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HIGH TECHNOLOGY LAW JOURNAL
FALL 1987 VOLUME 2 NUMBER 2

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ARTICLES

SECURED FINANCING AND INFORMATION PROPERTY RIGHTS

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INTRODUCTION

We advocate a simple proposition. Financing law and intellectual property law should jointly foster, rather than impede, investment in information and technological assets. To do this, there must be a coherent and stable body of law applicable to information asset financing. Current law falls far short of this requirement. This Article begins to define how and where coordination can be achieved in the laws governing intellectual property and finance. It also identifies current issues important to the structure of contemporary credit financing of information assets.

Society has entered an "information age." This phrase has different connotations for different aspects of how we do business and how we function socially. Foremost among these is the simple fact that information, how it is processed and how it is used, has increasing value and influence in our economy. Information is an asset at the forefront of current technological development and commercial investment. It will remain there for the foreseeable future.

Commercial and intellectual activity in technological areas is intense and cannot continue to be burdened by uncoordinated and uncertain law. Therefore, reconciling commercial finance law with intellectual property law is not an elective question. We have no choice. The integration of law and practice in these two fields will occur in one form or another. The issue today is when this integration will occur and according to what policy themes. We propose that the proper goals in information asset financing law are (1) to provide clearly articulated rules around which transactions can be planned, and (2) to establish a system that minimizes the costs and limits the risks in creating and maintaining interests in intellectual property assets.

Section one of this Article outlines the general interaction between intellectual property and commercial finance law. Both legal frameworks provide incentives that promote and facilitate their respective activities. The optimum system would coordinate incentives to enhance opportunities for development and use of information assets. As will be shown, our attainment of this goal is

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impaired by the lack of coordination of the applicable fields of law and by the variety of property interests, with associated substantive rules, that exist in intellectual property assets.

Section two discusses third party rights in light of the interaction between these two legal fields. The legal rules as they relate to third parties are uncertain both as to how a lender can establish its position in relation to third party investors and under what rules that position will be defined. The questions of whether or to what extent federal laws preempt state rules for perfecting a security interest or determining its priority have not been authoritatively resolved. Consequently, careful lenders must now comply with two parallel systems and structure their transactions so as to hold priority under both. But even with double compliance, existing federal priority concepts make the lender's position uncertain.

We propose a system of federal filing for security interests in those forms of intellectual property currently governed by substantive federal law. This will move us toward the goal of consistent and identifiable rules, while minimizing lender costs. We further propose that federal filing should be connected to state law priority rules. State laws can coordinate finance law for federal property under rules affecting the types of intellectual property governed purely by state law.

Section three examines the relationship between the lender and the "owner" of proprietary rights. Although the issues in this area are more diverse, many can be resolved contractually. The role of law in this area should be to build underlying presumptions and structural rules that generate acceptable outcomes if the parties do not clearly address the issues by contract. However, federal patent and trademark laws currently emphasize concepts no longer central to contemporary commercial finance law. These federal laws should be updated to reflect contemporary commercial finance practices.

We will finally discuss other lender-owner conflicts that may not permit a contractual solution. Currently, the value and existence of certain information assets can be destroyed if the debtor, or the party with which it holds a license agreement, files for bankruptcy. The treatment of intellectual property licenses in bankruptcy influences their value as stable assets against which financing can be provided. Further unresolved issues arise in the treatment of new developments or refinements of existing technology from an original intellectual property base. We propose a broadened conception of after-acquired property which incorporates newly developed intellectual property based on prior work into "proceeds" of the original information asset.

I. COMPETING SOURCES OF LAW AND THE DEVELOPMENT OF INFORMATION ASSETS

The development of information assets requires a confluence of creative work and adequate resources. Spontaneous development or sudden insight innovation rarely happens, yet the popular notion that it does often obscures the effort and resources involved in developing information assets. As a matter of

business policy we cannot afford to continue to let this fallacy diminish the importance of actively encouraging development of intellectual property.¹

The goals of an ideal legal system governing intellectual property should be to stimulate development of information assets and create an environment in which the confluence of creative effort and resources is planned for and implemented. A legal framework that encourages technological and information based investment must reward both the creative party and the one who supplies the resources to find, make, market, or otherwise exploit the information. These two parties must be able to understand and manipulate their relative legal positions and the position of third parties making claims or seeking access to the product.

In broad outline, intellectual property laws deal with rewarding the creative party for his or her creativity *per se*, while commercial finance law deals primarily with the rights of resource providers. Intellectual property law is fundamentally designed to reinforce incentives for artistic and scientific achievement. It balances the rights of the developer against the interests of others desiring to use the technology. This balance entails defining the exclusive rights of one party and the means for their enforcement against others. In contrast, credit finance laws distribute financial risks and provide a framework for conducting transactions that establish the secured party's rights of access to the debtor's property if the debtor fails to voluntarily pay its debts.

The coordination of these two bodies of law is vital at the product development stage where, without appropriate levels of financial investment and support, important advances may be retarded or lost. Access to financing is equally important for placing products in commerce and for post-development marketing.

A. Investment and Legal Incentives

Our legal system influences investment in information assets in various ways. It is used to manipulate the risks and rewards associated with the development of information-based property. Dissonance among applicable laws can cripple any effort to encourage investment. The goal of the legal system should be to encourage and coordinate the manipulated effects so to stimulate investment in intellectual property assets. However, because of frequent change and general uncertainty in the applicable areas of the law, coordination and encouragement are not always achieved. This section will discuss three areas of law which significantly affect investment in information assets: tax, intellectual property, and credit laws.

Tax laws influence investment in information assets by manipulating the financial benefits of investment in development and new products. This direct financial consequence impacts treatment of research and development costs, investment partnership rules, and investment tax credits.² Generally, rules

1. See P. DRUCKER, *INNOVATION AND ENTREPRENEURSHIP* (1985) (arguing that innovation can be approached as a systematic rather than purely fortuitous undertaking).

2. The investment tax credit was repealed in the 1986 amendments to the Internal Revenue Code, but treatment of research and development costs as well as intellectual property assets

granting favorable tax treatment are an incentive for technology or information development, while converse rules work as a disincentive to investment. As a matter of practice, however, tax rules shift frequently and have uncertain application to information technology.

Our legal system also influences investment by apportioning rewards in the form of exclusive rights to control the information or technology created. This is the main province of intellectual property laws *i.e.*, patent, copyright, trademark, and trade secrecy. These laws grant benefits based either on financial contributions³ or personal creative efforts. Unlike tax law, intellectual property law incentives are indirect. The investor or creator obtains value only by exploiting his exclusive rights to the work. This may involve marketing the product to third parties or retaining it to support other activities, such as future development.

A major theme in intellectual property law focuses on defining the rights of the developer of the property against third parties. These are "infringement" questions. As we write this article, infringement rules in copyright, patent, and trade secrecy law are being stretched and strained in an unprecedented manner by new information technologies.⁴ In simple fact, the changes induced by technology have altered the way in which we treat information, transforming it into a palpable asset whose control has both economic and political significance.⁵ The vital but unanswered question of our era is how the goal of encouraging creative work will effect the scope of private control over information assets.⁶ Questions of control over the asset have an obvious relationship to encouraging financial investment as well as creative effort. The breadth and certainty of control held by the debtor determines in part the value of the asset as collateral.

In addition to infringement questions, intellectual property law also decides who receives (or owns) the exclusive rights of the property where, as in the common case, several parties invest in the final product. In many situations, each party contributes its own "investment" in the form of creative effort. In other cases, however, one party claims ownership on the basis of financial or resource contributions, while another makes such a claim on the basis of

influence technology and other development. See R. WESTIN, MIDDLE INCOME TAX PLANNING AND SHELTERS §§ 2.70-.79, 4.98 (1987); R. NIMMER, THE LAW OF COMPUTER TECHNOLOGY ¶¶ 4.11-4.12 (1985).

3. See, *e.g.*, 17 U.S.C. § 201(b) (1982) (person who pays for work to be created rather than author receives copyright). An example of the financial contributor as owner arises when companies employ independent contractors to create protected works. See, *e.g.*, *Easter Seal Soc'y for Crippled Children v. Playboy Enter.*, 815 F.2d 323 (5th Cir. 1987), *appeal filed*, 108 S.Ct. 325 (1987).

