

III. CREATIVITY IN THE ORGANIZATIONAL 
SCHEME OR PRINCIPLE

Copyright protection requires originality, and *Feist* says that originality 
requires some modicum of “creativity.” *Mason* and the “sweat of the brain” 
cases find the necessary creativity in the intellectual process by which a work 
is produced, although the final product may be no more than a simple 
boundary line or even a single number. Other cases attempt to get around the 
*Feist* requirement by looking for creativity in the organizational scheme or 
principle by which facts are selected or arranged in the resulting work.26 
This approach runs a serious risk of protecting creative functional ideas or 
standardization schemes.27 Taken to its extreme, it would allow entire classes

25. See infra text accompanying notes 57-66. 
26. E.g., Warren Pubs., Inc. v. Microdos Data Corp., 52 F.3d 950, 952 (11th Cir. 1995) 
(creative “system” for selecting lead communities for arranging cable TV systems is copyright 
protected); Key Pubs., Inc. v. Chinatown Today Pub. Ent., 945 F.2d 509, 516 (2d Cir. 1991) 
(copyright protects the “organizing principle” by which businesses are selected for yellow page 
classification); Kregos v. Associated Press, 937 F.2d 700 (2d Cir. 1991) (choice of nine 
categories of baseball statistics for use in predicting game results is protected if original); 
Montgomery County Ass’n of Realtors, Inc. v. Realty Photo Master Corp., 878 F. Supp. 804, 
810 (D. Md. 1995) (unique and elaborate “system” of abbreviations used to organize a database 
helps supply the necessary creativity for copyright protection); Practice Mgt. Info. Corp. v. 
American Medical Ass’n, 877 F. Supp. 1386, 1390 (C.D. Cal. 1994) (coding “system” 
mandated for government use sufficiently original to justify copyright protection); Nester’s Map 
addresses along major streets and selection aimed at the important and most helpful cross streets 
in a New York taxi guide held to be creative and protected and infringed by the taking of a 
1398, 1405 (N.D. Cal. 1995) (summary judgment inappropriate on certain protectible elements 
of a computer game “scoring system”).

27. Karjala, supra note 2, at 890 & n.23; Ginsburg, supra note 5, at 344-45. Yellow 
page classification schemes, for example, are methods of presenting information in which both 
“user friendliness” and some degree of standardization are desirable. Protection of the yellow 
page classification scheme for Miami would mean, at least in principle, that no one could adapt 
that scheme to create yellow pages for Chicago. This would force every creator of yellow pages 
who start from scratch in devising unpatented classification schemes and inhibit the incremental 
development of user friendliness. Moviegoers would have to look under “Cinemas,” “Film 
Theaters,” “Theaters,” “Movies,” “Movie Houses,” “Cinematographic Performances,” and so 
on before they could find the listings in a strange city, all names created for the sake of being
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of maps, such as contour maps, to be monopolized for the full period of copyright by the first mapmaker who devises a new and useful representational scheme. Section 102(b) of the Copyright Act, as well as the venerable case of Baker v. Selden,\textsuperscript{28} should prohibit copyright protection for organizational schemes or principles.

Professor Gorman has suggested that an original arrangement can lead to copyright protection not for the abstract principle by which the materials are organized, but for the particular organization generated by a specific application of the principle.\textsuperscript{29} It is not clear, however, where this approach to copyright originality would leave a second comer who independently assembles the same facts and arranges them according to the same principle. If this activity infringes copyright, it must be that the abstract principle is protected, because the individual facts are not copied. On the other hand, to deny infringement on these facts raises the question of what the copyright protects. The second work shows precisely the same relationship between the creative organizing scheme and the assembled facts. If application of the creative principle to independently gathered facts does not infringe, the copyright protection for the first compiler does not cover the originality on which the first copyright is based, namely, a creative abstract organizing scheme applied to specific facts. This conclusion is contrary to Feist and to traditional copyright jurisprudence, which say that the copyright protects precisely the originality on which the copyright is based.\textsuperscript{30}

In any event, even Professor Gorman's approach to copyright originality will leave many maps without protection. Whether or not the preparation is costly or time-consuming, the value of many maps inheres in the factual information they contain and not in clever ways of presenting that informa-

\textsuperscript{28} 101 U.S. 99 (1880) (accounting system and the forms necessary to practice the system are not copyright protected).