4. See Nimmer & Krauthaus, *Copyright and Software Technology Infringement: Defining Third Party Development Rights*, 62 IND. L.J. 13 (1986); Davidson, *Protecting Computer Software: A Comprehensive Analysis*, 1983 ARIZ. ST. L.J. 611.

5. See J. POOLEY, PROTECTING PROPRIETARY BUSINESS INFORMATION AND TRADE SECRETS (1987); J. NAISBITT, MEGATRENDS (1982). See also J. WASEK, ELECTRONIC BUSINESS INFORMATION SOURCEBOOK (1987) (in an age of "infocentrics" profitable businesses center around good information).

6. The process of re-evaluation and the likelihood of fundamental changes in current law is inevitable. An influential overview of the issues is provided in U.S. OFFICE OF TECHNOLOGY ASSESSMENT, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION (1986).

creative skill. Outside of work done within the scope of an employee's job,⁷ the governing legal systems intellectual property presume that ownership is in the author, the creative party, but can be transferred to the investor by an explicit contractual agreement. Because there may be a number of financial investors and creative individuals claiming an interest in intellectual property, ownership issues have created increasingly frequent controversy.⁸

Finally, credit laws have a significant influence on investment in information assets. Since this Article is primarily concerned with this influence, let us begin with an explanation of how a credit transaction works.

In a credit arrangement, the investor delivers value, usually in some form of capital and expects repayment of the value by the debtor, along with a return on the investment, such as accrued interest. The creditor relies on the creditworthiness of the debtor (and any guarantors), expecting that the debtor's business operations will be adequate to repay the debt. Usually value (*e.g.*, a loan) will not be delivered unless the investor (*e.g.*, a creditor) obtains additional assurance of payment such as an interest in the debtor's assets as security for the debt or as means to control the business operation. These "secured assets" are usually tangible property, but the value of information assets makes them a potentially important source of security. For the debtor, the feasibility of using information assets as security is based on the extent to which these assets comprise a significant part of the company's value; thus, information assets are most used as security in the financing of software, database, or other information oriented businesses.

Because credit laws influence the cost and risk associated with a loan secured by information assets, they affect both the availability of financing for information oriented companies and the development and marketing of information property.⁹ Credit law is not neutral. It affects investment by increasing or decreasing the risk of credit loss along with the cost of protecting against that loss.

There are two measures of the effectiveness of credit laws. The first is whether credit laws pertaining to intellectual property clearly indicate the legal relationships created. Since a credit transaction is a voluntary exchange, the decision to make a loan reflects an assessment of risk balanced against potential gain. Clarity of law enhances the creditor's ability to assess risks by delineating and converting the legal risks into clear statements of relative position.

7. An employee who develops intellectual property may have some rights in the property. See *Whelan Assoc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222 (3rd Cir. 1986), *cert. denied*, 107 S.Ct. 877 (1987); *Josten's Inc. v. National Computer Systems*, 318 N.W.2d 691 (Minn. 1982).

8. See, *e.g.*, *Aldon Accessories, Ltd. v. Speigel, Inc.*, 738 F.2d 548 (2d Cir. 1984), *cert. denied*, 49 U.S. 982 (1984); *Whelan Assoc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222 (3rd Cir. 1986), *cert. denied*, 107 S.Ct. 877 (1987). See also Dreyfuss, *The Creative Employee and the Copyright Act of 1976*, 54 U. CHI. L. REV. 590 (1987).

9. We make this statement relying on the widespread notion that secured interests facilitate lending, although a few recent articles in the law and economics literature purport to find a lack of theoretical support for this belief. See, *e.g.*, Schwartz, *The Continuing Puzzle of Secured Debt*, 37 VAND. L. REV. 1051 (1984); White, *Efficiency Justifications for Personal Property Security*, 37 VAND. L. REV. 473 (1984).

Conversely, uncertainty regarding the effect of a transaction reduces a lender's willingness to make a loan.

The second measure is whether credit laws minimize the cost and effort required to adequately secure a debt with information assets. It is important that information assets be as economically feasible a form of collateral as other sources of security in the credit marketplace. Disproportionate costs or legal risks in information lending will induce lenders to choose other investments as security, thereby depriving debtors who rely on information assets adequate financing arrangements. Thus, the ease of securing the debt should be sacrificed only if it infringes clear interests that cannot otherwise be protected.¹⁰

Simplified rules and clear statements of rights reduce credit costs and permit effective assessment of risks. For example, in the 1960s, Article 9 of the Uniform Commercial Code (U.C.C.) created a framework to expedite secured commercial lending through simplified, relatively clear cut rules concerning the creation and enforcement of security interests.¹¹ Clarity in the law is especially important when using information assets, since such assets are often ephemeral and changing, giving them uncertain value. The creditor's costs relating to these assets include both how the security interest can initially be created and how that interest can be maintained as the assets are modified and developed over time. The ideal legal system would unambiguously allow a creditor to create and maintain rights in intellectual property on a cost-competitive basis with other assets, and would clearly state how these rights position the creditor if it faces competing claims.

B. The Value of Intellectual Property Rights as an Asset

To understand the issues regarding information based assets, we must distinguish financing based on intellectual property rights from financing based on a debtor's other assets. Simply put, traditional commercial collateral includes either tangible items (*e.g.*, equipment and inventory) or the debtor's rights to receive payment from third parties (*e.g.*, accounts receivable). Along with real property, these two types of assets are the staple of many businesses and are the most common security for commercial loans.¹²

Intellectual property rights do not resemble any of these traditional assets. A patent, for example, is not tangible property nor does it entail a right to receive money. Rather, patents, as well as copyrights, trademarks and other intellectual property, are proprietary rights, *i.e.*, rights of exclusivity and control of technology, information, products, or other work.¹³ Although the right to control differs for the various forms of intellectual property, this right legally defines the asset.

10. In the aggregate, a creditor's costs are passed on to debtors as a group; this directly affects the availability of credit, especially at the margins for potential debtors who cannot afford the cost.

11. See generally 1 G. GILMORE, 2 SECURITY INTERESTS IN PERSONAL PROPERTY §§ 9.1-9.2 (1965).

12. See generally ASSET BASED FINANCING (H. Ruda ed. 1985) (listing many of the areas of commercial secured lending).

13. See generally R. MILGRIM, MILGRIM ON TRADE SECRETS (1987); M. NIMMER & D. NIMMER, NIMMER ON COPYRIGHT (1987); R. NIMMER, *supra* note 2.

For example, the author of a novel holds the copyright of the "work of authorship," which consists of the expression that comprises the novel. The copyright gives the author the exclusive right to make copies of the novel and create derivative works from the original.¹⁴ The author's asset consists of these rights. If the author makes and sells copies of the book, the buyers own the copy, but not the copyright. This ownership gives the buyer a right to read the book, give it to a friend, burn it or sell it, but she cannot make additional copies without infringing the copyright.¹⁵

In copyright, and in all other forms of intellectual property, the value of the property rights depends on the salable value of the technology or product in which they subsist. Consequently, the value of intellectual property often cannot be determined until or unless it is exploited. This is especially troublesome for an information asset whose value depends on the information remaining confidential. The entire law of trade secrets, for example, is built on the premise that a company holding important or secret information can enforce that secrecy against attempted misappropriation.¹⁶ Reconciling a need for confidentiality with a need to appraise value, however, creates severe problems in lending. In addition, intellectual property rights are intangible and change in character and value over time. This uncertainty limits the willingness of lenders to use information assets as collateral, and requires the ideal system to have especially sensitive rules that track the changes and development of value over time.

C. Choice of Information Assets as Collateral and the Law

Intellectual property rights are personal property. They fall generally within the Uniform Commercial Code (U.C.C.) and, for secured lending Article 9 of the U.C.C. Some forms of intellectual property, such as trade secrets, are governed exclusively by state law. In contrast, patent, copyright, and many trademark rights are governed by federal intellectual property statutes. Although the federal system does not deal appropriately with commercial lending needs, it is nevertheless controlling on various issues and preempts state law, at least in part.

When the debtor markets intellectual property, he generates contract rights which shift the applicable body of law from proprietary rights under federal law to contract and priority rights under state law. Just as the sale of inventory transforms collateral from goods to cash or an account, the marketing of intellectual property also transforms the underlying information assets used as collateral. Unlike the case with inventory, however, the debtor can often both market *and* retain intellectual property rights. For example, a novelist who

14. 17 U.S.C. § 106 (1982).