\textsuperscript{29} Robert A. Gorman, The Feist Case: Reflections on a Pathbreaking Copyright Decision, 18 Rutgers Computer & Tech. L.J. 731, 755-56 n.60 (1992) (“Of course, the copyright claimant seeks protection not for the sequencing principle in the abstract but rather for the particular sequence of data or materials that is generated by the application of that principle.”).

\textsuperscript{30} 499 U.S. at 348 (“[C]opyright protection may extend only to those components of a work that are original to the author”), 360 (“[A] compilation is copyrightable only to the extent that it features an original selection, coordination, or arrangement”).

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tion. If legal protection is a necessary incentive to the creation of such maps, this theory of copyright originality will not supply it.

Similarly, basing copyright protection on the mapmaker’s selection of landmarks or other data, all of which would be permitted by Feist (if creative), does not address the problem at its most fundamental level. The scope of copyright protection has always been tied to the originality (creativity) on which the copyright is based. If we retain this relationship, relying on creative selection will leave many maps without meaningful protection. First, the choice of data to include may represent an organizational principle excluded from protection under section 102(b). Second, the landmarks chosen often will be the obvious or natural landmarks for that particular kind of map, in which case copyright protection is denied for want of creativity. Third, even if a particular selection of landmarks or other features can be deemed subjective, nonfunctional, and unnecessary for the map’s intended use, a copier can avoid infringement simply by taking all of the other information from the map without taking the subjectively chosen and unnecessary features.

IV. CREATIVITY IN IDEA COUPLED WITH LIMITED SCOPE OF PROTECTION

Thoughtful pre-Feist commentators argued that courts should find the necessary originality for copyright protection in the social contribution of gathering, verifying, and presenting useful information. The courts could then effect the social policy balancing between incentives and free use through scope-of-protection and fair use analysis, looking at such factors as the public interest in increased access, the extent of the copying, and the degree of competitive impact. Professor Denicola’s approach of finding originality in the collection as a whole would permit extraction of individual facts and would find infringement only when the copying results in a substantially similar collection.

But Feist explicitly rejects “industrious collection” as a basis for copyright originality while maintaining the traditional relationship between originality and the scope of protection: “Originality remains the sine qua non of copyright; accordingly, copyright protection may extend only to those

31. Ginsburg, supra note 4, at 1876. Digital maps contain only such factual information, plus a (copyright-protected) computer program that allows the user to access the data. One need not copy the program, however, to copy the data.
32. Robert A. Gorman, Copyright Protection for the Collection and Representation of Facts, 76 Harv. L. Rev. 1569, 1603 (1963); Ginsburg, supra note 4, at 1897 n.125.
33. Gorman, supra note 32, at 1583-89; Ginsburg, supra note 4, at 1905.
34. Denicola, supra note 10, at 531.
35. 499 U.S. at 352.
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components of a work that are original to the author."36 This creates the unpalatable choice discussed in the previous two sections between failing to protect the economically valuable aspects of many low authorship works, such as digital spatial data, or recognizing copyright originality in creative methodologies for collecting or presenting the information, contrary to section 102(b) and Baker v. Selden. To adopt Professor Denicola's approach would place a lower court in direct defiance of Feist, while expressly to divorce the scope of protection from originality would be contrary to longstanding copyright tradition strongly restated by Feist.

Nevertheless, courts continue to try. A recent Second Circuit decision follows the many post-Feist courts that find "creativity" in the production of numbers and other data where economic value would otherwise be vulnerable to incentive-eroding piracy. The court, however, seems to recognize that complete protection of all of the fruits of that creativity might not be in the public interest. As a result, the court struggles hard for a principle that would limit the scope of protection while inhibiting misappropriative copying.