15. Copyright law extends not only to novels and short stories, but also to computer software, databases and most other forms of information. See, e.g., *Apple Computer, Inc. v. Franklin Computer*, 714 F.2d 1240 (3d Cir. 1983), cert. dismissed, 464 U.S. 1033 (1984); 17 U.S.C. §§ 101, 102(a), 117 (1982).

16. See R. MILGRIM, *supra* note 13; RESTATEMENT (FIRST) OF TORTS § 757 (1939) (trade secret is essentially a common law right to control use or disclosure of secret information).

authorizes the reproduction and sale of copies of a book may keep the copyright (intellectual property) while exploiting other rights by selling the tangible item (the book). In many cases, however, the creditor desires a security interest in both the intellectual property and the tangible item.

The author's authorization also has value as security. It may be in the form of a license to produce and market the copies of the novel in return for a royalty. A license conveys mere permission to exercise rights otherwise controlled by the owner of the intellectual property. It contrasts to an assignment, which conveys title in the underlying right (*i.e.*, a sale of the copyright), reserving a right to royalties.¹⁷ In a license agreement, the author retains the copyright, but creates a contract right to receive payments from the publisher.¹⁸ These contract rights may be collateral that has greater value than the copyright itself after the license.

The use or sale of information thus generates various and potentially valuable forms of collateral. When using information assets as security, the parties must sort among the various forms of property and define both the scope and limits of the secured interest. The choice of collateral affects both what risks the lender takes and what law applies.

To illustrate the different types of property that are covered by the term "intellectual property," consider the case of a software company that develops a product we will call SOFTALK I. Table 1 lists only some types of property that might be involved as collateral for a loan to this company:

Table 1: Software Company Assets

Intellectual Property Rights:

COPYRIGHT

- right to reproduce copies of SOFTALK I
- right to develop works based on SOFTALK I

TRADE SECRET

- right to use confidential design of SOFTALK I
- rights in confidential process that developed SOFTALK I

TRADEMARK

- right to use and license name "SOFTALK I"

17. See A. DELLER, 4 DELLER'S WALKER ON PATENTS § 409 (2d ed. 1965).

18. R. NIMMER, *supra* note 2, at 5-4, ¶ 1.03.

Related Assets:

TANGIBLE PROPERTY

- current and future inventory of copies of SOFTALK I
- inventory of subsequent versions of SOFTALK I

INTANGIBLE PROPERTY

- license contracts with end users of SOFTALK I
- license contracts with publisher of SOFTALK I
- license contracts with distributors of SOFTALK I
- license contracts on subsequent versions of SOFTALK I
- accounts receivable from the sale of copies of SOFTALK I

Depending on the particular transaction, a lender and a debtor may want to encumber some or all of the assets of SOFTALK I. Each item on this list has separate value; the rights in each asset may be governed by different bodies of substantive law.

Parties frequently face questions about which legal system applies when they negotiate the form of the lending transaction. The choice of security conveyance often reflects the body of law the parties believe governs the transaction. In practice, parties choose between a security interest or a collateral assignment. Modern security interests, now commonplace in commercial lending, leave the debtor with ownership and control that is subject to a creditor's right of foreclosure. Conversely, a collateral assignment conveys (assigns) title to the lender who grants back a "license" to the debtor. Title reverts to the debtor when the debt is paid. The language of collateral assignment derives from intellectual property law (which deals in assignments and licenses), while a "security interest" implicates U.C.C. considerations.

Although the parties often regard the chosen language as significant, seemingly explicit contract choices may be over-ridden. U.C.C. Article 9 is not controlled by the form of the agreement or contract titles. A security interest is defined to include many personal property "leases," "consignments," many "sales" of accounts, and all "conditional sales."¹⁹ Thus, whether or not the parties use the label of "assignment" on a particular transaction may be irrelevant under Article 9. However, the label can determine the application of federal laws and the scope of their preemption of the U.C.C. section 9-104(a) provides:

This Article does not apply to a security interest subject to any statute of the United States, to the extent that such statute governs the rights of parties to and third parties affected by transactions in particular types of property.²⁰

19. See B. CLARK, *THE LAW OF SECURED TRANSACTIONS UNDER THE UNIFORM COMMERCIAL CODE* §§ 1.2-1.4 (1980); see also U.C.C. § 1-201(37) (1978).

20. U.C.C. § 9-104(a) (1978).

If federal law provides no governing rules, the transaction is subject to the provisions of Article 9.²¹ Federal preemption and the choice of governing law will be discussed more fully later in a discussion of specific forms of intellectual property.²²

II. THIRD PARTY RIGHTS AND LOAN RISKS

From a creditor's standpoint, the value of a security interest in any collateral is determined in part by its market value. As indicated earlier, this valuation is a special problem in dealing with intellectual property because the market value lies partly in the inability of others to duplicate it. The value of a security interest is also influenced by the legal rights or position the creditor holds with reference to the collateral, *i.e.*, the legal conditions and costs associated with enforcing the creditor's rights against the debtor and other claimants who assert rights in the collateral.

Questions of relative position among creditors are described as priority issues in financing law.²³ While a U.C.C. security interest is enforceable between the creditor and debtor from the time that an agreement is established between the parties,²⁴ the creditor's rights against third parties depend on various "priority" rules.²⁵ In turn, the creditor's priority will often depend on whether and when the creditor took steps to "perfect" its interest. In most commercial transactions, perfecting an interest requires that the creditor record that interest in an appropriate public filing system for the particular type of collateral.²⁶

One of the primary functions of priority and perfection rules is to resolve disputes between competing claimants. More importantly, these rules permit effective planning with foreknowledge of what rights or risks accrue to a lender's position.²⁷ Effective planning requires certainty of applicable rules and discoverability of the existence of competing claims. Unfortunately, the governing rules are not always clear.

Current perfection and priority rules regarding intellectual property interests represent an uneasy blend of federal and state law. For patent, copyright, and some trademarks, both federal and state law contain recording rules and some priority of rights provisions that may be applicable. The law is unclear, however, as to whether both sets of rules apply, and to what extent they interrelate.²⁸ This uncertainty exacerbates the underlying question of which elements of intellectual property value are covered in a transaction. Consequently, lenders face a financing environment that often requires duplicative compliance,

21. U.C.C. § 9-104 comment 1 (1978).

22. See *infra* notes 88-115 and accompanying text.

23. See U.C.C. § 9-312 (1978).

24. U.C.C. § 9-203 (1978).

25. U.C.C. § 9-312 (1978).

26. See U.C.C. § 9-401 (1978). The system varies state by state, but generally consists of filing a financing statement either statewide, countywide, or in a title registry.

27. See R. NIMMER, COMMERCIAL ASSET BASED FINANCING ch. 7 (to be published, fall 1988).

28. See, *e.g.*, *Holt v. United States*, 13 U.C.C. Rep. Serv. (Callaghan) 336 (D.D.C. 1973); *In re Transportation Design & Technology, Inc.*, 48 Bankr. 635 (Bankr. S.D. Cal. 1985).

yet retains uncertainty about applicable rights. Accordingly, both costs and risks are increased.

We believe that this field is ripe for limited but explicit federal preemption. Federal law should govern the property rights in copyright, patent, and some trademarks. It should also govern where, when, and what to file to perfect an interest in these properties. Given federal perfection, however, the lender's priority position should then be determined by state law priority rules which already control state intellectual property such as trade secrets and state law trademark rights.

A. Filing Location

To the extent that they are governed by the U.C.C., intellectual property rights are usually treated as "general intangibles."²⁹ Perfecting a security interest in this type of property requires filing of a financing statement.³⁰ The principal question is whether a U.C.C. filing is sufficient to perfect an interest in information assets defined by federal law or whether federal filing is also required. As a practical matter, a creditor must currently file under both systems if uncertain which system applies.

U.C.C. section 9-302(3) provides that:

[t]he filing of a financing statement otherwise required by this Article is not necessary or effective to perfect a security interest in property subject to (a) a statute or treaty of the United States which provides for a national . . . registration . . . or which specifies a place of filing different from that specified in this Article for filing of the security interest.³¹

Thus, an applicable federal registration system preempts U.C.C. filing rules. When this occurs, a U.C.C. filing is not "effective" to perfect an interest in the property rights covered by federal law.

1. Copyrights

The Comment to U.C.C. section 9-104 states that although the Copyright Act permits the "mortgage of a copyright and for the recording of an assignment of a copyright . . . such a statute would not seem to contain sufficient provisions regulating the rights of the parties and third parties to exclude security interests in copyrights [entirely] from the provisions of this Article."³² While the current Copyright Act does not entirely preempt state secured financing law, its filing system apparently does preempt state filing systems. The Copyright Act authorizes filing of "transfers" of registered copyrights³³ and further provides that a "transfer of copyright ownership" includes a "mortgage . . . of a

29. U.C.C. § 9-106 (1978). See *In re Emergency Beacon Corp.*, 23 U.C.C. Rep. Serv. (Callaghan) 766, 772 (S.D.N.Y. 1977) ("debtor's patent rights, trade name, customer lists, books and records and its right to manufacture . . . are general intangibles"); *In re Magnum Opus Elec., Ltd.*, 19 U.C.C. Rep. Serv. (Callaghan) 242, 244 (D.N.H. 1976) (trademarks are general intangibles).

30. U.C.C. § 9-302 (1978).

31. U.C.C. § 9-302(3) (1978).

32. U.C.C. § 9-104 comment 1 (1978).

33. 17 U.S.C. § 25 (1982).

copyright or of any of the exclusive rights comprised in a copyright."³⁴ Under federal law, unfiled transfers are unenforceable against most transferees who have no notice of the unfiled lien.³⁵ This express rule preempts the U.C.C.; a U.C.C. filing cannot perfect an interest in a copyright.³⁶

Unfortunately, federal copyright filing rules contain at least two potential weaknesses. First, no transfer can be recorded until the copyright itself has been registered, which requires a public record deposit of copies of the work.³⁷ This creates a problem for copyrighted works containing trade secret material, such as computer programs, because public disclosure of the secret terminates confidentiality and relinquishes the right to enforce the secrecy claim. Registration which discloses secret materials, whether or not associated with financing, reduces the value of the property. The extent of the harm, however, has been partly reduced by Copyright Office regulations that allow a deposit of material to be edited to reduce (or eliminate) trade secret disclosure.³⁸ In contrast, Article 9 permits mere "notice" filing, in which potential creditors are put on notice as to what "types" of property are covered by the security agreement.³⁹

A second deficiency in the federal copyright filing system is that it inefficiently handles "after-acquired property."⁴⁰ Article 9 filings are recorded under a debtor's name and routinely cover subsequently acquired property within the general description contained in the filing statement. Indexing in the federal system, however, is according to the particular copyright and does not cover after-acquired property in works eligible for separate registration. This could be especially critical in information based properties, since new versions of an original may be even more valuable than the original work. The limited scope of this filing requires the creditor in its security agreement to make and enforce appropriate provisions for refileing when new works are developed, thus imposing additional monitoring and compliance costs not present under the U.C.C.

2. Patents

Perfection of security interests in patents is less clear than with copyrights. The federal Patent Act mandates recording of "assignments, grants and other conveyances" of patents and indicates that:

34. 17 U.S.C. § 101 (1982).

35. See, e.g., 35 U.S.C. § 261 (1982).

36. See, e.g., Note, *Transfers of Copyrights As Security Under the New Copyright Act*, 88 YALE L.J. 125 (1978); M. NIMMER & D. NIMMER, 3 NIMMER ON COPYRIGHT § 10.05[A] (1987). See also Engel & Radcliffe, *Intellectual Property Financing for High-Technology Companies*, 19 U.C.C. L.J. 3, 15 (1986) (copyright rules "probably" preempt Article 9 but the issue is unresolved in the absence of controlling cases). Cf. Bramson, *Intellectual Property Financing*, in ASSET BASED FINANCING 31-23 (H. Ruda ed. 1985).

37. 37 C.F.R. § 201.4 (1987).

38. R. NIMMER, *supra* note 2, at 1.13 (Supp. 1986).

39. U.C.C. § 9-402 (1978).

40. "After-acquired property" is property received by the debtor after the creation of a security interest that the creditor wishes to be incorporated into the existing security agreement. See U.C.C. § 9-204 (1978).

[a]n assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.⁴¹

This statute governs both recordation and priority of interests. Initially it might appear that this federal patent recording system preempts state law as does the Copyright Act, rendering a state filing ineffective. However, it is uncertain if federal law preempts state law in the patent area.⁴²

The uncertainty centers around whether the reference to "assignments" and "grants" includes security interests or refers only to conveyances that transfer title to the creditor.⁴³ When the patent statute was enacted, most secured lending involved transfers of title, but this is no longer common. Since modern day security interests leave title in the debtor, and the federal system records only conveyances of title, the federal system would appear not to apply to security interests nor to preempt Article 9.

Although this issue has not been litigated extensively, the reported cases are in complete disarray. The court rejected the transfer of title distinction and applied the preemptive federal system for recording patent transfers in *In re Otto Fabric, Inc.*⁴⁴ The court held that a U.C.C. filing did not perfect a security interest since the Patent Office maintained an "adequate filing system that entirely preempts U.C.C. filing."⁴⁵ This analysis would place all patent filing activity under a single system. The harm of this analysis flows from the relatively archaic and limited character of patent filing rules and the unsatisfactory way they deal with contemporary security interests.

The opposite result is suggested in *Holt v. United States*,⁴⁶ where the court held that patent filing does not apply to a security interest in a patent application, because a U.C.C. interest does not involve a transfer of title.⁴⁷ Under this analysis, security interests in patents would be governed by Article 9 and must be recorded as a general intangible in state records.

To complete the circle, one bankruptcy court adopted an intermediate position that is difficult to justify under any view of the federal registration system. In *In re Transportation Design & Technology, Inc.*,⁴⁸ the court held that "a security interest is not a conveyance of a present ownership [and] is not required to be recorded with the Patent Office."⁴⁹ Nevertheless, it held that the federal patent system is partly preemptive. Filing in the federal system is

41. 35 U.S.C. § 261 (1982).

42. An unresolved dispute recently led an American Bar Association Committee to recommend an amendment to the Patent Act in order to affirm that filing must be under federal law. Coolley, *Recording of Security Interests in Patents and Trademarks*, 1987 A.B.A. (SEC. PAT., TRADEMARK & COPYRIGHT L. REP. 47-48).

43. See *supra* text accompanying notes 19-21 (discussing the difference between a secured interest and a collateral assignment).

44. 55 Bankr. 654 (Bankr. D. Kan. 1985).

45. *Id.* at 657.

46. 13 U.C.C. Rep. Serv. (Callaghan) 336 (D.D.C. 1973).

47. *Id.* at 339.

48. 48 Bankr. 635 (Bankr. S.D. Cal. 1985).

49. *Id.* at 639.

adequate against all parties, but *not necessary*,⁵⁰ while a U.C.C. filing protects the creditor against judgment liens. This result-oriented outcome meant that *any* filing perfected the security interest against a judgment creditor, such as a trustee in bankruptcy.⁵¹

These cases illustrate the great uncertainty in current law about how to perfect security interests in patents and patent applications. Despite the confusion, one author suggests that federal filing of a collateral assignment under the Patent Act will protect the creditor against all subsequent purchasers of the collateral.⁵² This is true, however, only if a collateral assignment is not treated as a disguised security interest, or if it is decided that federal rules cover security interests in patents. Thus, the only safe approach currently requires recording in both state and federal systems. In the federal records, the lender should record a collateral assignment with license back.⁵³ The U.C.C. recording simply covers an interest in general intangibles,⁵⁴ including but not necessarily limited to, patents and patent applications.⁵⁵

For the lender, the best approach in making the proper double filing may be to use a collateral assignment format in its transaction. A collateral assignment viewed as a whole under the U.C.C. clearly creates a secured transaction, since the label of a transaction does not bar the application of Article 9.⁵⁶ This justifies the Article 9 filing, while the possibility of federal preemption mandates the federal filing as a backup.⁵⁷

3. Trade Secrets

Trade secrets consist of confidential information important to a commercial entity whose disclosure and use are subject to explicit confidentiality restrictions.⁵⁸ The debtor's rights in a trade secret include the right to use the secret information exclusive of any other person who obtained the information from

50. *Id.* at 639-40.