In CCC Information Services, Inc. v. Maclean Hunter Market Reports, Inc.,37 Judge Leval directed the entry of summary judgment in favor of the defendant copyright claimant, which published a used car buying guide known as the "Red Book."38 As to copyright originality, the court concludes that the estimated vehicle values in the Red Book were not "discovered" preexisting facts, such as the telephone numbers in Feist, but rather represented predictions of future prices in various geographical areas, based on a multitude of information sources as well as the exercise of professional judgment and expertise. In this sense, the valuations were the "original creations" of Maclean.39 The court also finds sufficient originality for copyright protection in the selection and arrangement of the valuations, based on Maclean's division of the national used car market into various regions, choices concerning optional features, using 5,000-mile breakpoints for mileage, the use of the concept of the "average" vehicle in each category, and the selection of the number of years for which models would be included. Judge Leval concludes that designing the arrangement of the data to respond logically to the needs of the market does not negate originality.40

36. 499 U.S. at 348.
37. 44 F.3d 61 (2d Cir. 1994).
38. The original action was for a declaratory judgment of noninfringement by CCC, so the normal role in copyright cases of plaintiff as claimant was reversed.
39. 44 F.3d 66-67. See supra text accompanying notes 19-23 for a discussion of the deficiencies of distinguishing Feist on the basis of "discovered" rather than "created" facts.
40. Id. at 67-68. Such design should, however, be relevant to the scope of protection, because copyright should not protect those aspects of works dictated by external factors. Gates Rubber Co. v. Bando Chemical Indus., Ltd., 9 F.3d 823, 838 (10th Cir. 1993). Therefore, if originality is predicated on a creative arrangement that responds to the needs of the market, the
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To this point, Judge Leval appears to be using both of the theories discussed in the previous two sections, finding copyright originality in both a creative methodology for producing the valuations and in the organizing scheme for presenting them. Had he stopped there, the case would simply be another example of a court's straining to avoid an apparently unfair misappropriation of costly production efforts. However, Judge Leval goes on to consider with some care the idea-expression distinction and the merger doctrine. The opinion recognizes the importance of free public access to ideas and concedes that the valuations given in the Red Book are simply the expression of the authors' idea for the values of the vehicles covered. The opinion concludes that an incentive to authors must be balanced against free access and that to treat the valuations as unprotected ideas would negate the application of copyright protection for compilations. 41

In drawing the balance, Judge Leval distinguishes between two kinds of ideas: ideas that "undertake to advance the understanding of phenomena or the solution of problems" 42 and "soft ideas infused with taste and opinion." 43 As to the first category, protecting expression necessary to expression of the idea would remove building blocks of free discussion. As to the second category, however, to deny application of the merger doctrine does not risk serious injury to the policy favoring free use of ideas. He concludes that the Red Book valuations are in this second category, as they are infused with opinion and describe no method or process. 44

Section 102(b) provides, of course, that copyright protection does not extend to any idea and would not seem to permit the distinction between unprotected "building block" ideas and protected "soft" ideas. Moreover, this distinction between two different classes of ideas would seem to protect scope of protection cannot be coextensive with the originality on which copyright protection is based. Indeed, there may be no overlap whatever between the aspects of the work that are protected and the aspects that give rise to copyright protection. This problem, of course, is not new. It was inherent in the old "sweat of the brow" approach to copyright originality.

41. Id. at 68-70. This last conclusion is simply wrong. Social registers and restaurant guides, for example, reflect traditional (and nonfunctional) authorship personality in their selections for inclusion, which permits the author to prevent a taking of substantially all of the chosen entries (even if the second author gathers the individual facts independently). Protection is available for many compilations, but the scope is "thin." The Red Book, for example, would still be protected as a compilation even if the individual valuations were treated as unprotected idea. Copying their precise arrangement, if original and not largely dictated by logic or external forces, would infringe. Whether that level of protection for this type of compilation suffices as an economic matter to ensure its production, of course, is the question that Feist forces.