51. *But see* 11 U.S.C. § 544(a) (Supp. 1988) (trustee in bankruptcy can avoid security interests to same extent as a judgment lien creditor).

52. *See* Nicewander, *General Intangibles and Intellectual Property as Collateral*, in SMU INSTITUTE ON THE FUNDAMENTALS OF (COMMERCIAL LENDING (1986).

53. *See* Bramson, *Intellectual Property as Collateral: Patent, Trade Secrets, Trademarks and Copyrights*, 36 BUS. LAW. 1567, 1593-1594 (1981).

54. *See infra* note 61 (defining general intangible).

55. The proper location of a U.C.C. filing varies, depending on which subsections of U.C.C. §[9-401(1) have been adopted by a particular state. *See* U.C.C. § 9-401(1) (1978).

56. *See, e.g.*, U.C.C. § 1-201(37) (1978) (certain leases treated as secured interests for purposes of Article 9).

57. An important caveat involves what interest is claimed as collateral. If the collateral involves royalties received from a license, an interest in the license is not considered an interest in the patent. The security interest in the debtor's contract right is a general intangible that requires a state law filing. Similarly, an interest in the product of a patented process is an interest in goods, not in the patent. Therefore, this interest requires a state law filing, since it is a perfection of an interest in goods.

58. RESTATEMENT (FIRST) OF TORTS § 757 (1939).

the holder and the right to preclude disclosure by such third parties.⁵⁹ Unlike patents and copyrights, a debtor's rights in trade secrets are not governed by federal law.⁶⁰ Filing under Article 9 is clearly mandated.

Trade secret "rights" are considered general intangibles under Article 9.⁶¹ The primary legal problem in using these information rights as collateral involve distinguishing these secrets from the debtor's tangible property or other proprietary rights. For example, with regard to tangibility, in *United States v. Antenna Systems, Inc.*,⁶² the court held that a security agreement extending to inventory, work in progress, contract rights and equipment of a software company did not cover "blueprint and technical data produced when the company's engineering staff designed a product."⁶³ It ruled that data were the visual reproductions of "engineering concepts, ideas and principles [and] are general intangibles" under the U.C.C.⁶⁴ In effect, the court was suggesting that ideas or conceptual attributes dominate intellectual property, making the tangible embodiment of the conceptual attributes inseparable from the attributes themselves.

A similar problem existed in *In re Bedford Computer Corp.*,⁶⁵ but the court suggested a converse outcome. The creditor claimed an interest in the "source code" of a computer program developed by the debtor. The court noted:

If . . . compelled to make a definitive characterization, I believe I would conclude that the software here involved should be characterized as tangible rather than intangible property. [The] source code and object code embodiment of that "technology" cannot exist independent from the actual hardware components to which it gives operational life. The source code does not demonstrate some broad generalized technology or technical principles and ideas, existing apart from a particular tangible machine already in existence, but instead presupposes the bold existence of particular hardware to give the source code any meaning. Moreover, the source code itself is embodied in tangible magnetic media⁶⁶

If the code is a *tangible* item, the proper U.C.C. classification is "goods" (e.g., equipment or inventory). Once again, the tangible embodiment and the underlying concepts are inseparable, but here the tangible attributes dominate.

Such inconsistent analyses reflect a fundamental misconception of rights inherent in intellectual property as opposed to other types of property. Rather than getting bogged down in the tangibility question, courts should ask: "what is the nature of the potential proprietary rights claim to this material?" For example, in *Antenna Systems* and *Bedford*, the technical material was comprised of trade secret and possible copyrightable subject matter. To the extent that the creditor claims the right to disclose, use or copy this proprietary information, the

59. See generally R. NIMMER, *supra* note 2, at 3.02.

60. R. MILGRIM, *supra* note 13, at § 7.02[2].

61. See *United States v. Antenna Systems, Inc.*, 251 F. Supp. 1013 (D.N.H. 1966); *In re Bettinger Corp.*, 197 F. Supp. 273 (D. Mass. 1961). "General intangibles" means "any personal property (including things in action) other than goods accounts, chattel paper, documents, instruments, and money." U.C.C. § 9-106 (1978).

62. 251 F. Supp. 1013 (D.N.H. 1966).

63. *Id.* at 1015.

64. *Id.* at 1016.

65. 62 Bankr. 555 (Bankr. D.N.H. 1986).

66. *Id.* at 567 (emphasis in original).

claim would cover intangible assets. If the creditor merely sought possession of existing copies (e.g., on disk) of the software, however, the claim would be dealing with goods.

A related problem occurs when a creditor provides only partial funding for the debtor or the debtor desires to hold some valuable information outside the secured transaction. In such a case, filing against all general intangibles may reach too broadly, as would a similar description in the security agreement.⁶⁷

4. Trademarks

Trademark rights arise under federal law, state statutes, and common law. We focus here on trademarks that are subject to federal law pursuant to the Lanham Act which provides that:

[a]n assignment shall be void as against any subsequent purchaser for a valuable consideration without notice, unless it is recorded in the Patent and Trademark Office within three months after the date thereof or prior to such subsequent purchase.⁶⁸

Federal regulations provide for registration of assignments and other instruments "which may relate to such marks . . . in the discretion of the Commissioner."⁶⁹

The federal statutory language refers only to recording assignments of federal trademarks and raises similar issues about the choice of an appropriate recording system as do the patent laws.⁷⁰ For example, in *Acme Valve & Fitting Co. v. Wayne*,⁷¹ the court noted that "[in] order for a transfer of rights in a trademark to constitute a sale or assignment . . . the transfer must be absolute and must relate to the entire rights in the trademark."⁷² Thus, if a court concludes that the transaction is an assignment, the Lanham Act recording provisions would control the transaction, preempting and displacing the U.C.C. filing provisions.⁷³

At least one author advocates the recording of a collateral assignment in federal records to perfect an interest in federally registered trademarks.⁷⁴ However, several cases have held that Article 9 applies if the secured transaction does not assign title in fact.⁷⁵ These cases indicate that federal filing is necessary

67. In *Bedford*, the lender lost all claim because it could not distinguish its collateral from other technology developed by the debtor, a point we shall amplify later. *Id.* at 570-71.

68. 15 U.S.C. § 1060 (1982).

69. 37 C.F.R. § 2.185 (1987).

70. See *supra* notes 52-55 and accompanying text.

71. 386 F. Supp. 1162 (S.D. Tex. 1974).

72. *Id.* at 1165.

73. See U.C.C. § 9-104(a) (1978); see also *supra* note 21 and accompanying text (federal preemption of the U.C.C.).

74. See *Bramson*, *supra* note 53, at 1593-94 (filing of a collateral assignment in the federal system is adequate to perfect).

75. See *Engel & Radcliffe*, *supra* note 36, at 20. See generally *In re Roman Cleanser Co.*, 43 Bankr. 940 (Bankr. E.D. Mich. 1984), *aff'd*, 802 F.2d 207 (6th Cir. 1986) (grant of a security interest in a federally registered trademark is not an assignment for purposes of Lanham Act because it is not an absolute transfer of the entire right, title and interest); *In re TR-3 Industries*, 41 Bankr. 128 (Bankr. C.D. Cal. 1984) (compliance with the U.C.C. filing requirements for general intangibles perfects the interest in the trademark since the Lanham Act does not provide for recording of a security interest).

only if there is a current and absolute conveyance of control and ownership to the "lender." Since the debtor owns the collateral in an ordinary security interest until there is a default,⁷⁶ the federal system would be considered as merely a title registry irrelevant to secured financing liens. Once again, the only practical response to ensure perfection is to file in both systems.⁷⁷

Regardless of whether a security agreement or a collateral assignment is used, the transaction must comply with trademark law. Trademark law requires the owner to be able to monitor operations under the trademark. Absent this monitoring, the transaction may be construed as a naked license and therefore potentially invalid.⁷⁸ In a collateral assignment, the "owner" is the assignee, *i.e.*, the creditor. The prohibition on naked licenses materially increases a creditor's cost by requiring this monitoring function.