42. Id. at 71.
43. Id. at 72.
44. Id. at 72-73. Professor Gorman, too, pointed to the different social utility of historical information, as opposed to horse racing results, as justifying a different approach to infringement in the two cases. Gorman, supra note 32, at 1583-84.
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not only the compilation as a whole but each of the valuations individually, thereby making anyone who writes down Red Book valuations for a particular class and sends the list to a friend or a potential infringer. Judge Leval seems to anticipate this objection, however, by noting that CCC's copying was "of virtually the entire compendium." 45 This implies that a lesser taking might not infringe.

This latter thought challenges the traditional relationship between copyright originality and the scope of protection. By hypothesis, the exercise of professional judgment and expertise has lead to the creation of "soft" (and therefore protected) ideas, namely, the individual valuation estimates. This is the originality on which copyright protection is based. But each valuation estimate requires roughly the same exercise of judgment. If taking some limited number of the valuations does not infringe, that much of the author's originality would be unprotected. The result is copyright protection for the work as a whole, based on creativity in the process of producing the valuation estimates, but with a limited scope of protection (perhaps even limited to wholesale takings).

Several objections spring to mind. Judge Leval cites with apparent approval cases relying on one or the other of the theories discussed in the earlier sections. By finding copyright originality in the selection or arrangement of data that responds logically to market demands, he invites 75 years of copyright protection for the kinds of classification schemes that normally reach optimal form through incremental improvement—an approach that can stop improvement in its tracks in view of the vagueness of copyright's "substantial similarity" standard for infringement. 46 Suppose, for example, that a particular geographical division or the use of 5,000-mile breakdowns does respond logically to market needs. We want competitors to take those choices that are working well and tinker with them to make the collection more useful, as long as they do their own work in estimating the values of the vehicles so that they do not undercut incentives. We are no longer concerned with artistic creativity but rather with the usefulness of informational tools. Requiring competitors who do their own work in estimating values to use substantially different geographical or mileage breakdowns just to be different can reduce competition once one of their number has hit upon an optimal or near optimal combination. People rarely read the same novel

45. The opinion expands on this thought in a footnote pointing out that the Second Circuit applies the merger doctrine not at the copyrightability stage but rather in the context of the alleged infringement: "[I]t is of consequence that we are confronted with wholesale copying of a compilation rather than some more limited copying from a compilation." Id. at 72 n.26.

46. Incremental improvement of functional works is precisely the basis for the traditional protection of function under patent law rather than copyright. Dennis S. Karjala, Copyright Protection of Computer Software, Reverse Engineering, and Professor Miller, 19 U. DAYTON L. REV. 975, 976-83 (1994).
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or see the same movie over and over; they want variety in these works, which is why the long period of copyright protection does not inhibit competition in the market for books or films. Useful classification schemes, however, are repeatedly employed, like any other tool. 47 That is the reason section 102(b) denies copyright protection to procedures, systems, and methods of operation, and the reason Baker v. Selden 48 emphasizes reserving patent law for functional works.

Moreover, Judge Leval’s classification of ideas for merger purposes purports to be derived from Kregos v. Associated Press, 49 which did not involve wholesale taking of data, or indeed any data, from a compilation. Rather, Kregos involved a method for presenting data, all of which was independently calculated by the defendant anew each day. This reliance on Kregos further reduces the chance that later courts will interpret CCC Information Services as an antmisappropriation case and, indeed, supports the interpretation that the functional classification scheme is copyright protected. 50

Nonetheless, by applying the merger doctrine in the infringement rather than the copyrightability analysis, 51 the opinion in CCC Information Services does at least hint at the direction in which the law should move. Given Feist and the Second Circuit’s precedents, 52 it would hardly have been possible for Judge Leval to have been more explicit about what he was doing. If later courts do manage to interpret the correct message of this case—if they begin to reapply the “sweat of the brow” doctrine with a more careful analysis of the scope of protection in particular situations—they will repair much of the damage that Feist created when it removed protection from “low authorship” works that are vulnerable to piracy. And, they will reduce the dangers of competition-choking copyright protection of representational ideas and systems under the other theories that courts have adopted to circumvent Feist. Eventually, however, we need either a forthright admission that copyright law is being used to achieve socially desirable antmisappropriation ends