Federal trademark law also prohibits "assignments in gross."⁷⁹ This means that a trademark cannot be sold or assigned apart from the goodwill it represents, because trademarks are considered meaningless if divorced from their goodwill.⁸⁰ A security interest or collateral assignment is considered an assignment in gross if it is restricted solely to the mark.⁸¹

There is some dispute about how far a transaction must extend beyond the trademark to avoid characterization as an assignment in gross, but recent decisions indicate that the need to extend beyond mere conveyance of the mark can be met with relative ease.⁸² For example, in *In re Roman Cleanser Co.*,⁸³ the Sixth Circuit held that a security interest in a trademark was not an assignment in gross even though the security interest failed to include the machinery and equipment needed to produce the product.⁸⁴ The court noted that it was "of the opinion that the 'goodwill' spoken of in the statute does not mean machinery,

76. Under state law, a trademark is a general intangible. *See, e.g., In re Magnum Opus Elec., Ltd.*, 19 U.C.C Rep. Serv. (Callaghan) 242 (D.N.H. 1976); *see also supra* note 61 (defining general intangible under the U.C.C.).

77. An alternative, suggested in a leading treatise, attempts to bend the collateral assignment to fit the transaction:

One approach . . . would be an agreement to assign the trademarks in the future, conditioned upon a default as defined in the underlying security agreement. This agreement to assign can be part of the mortgage . . . and can also include an irrevocable power of attorney to the . . . "secured party" to execute the assignment on behalf of the debtor in the event of default, should the latter fail or refuse to execute and deliver the assignment. Such a security agreement to assign should be recorded in the United States Patent and Trademark Office so that third parties would be put on notice

3 R. CALLMANN, *THE LAW OF UNFAIR COMPETITION, TRADEMARKS AND MONOPOLIES* § 19.62 (L. Altman 4th ed. 1983).

78. *See generally* *VISA USA, Inc. v. Birmingham Trust Nat'l Bank*, 696 F.2d 1371, 1377 (Fed. Cir. 1982).

79. 15 U.S.C. § 1060 (1982). *See, e.g.,* *Mister Donut of America, Inc. v. Mr. Donut, Inc.*, 153 U.S.P.Q. (BNA) 773 (1967).

80. *See* MCCARTHY, *TRADEMARKS AND UNFAIR COMPETITION* § 18.1 (1973); *see also* *Handler & Lin, How to Perfect Security Interests in Patents, Trademarks, and Copyrights*, 11 U.C.C. L.J. 346, 347 (1978); *Marshak v. Green*, 746 F.2d 927 (2d Cir. 1984); *VISA USA*, 696 F.2d at 1375.

81. *Id.* at 1376.

82. *See* *Hough Mfg. Corp. v. Virginia Metal Indus.*, 453 F. Supp. 496 (E.D. Va. 1978); *cf. VISA USA*, 696 F.2d at 1376-77.

83. 43 Bankr. 940 (Bankr. E.D. Mich. 1984), *aff'd*, 802 F.2d 207 (6th Cir. 1986).

84. 802 F.2d at 209.

and that the transfer of formulas and customer lists, both classic elements of goodwill, along with the trademarks, satisfies the statutory requirement."⁸⁵

It must be remembered that we are no longer dealing solely with federal law if the transaction extends beyond the trademark. There must be a state law filing to cover other elements of the agreement, such as equipment and inventory.

5. *Licenses as Collateral*

In information based lending, debtors often use existing license agreements as collateral. A license contract is typically governed by state law and is not covered by federal filing rules.

If a licensee's rights are used as collateral for a loan to him, the primary problem is defining the value of the rights and whether the license contract itself can serve as collateral. Valuation is simpler if an exclusive license is involved, since the license value matches the value of the underlying property licensed. In effect, the exclusive license creates a property right in the licensee, although it is not explicitly referred to as such.

If the license is non-exclusive, both its value and the licensee's ability to encumber that value change. A non-exclusive license is "personal to the licensee and is not transferable unless it contains words which show that it was intended to be assignable."⁸⁶ To the extent assignability is a precondition to a valid lien,⁸⁷ it eliminates non-exclusive licenses as potential collateral unless the licensor expressly permits the assignment. Even then, the fact that the license is non-exclusive reduces its value and may eliminate it as a possible source of collateral.

In contrast, a licensor's rights in a loan agreement to the licensor clearly can be subjected to a security interest. The licensor may hold a reversionary interest, but more importantly has a contract right to receive royalties. This right to payment can be encumbered under Article 9 as a general intangible. The value of the collateral depends, as any contract right does, on the strength of the underlying obligor's commitment and ability to pay.

B. Priority Issues

Filing and perfection rules ultimately relate to determining a creditor's priority as compared with third parties. The simple fact that an interest was perfected (or not perfected) does not necessarily determine its position or priority relative to all other parties. A creditor's position will be defined by reference to explicit priority rules in federal or state law. Although these rules will

85. *Id.* In *Roman Cleanser*, the creditor originally took a comprehensive lien, but released its interest in the machinery and equipment before the debtor's bankruptcy. See *Roman Cleanser*, 43 Bankr. at 942.

86. A. DELLER, *supra* note 17 at § 409; *Unarco Industries, Inc. v. Kelley Co., Inc.*, 465 F.2d 1303 (7th Cir. 1972).

87. See *supra* text accompanying notes 29-31 (discussing federal filing system requirements).

generally give priority to the claimant who first perfects her interest, federal and state rules are not consistent on this point.

While we propose that federal preemption of state law is appropriate for recording rules concerning intellectual property governed by federal law, we also believe that priority rules should be governed entirely by state law. This is because virtually every financing package involving intellectual property also contains collateral that is subject to state finance laws. Accordingly, an artificial split of priority rules among these packaged rights would unnecessarily invite confusion and uncertainty.

Unlike filing rules, conflicting priority rules under federal and state law cannot always be reconciled or their effect avoided. As a result, determining as a matter of law which priority rules govern the relationship between a creditor and a third party is probably more critical than determining the appropriate filing system.

The structure for analysis of priority rules is similar to that used to examine filing issues. Under both the common law and Article 9, priority rules are preempted to the extent that federal law applies.⁸⁸ Applying this partial preemption rule to priority questions, however, is made difficult because the federal statutes deal with some priority issues, but are silent on others. Silence in a preemptive statute creates ambiguities as to whether state law is permitted to operate in an area not expressly dealt with by federal law. In lien priority issues, the better view is that silence does not indicate a Congressional intention to occupy the field. Otherwise, the field would be governed by no rule at all. State law should appropriately be used to fill the void created by the absence of federal provisions.

There is very little law dealing with preemption by federal intellectual property statutes, but cases dealing with other credit laws have so far indicated that the scope of preemption will be limited to the express language of the federal statute. The most closely related context involves the Federal Aviation Act (FAA).⁸⁹ The FAA contains both registration and priority rules.⁹⁰ The U.S. Supreme Court, in *Philco Aviation, Inc. v. Shacket*,⁹¹ held that federal recording rules preempted state law for security interests in aircraft and other property covered by the FAA. The Court suggested, however, and other courts have subsequently held, that state law priority rules are largely unaffected by federal law.⁹²

The FAA provides that an unrecorded interest in an aircraft is invalid against any person not "having actual notice thereof . . ."⁹³ This defines the effect of an FAA filing. Arguably, the rule expressed could be interpreted to preempt all other priority laws creating a "first to file" rule augmented by actual

88. U.C.C. § 9-104 (1978); see *supra* note 21 and accompanying text.

89. 49 U.S.C. §§ 1301-1542 (1982).

90. 49 U.S.C. §§ 1403-1406 (1982).

91. 462 U.S. 406 (1983).

92. *Id.* at 413; see, e.g., *Aircraft Trading & Services, Inc. v. Braniff, Inc.*, 819 F.2d 1227 (2d Cir. 1987).

93. 49 U.S.C. § 1403(c) (1982).

notice provisions. However, its preemptive scope has been held to be quite narrow. The Supreme Court has noted that:

[State] law determines priorities [but] all interests must be federally recorded before they can obtain whatever priority to which they are entitled under state law.⁹⁴

Thus, for security interests in aircraft and related property, the "only situation in which priority appears to be determined by [federal law] is where the security holder has failed to record his interest."⁹⁵ An unfiled interest is subordinate to all persons lacking actual notice, but a filed interest obtains only the priority given to perfected interests under state law.