47. Such schemes should no more be copyright protected than the methods of operation involved in computer user interface menu command hierarchies. Lotus Dev. Corp. v. Borland Int’l, Inc., 49 F.3d 807 (1st Cir. 1995).
49. 937 F.2d 700 (2d Cir. 1991).
50. Judge Leval also relies on the Second Circuit’s decision in Key Pubs., Inc. v. Chinatown Today Pub. Ent., 945 F.2d 509, 516 (2d Cir. 1991), which in dictum said that the “organizing principle” underlying a yellow page classification scheme would be protected, without apparent awareness of section 102(b)’s denial of copyright protection to any “principle.” See Samuelson, supra note 19, at 404.
51. See supra note 45.
regardless of "artistry" or "authorship," or a new statutory scheme expressly focused on the misappropriation problem.\footnote{Professor Reichman has proposed a bold new intellectual property paradigm based on "legal hybrids," the protection of which falls through the crack between patent and copyright. J. H. Reichman, Legal Hybrids Between the Patent and Copyright Paradigms, 94 Colum. L. Rev. 2432 (1994). It is not clear, however, how works of traditional copyright subject matter that under \textit{Feist} fall outside the copyright umbrella, such as complete electronic databases or (perhaps) "barebones" plat maps, would fare. These and other works, like digitally stored versions of public domain texts, are vulnerable to piracy; however, they are not "legal hybrids" and they do not carry any "knowhow" on their face, which seems to be Professor Reichman's test for inclusion in the new scheme. In response to Professor Reichman's proposal, I have argued that we should simply focus on the misappropriation problem directly. Dennis S. Karjala, Misappropriation as a Third Intellectual Property Paradigm, 94 Colum. L. Rev. 2594 (1994).}

\section*{V. THE PROTECTION OF MAPS UNDER COPYRIGHT}

\textit{Feist} poses a serious problem for the protection of maps. Attempts to circumvent \textit{Feist} by finding creativity in the process of producing the work, in its organizational scheme, or in its selection of landmarks or other features either do not succeed in supplying protection to those elements of the map that give it economic value or contradict long-accepted copyright principles. If Judge Leval's apparent attempt in \textit{CCC Information Services} to revive the "sweat of the brow" theory of protection survives, an additional theory for the scope of copyright protection in maps must give sufficient incentive to their production while permitting later mapmakers to use and improve upon the useful (but unpatented) representational tools and classification schemes developed by their forebears. In fact, this is the real problem for pictorial maps today, because as a strict matter of legal precedent, \textit{Feist} does not apply to them.\footnote{\textit{See infra} text accompanying notes 57-58.}

For more general geographic information systems in the form of electronically stored collections of data that never existed in pictorial form, we will find adequate protection only through one of three approaches. The first is a carefully tailored elaboration of Judge Leval's recognition of copyright protection for the work as a whole based on whatever appears to be creative in the work, whether that element represents traditionally unprotected "fact" or "idea," or traditionally protected "expression." The scope of protection must then be adjusted by a sensitive balancing of production incentives against free use and improvement (especially of functional aspects). This approach suffers from the problem that it must be developed judicially, directly in the face of \textit{Feist}. The second approach is a statutory amendment of the definition of "compilation" to accommodate a
broader range of "low authorship" works. The third approach is a sui generis statute, aimed either at electronic databases in particular or at works vulnerable to misappropriation in general. In theory, one of these last two choices is preferable, but getting Congress to act, and to act sensibly, has its own difficulties.

I outline briefly in the next subsections the current jurisprudential problems we face in the protection of pictorial maps and of more general electronically stored geographic information systems.

A. Pictorial Maps

As has been indicated above, developing an appropriate theory of map protection is very difficult if Feist is applicable. This may be the single most important lesson to be gleaned from the post-Feist cases that have struggled to protect economically valuable products that appear vulnerable to inexpensive appropriation. One possibility, at least for pictorial maps, is simply to confine Feist to its factual context. While the language of Feist is broad, the case dealt with a compilation of facts, and the Feist decision could easily have rested on the Court's analysis of the statutory definition of "compilation" without resort to global constitutional analysis. Pictorial maps are classified as "pictorial, graphic, and sculptural works" under the statute. They are therefore not strictly covered by Feist's factual holding. Although one does not lightly ignore language in a Supreme Court opinion, nothing in the Feist decision indicates that the Court was aware of the sweeping and negative effect its language would have on the protection of pictorial maps—works that have been covered by our copyright statutes from the beginning.

Even assuming that Feist does not apply to pictorial maps, however, we are left with the problems of determining which maps are protected and defining the scope of their protection. The first task is relatively easy. The

55. This could be accomplished, as suggested in Feist, by redefining "compilation" in section 101 as simply "a work formed by the collection and assembling of preexisting materials or of data," dropping the requirement that originality be found in the selection, coordination, or arrangement of the compiled materials or data.

56. See supra note 53.

57. See the definition of "compilation" supra note 11. None of the Court's statutory analysis in parts IIB, IIC, and III of the opinion depends on the constitutional analysis in part IIA.

58. See Karjala, supra note 2, at 894-99. At least one post-Feist commentator has insisted upon the pictorial or graphic form of maps to distinguish them from factual compilations, and therefore from Feist. David B. Wolf, Is There Any Copyright Protection for Maps After Feist?, 39 J. COPR. SOC'Y 224, 239-42 (1992). This distinction, of course, only accentuates the limitations on protection afforded to more general geographic information systems discussed in the following subsection.
"creativity" requirement that Feist added to the copyright notion of originality should be dropped, and a map should be copyright protected when it is the product of its maker's intellectual effort, that is, when it is not copied from another map.\textsuperscript{59} This would cover original survey maps as well as original compilations of preexisting maps.\textsuperscript{60}

Defining the scope of pictorial map protection is much more difficult.\textsuperscript{61} Having divorced the "originality" problem from the scope-of-protection problem, we must articulate new standards for determining those uses of the factual information contained in maps that should remain under the control of the author. At a minimum, maps must be protected against mechanical or electronic copying if the copyright is to have any meaning. At the other extreme, it should be clear that a competitor's independent gathering of the factual information cannot infringe, even if the idea for making the competing map comes from having seen the first one and the end result is indistinguishable. Thus, the factual information in the protected map should not be protected as such. It should be protected only against certain methods of appropriation, such as photocopying. To this extent, copyright would become an antisimulation statute rather than a general statute for the protection of artistic creativity.

Precisely what methods of taking or using factual information contained in a protected pictorial map should be deemed infringement is a policy judgment that requires delicate balancing of the need for incentives to produce maps against the social loss in requiring constant reinvention of every wheel.\textsuperscript{62} Certainly whether the information taken is used to make a noncompeting product\textsuperscript{63} or is put to productive use in improving an existing product will be relevant,\textsuperscript{64} as will the amount taken. Probably the key question is whether the method of taking allows the copier to undercut the price of the original product before the original creator has a fair chance to recoup investment costs.\textsuperscript{65}

\textsuperscript{59} Even Feist admits that the requirement for creativity is "extremely low." 499 U.S. at 345. It is difficult to see why we do not drop such a minimal creativity requirement altogether, especially if refusing to do so creates a disincentive to the production of desirable works. Karjala, supra note 2, at 889.

\textsuperscript{60} E.g., United States v. Hamilton, 583 F.2d 448 (9th Cir. 1978).

\textsuperscript{61} See Karjala, supra note 2, at 909-15.

\textsuperscript{62} Ginsburg, supra note 5, at 346.

\textsuperscript{63} Ginsburg, supra note 4, at 1905.

\textsuperscript{64} Leo J. Raskind, The Continuing Process of Refining and Adapting Copyright Principles, \textit{14 COLUM.-VLA J. L. & ARTS} 125, 154 (1990) (second map compiler infringes if her work does not enhance, facilitate, or improve accessibility of the underlying information).