This narrow preemption leaves most priority issues to state law, and should be applied in the context of intellectual property interests governed by federal law. Whether or not this will become the rule, however, is a question that remains unanswered.

The extant federal intellectual property statutes partially address priority issues, but in a different manner than under Article 9 of the U.C.C. This is most apparent in the federal rule which permits filing during a grace period to relate back and obtain priority against intervening claims. The U.C.C. bases priority of perfected security interests in the same collateral on a first to file rule.⁹⁶ In conflicts between secured creditors and buyers, a perfected security interest takes precedence over any subsequent buyer of intangibles.⁹⁷ Even an *unperfected* security interest in general intangibles has priority over a subsequent buyer with notice of the security interest.⁹⁸

1. Priority of Copyrights

The federal copyright system is also based on a first to file rule, but contains a grace period where a transfer recorded within a one or two month period after it is made has priority over subsequent transfers if the copyright is registered.⁹⁹ If there is a registration and the first transferee does not record within the grace period, the second transferee takes priority if it (1) filed first, (2) accepted the transfer in good faith, (3) for valuable consideration, and (4) without notice of the prior transfer.¹⁰⁰

This priority system applies to transfers of copyrights and, as we have shown, apparently includes security interests.¹⁰¹ It does not cover non-exclusive licenses, as these are not considered copyright "transfers." As a result, a non-exclusive license takes priority over a competing transfer if the license occurred

94. *Philco Aviation*, 462 U.S. at 413.

95. Scott, *Liens in Aircraft: Priorities*, 25 J. AIR L. & COM. 193, 203 (1958).

96. U.C.C. § 9-312(5) (1978). This is not the rule in transactions involving negotiable instruments, where possession is the only method of perfection. See U.C.C. § 9-304(1) (1978).

97. U.C.C. § 9-301 (1978).

98. U.C.C. § 9-301(1) (1978).

99. 17 U.S.C. § 205(c)(e) (1982). As noted earlier, while copyright holders often register their property, many technology companies keep their information in the form of trade secrets because of concerns about public disclosure of information. See *supra* notes 37-39 and accompanying text.

100. 17 U.S.C. § 205(e) (1982).

101. See *supra* notes 90-95 and accompanying text.

first and is in writing;¹⁰² no recording is required. As with a true personal property lease, the subsequent lender takes subject to the license even if it has no knowledge of its terms.¹⁰³

2. Priority of Patents

The Patent Act permits recording of assignments, grants, and other conveyances of patents and specifies that:

[a]n assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.¹⁰⁴

As previously discussed, this recording statute and priority rule may not apply to security interests at all.¹⁰⁵ If it does, there are numerous unresolved issues concerning the scope of preemption of state priority rules.¹⁰⁶

A narrow preemption analysis, consistent with the FAA cases,¹⁰⁷ would hold that the Patent Act deals only with priority questions involving unrecorded security interests. All other priority questions would fall under state law. Therefore, an unrecorded security interest would be subordinate to a purchaser without notice (although it would benefit from the three month federal grace period for filing), while a recorded interest would have only the priority given such interest under state law.

It is also possible that the Patent Act gives an unrecorded conveyance priority over all parties except mortgagees or subsequent purchasers of the collateral. This results from the omission in the Act of any reference to other parties when it specifies that unrecorded interests are invalid as to specified parties.¹⁰⁸ Thus, giving priority to unrecorded liens over judgment creditors would be consistent with the Act, but contrary to Article 9 rules. The main impact of this interpretation would be that an unrecorded transfer is valid against a trustee in bankruptcy.

It should be noted that the federal recording creates a colorable title until the record is changed. For example, in *Magnuson Industries, Inc. v. Co-Rect Products, Inc.*,¹⁰⁹ after a mortgage on a patent was recorded in the Patent and Trademark Office, there was a compromise of the debt and the Small Business Administration (SBA) returned the patent by assignment to the original party.¹¹⁰ However, the parties did not remove the recording.¹¹¹ The court ruled that the

102. 17 U.S.C. § 205(f) (1982).

103. See *In re Access Equipment, Inc.*, 62 Bankr. 642 (Bankr. D. Mass. 1986). Pursuant to U.C.C. §§ 9-102, 1-201(37) (1978), a true lease is not subject to Article 9.

104. 35 U.S.C. § 261 (1982).

105. See *supra* notes 41-55 and accompanying text.

106. *Id.*

107. See *supra* notes 91-95 and accompanying text.

108. See *Why Corp. v. Super Ironer Corp.*, 128 F.2d 539, 541 (6th Cir. 1942); *Bailey v. Chattem, Inc.*, 684 F.2d 386, 392-93 (6th Cir. 1982).

109. 13 U.S.P.Q. (BNA) 652 (D. Minn. 1981).

110. *Id.* at 654.

111. *Id.* at 656.

SBA could pass title to another party who had no notice of the prior, unrecorded assignment, but that a party with notice could not obtain more than the bare legal title held in constructive trust by the SBA for the debtor.¹¹² In contrast, under the U.C.C., a financing statement conveys no actual or apparent authority to the creditor to convey title of the collateral. It deals only with priority issues.

3. *Priority of Trademarks*

For federal trademarks, the Lanham Act provides that:

An Assignment shall be void as against any subsequent purchaser for a valuable consideration without notice unless it is recorded in the Patent and Trademark Office within three months after the date thereof or prior to such subsequent purchase.¹¹³

The language and effect are essentially identical to the priority rule of the Patent Act.

In a dispute between two secured parties, determining which priority system to use involves answering two questions. First, does the federal filing rule apply? Second, if it does apply, to what extent does it preempt state law? Where both claimants are creditors, the federal rules should apply either to both interests or neither interest.

The patent and trademark rules void an unrecorded interest against any subsequent purchaser of the collateral.¹¹⁴ Consistent with the Court's view in *Philco*,¹¹⁵ this should be interpreted as a limited priority rule that leaves state law to govern all other situations. This limited priority rule contains two important aspects. First, an unrecorded lien is valid against parties with notice of it. This notice-based priority rule goes beyond any similar provision under Article 9. Second, the federal statutes include grace period provisions not found in Article 9. A filing within this grace period preempts the priority of an intervening transfer. Thus, a prudent lender will not advance funds until the grace period has expired and it is assured of priority.

4. *Priority Among Third Party Claimants*

Priority is unclear when the conflict is between a secured lender and another third party claimant (*e.g.*, a buyer or assignee of the intellectual property). Federal rules apply, at least in part, to the rights of an assignee against subsequent buyers or recipients of conveyances. In effect, by recording within the applicable grace period, the assignee has title from the date of transfer. This title has priority over subsequent secured parties whose equitable and legal claims are less substantial than those of a bona fide purchaser.

The patent and trademark statutes refer to validity against purchasers and may not cover secured interests. However, if there were a completed sale

112. *Id.* at 657.

113. 15 U.S.C. § 1060 (1982).

114. *See* 35 U.S.C. § 261 (1982); 15 U.S.C. § 1060 (1982).

115. *See supra* notes 91-94 and accompanying text.

before the secured lender obtained an interest in the property, the probable result is that no property remains for the security interest to reach. This contrasts to a case in which a secured lender creates its interest in the property prior to the completion of the sale. As has been shown, the U.C.C. governs the secured party's rights to the extent that federal law does not apply. The federal rules do not discuss the rights of prior secured parties, but only conveyances arising after the initial assignment. Thus, priority should be determined under Article 9, unless the secured party's claim must be recorded under a federal system.

III. CHARACTER OF THE LENDING TRANSACTION

There are other increasingly important issues concerning debtor and creditor rights in intellectual property. We will discuss four topics: (1) the rights of the parties in the security prior to default, (2) the obligations of the lender following default, (3) the rights of the parties in bankruptcy, and (4) the coverage of after-acquired property rights in developing intellectual property.

In evaluating current law on these topics, an important distinction should be drawn between rules of law that can be altered by contract and those that cannot. In the financing context, one can anticipate the transactions will be structured to control or avoid the negative effects of an unalterable rule.¹¹⁶ The appropriate policy question becomes whether these adjustments in transactional practice are desirable and outweigh the importance of the rule's policy goals. Rules that force costly and unnatural contractual adjustments should not be retained unless important policy reasons justify their existence.