\textsuperscript{65} See Karjala, supra note 2; Karjala, supra note 53. Professor Gorman agrees that a thin copyright is appropriate for maps by providing protection at least against "grosser forms" of copying and encouraging the adding of value either through verification or revision or through improvements in the presentation. Gorman, supra note 5, at 570.
B. Geographic Information Systems as Collections of Data

If a map exists in pictorial form and is deemed copyright protected following the analysis in the previous subsection, it would not lose its protection when the information it portrays is digitized and stored in an electronic database. However, many geographic information systems may simply be collections of data that have never existed as a coherent whole in pictorial form. It is difficult to find a copyright classification for such collections outside of "compilation," and that implies all of the Feist limitations on copyright protection. Data stored in an electronic database have no discernible "arrangement" that can serve as the basis for copyright originality, so protection arises at best from a creative "selection" of the data stored. When, therefore, data are collected according to a standard classification scheme, or when the data are in some sense "complete" so that there can be no creative selection, copyright protection, under Feist, simply will not attach. Anyone having access to the data may legally download all of it without liability for copyright infringement. Moreover, even if some creative selection can be found as a basis for copyright protection, an even more selective taking would not infringe. Possibly, even an entire taking would not infringe if the copier adds additional data to the collection, because the end product would no longer reflect the "creative" selection of the original.

All these situations create disincentives to the costly production of valuable data and its delivery in useful electronic form. Moreover, when someone does assemble the data, in many cases access is likely to be restricted to persons whose use can be controlled by contract. One way to overcome these problems may be to ignore Feist by reviving the "sweat of the brow" theory in the manner suggested by CCC Information Services. Copyright protection would be based on perceived "creativity" in the methodology of gathering or presenting the information contained, but the

66. A "copy" is any fixation of the work from which the work may be perceived or reproduced, either directly or through mechanical assistance. 17 U.S.C.A. § 101 (definition of "copies"). Consequently, a digital fixation is simply a copy of the original (protected) pictorial map. Electronic storage may affect the scope of protection, however, to the extent that ease of theft is explicitly or implicitly brought into the infringement analysis. A referee for this article pointed out that a common method for development of geographic information system databases is to digitize certain features from pictorial maps and include them in new databases containing other features and information. Obviously, digitizing an entire map for this purpose would seem to be at least a prima facie infringement, as would the taking of any substantial part. In both cases, however, the analysis of the previous subsection would see the productive use as a factor potentially limiting protection. If, in addition, the new, value-added product does not compete with the map whose features are copied, there may be a good argument that the activity does not infringe.
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scope of protection would be determined through analysis of economic incentives. In particular, infringement could be limited to wholesale appropriations, or even just competitive wholesale appropriations. The only "legitimate" remedy, however, in view of Feist, is either a statutory amendment of the "compilation" definition or a sui generis database-protection statute.67

CONCLUSION

"Confusion" is the best description of the state of post-Feist copyright protection of maps, especially digitized geographic information systems. The lower courts are struggling to avoid the strictures of Feist, because they see that costly and economically valuable products are vulnerable to misappropriation. These courts cannot directly contradict Feist, and they do not wish to contradict other long-standing principles of copyright, such as the non-protection of ideas, systems, procedures, and concepts under section 102(b) or the principle that copyright protection is coextensive with the expressive originality on which the copyright is based. Something, however, must give way. Courts cannot simultaneously follow Feist, remain faithful to these long-standing copyright principles, and protect all works they wish to protect. Implicitly, therefore, the courts seem to be reviving the "sweat of the brow" theory of copyright protection supposedly rejected by Feist. When the dust clears, the principle most likely to have fallen by the wayside is the one linking copyright protection to the original features of the work on which the copyright is based, and we are likely to see a separation of copyright "originality" in a work from the scope of its copyright protection. In essence, this is the "sweat of the brow" theory under another name, but by the time the Supreme Court takes another look at the problem, its members may better understand the damage that Feist has wrought and be willing to rethink the issue in terms that better balance the tension between production incentives for these works and the social value in freer use by second comers.

67. See supra notes 53 & 55-56 and accompanying text.

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