Rules of law that can be altered or affected by contract terms present a different issue.¹¹⁷ These rules will apply unless overridden by the parties in the contract. It is critical that the presumptions be acceptable, predictable, and desirable. They should reflect our best estimation of the outcomes the parties themselves would have reached if they had considered the issue. Unfortunately, archaic intellectual property rules generate undesirable outcomes in a number of situations.

A. Rights Prior to Default

Who owns the intellectual property prior to default or complete performance by the debtor? This question is important because it determines who exercises residual rights of ownership and control not allocated by contract between the parties.

An easy but erroneous analysis relies on the style or label of the transaction. For example, in a collateral assignment the lender receives an assignment of the debtor's intellectual property rights and gives back a license to use those

116. Examples of unalterable rules include U.C.C. section 2-103, which imposes an obligation of good faith in the performance of every contract, and U.C.C. section 2-316, disallowing disclaimer of warranties except in certain circumstances. U.C.C. §§ 2-103, 2-316 (1978).

117. One example would be a rule permitting title to remain in an independent contractor unless the written contract conveys it to the employer.

rights. On the face of the transaction, the lender owns title to the intellectual property and the debtor has only those rights reconveyed to it in the license. While the license usually conveys a full right to use the property in the debtor's business, the lender's retention of ownership has potentially serious implications. For example, if possession of title is determinative, the residual rights of control in the property make the owner-creditor a necessary party to any litigation involving that property.

In contrast, a contemporary security agreement leaves title to the collateral undisturbed. The Official Comment to U.C.C. section 9-101 provides:

This Article does not determine whether "title" to collateral is in the secured party or in the debtor and adopts neither a "title theory" nor a "lien theory" of security interest. Rights, obligations, and remedies under the Article do not depend on the location of title.¹¹⁸

Unless the security agreement provides otherwise, the debtor retains possession and use of the collateral until default. The creditor has only a security interest, not an ownership interest. Upon default, the creditor has an immediate right to take possession of tangible property and the cash flow from intangible property.¹¹⁹

The U.C.C. rules should control if the transaction is a secured transaction. Pre-U.C.C. intellectual property cases, however, indicated that a mortgage may entail a current transfer of ownership.¹²⁰ This permitted mortgages to be recorded as assignments and gave the lender the right to bring a suit for any patent infringement.¹²¹ This analysis, however, embodies outdated law regarding the actions required to transfer or retain title, and emphasizes issues no longer important. The contemporary view follows the U.C.C. in reducing the importance of title and possession. *In re Transportation Design & Technology, Inc.*,¹²² illustrates the modern approach. The court said:

the grant of a security interest is not a conveyance of a present ownership right in the patent and . . . is not required to be recorded with the Patent Office. It is no longer necessary to create a security interest by assignment or transfer of title as was done in the Waterman transaction.¹²³

Thus, the debtor retains most rights in the property under intellectual property law. The creditor is not a necessary party in infringement actions and need not (unless the security agreement so requires) consent to or participate in further licensing of the technology.

This contemporary view leaves uncertain the legal effect of a collateral assignment. Although the assignment purports to convey title, it really creates a security interest. Should courts apply the language of assignment or favor

118. U.C.C. § 9-101 official comment (1978).

119. U.C.C. §§ 9-502(1), 9-503 (1978).

120. *Waterman v. Mackenzie*, 138 U.S. 252 (1891).

121. *Id.* at 260; see also *Curtiss v. United States*, 13 U.S.P.Q. (BNA) 400 (Ct. Cl. 1932).

122. 48 Bankr. 635 (Bankr. S.D. Cal. 1985). See also *In re Otto Fabric, Inc.*, 55 Bankr. 654 (Bankr. D. Kan. 1985) (expressing doubt that a security interest can be treated as a present assignment of rights under current U.C.C. rules); *In re Roman Cleanser Co.*, 43 Bankr. 940 (Bankr. E.D. Mich. 1984) (a security interest in a trademark does not convey immediate rights of use or ownership, but constitutes a form of future assignment contingent on the event of default).

123. *Transportation Design & Technology*, 48 Bankr. at 639.

substance over form? Focusing on substance rather than form is consistent with Article 9 and prevents differences in form from hiding the reality of the underlying transaction. Under the U.C.C., this is particularly evident in litigation concerning equipment leases. If the lessee-debtor has a right to "purchase" the property for a nominal sum, the transaction is treated as a security interest regardless of language that leaves "ownership" in the lessor.¹²⁴ Similarly, a transaction where a "seller" retains title until the debt is paid creates a secured loan under the U.C.C.¹²⁵

If an assignment transaction creates a security interest, then the debtor retains title and control over the property. If the transaction conveys title, the debtor retains only those rights contained in license back provisions.¹²⁶ The typical license precludes sublicensing or assignment by the debtor without the creditor's consent. Unless the license provides otherwise, the creditor must enforce any rights against infringement and cover the costs of perfecting and maintaining the underlying intellectual property right. Although most licenses give these obligations to the debtor, under federal law the creditor-owner remains a necessary party in any intellectual property lawsuit.

B. Rights and Obligations After Default

Transactions also specify a creditor's rights in the event of a debtor's default. If the transaction conveys title to the lender, a default should simply terminate the license to the debtor. Ownership remains in the lender, based on the assignment. In such event, the lender-owner should be free to use the property as it desires, subject to any restrictions created in the original contract. From the debtor's standpoint, the property would be lost upon default. Moreover, unless the agreement provides otherwise, the lender retains an action on the debt while the debtor receives no credit toward the debt for the value of the lost property.

Although this is consistent with the title conveyance in a collateral assignment, one can never assume that a reversion of title in the creditor adequately treats the consequences of default given the Article 9 characterization of collateral assignments as secured interests. This error has been made where the parties characterize the transaction as a lease and believe the transaction will be treated as such by the courts.¹²⁷ If they are wrong, the result is potentially serious liability for the lender for failing to comply with the obligations of a secured lender under Article 9 after default.¹²⁸

124. U.C.C. § 1-201(37) (1978). See generally R. NIMMER *supra* note 2, at ¶¶ 6.14 -6.16.

125. See U.C.C. §§ 1-201, 9-105 comment 2 (1978).

126. In a trademark transaction, if the creditor uses a collateral assignment and license back, the agreement must contain steps to avoid the existence of a naked license by including the right to inspect and monitor the quality of merchandise produced under the license to the debtor. See *supra* note 78 and accompanying text.

127. See *Percival Const. Co. v. Miller & Miller Auctioneers, Inc.*, 387 F. Supp. 883 (W.D. Okla. 1973) (applying 93% of "lease" payments to purchase and holding lessee liable for the full term even if property returned held to be a security interest within the U.C.C.).

128. See R. NIMMER, *supra* note 2, at ¶ 6.15. If the transaction is treated as a security interest and the lessor does not comply with U.C.C. § 9-203, she will not be entitled to enforce her security interest even as against the debtor.

The lender's proper response both in the agreement and its post-default conduct should be to assume the transaction is a secured loan even if characterized as a collateral assignment. It should also assume that federal law does not control. Indeed, in copyright law, a Congressional committee expressly decided that default issues should be left to state law and contractual agreement:

Representatives of motion picture producers have argued that foreclosures of copyright mortgages should not be left to varying State laws, and that the statute should establish a Federal foreclosure system. However the benefits of such a system would be of very limited application, and would not justify the complicated statutory and procedural requirements that would have to be established.¹²⁹

By treating a license as a secured loan in the event of default, the creditor has an immediate right to receive collections from any third party (*e.g.*, a sublicensee) and to take possession of the collateral. If the creditor wants to retain rather than sell the property, it may propose in writing to retain the property in satisfaction of the debt (a procedure called "strict foreclosure"), if the debtor does not object within the statutory notice period.¹³⁰ Otherwise, the creditor must dispose of the property in a "commercially reasonable sale,"¹³¹ which can be either a public auction or a private sale.

As there are no cases dealing with what constitutes a commercially reasonable sale of intellectual property, the contract terms should specify the standards for such a sale. Absent such provisions, the lender has little or no guidance as to market, terms, advertising, and similar issues.

If the intellectual property includes trade secrets, protecting its value requires maintaining confidentiality. A commercially reasonable disposition undoubtedly would require adequate restraints on disclosure imposed on bidders and perhaps buyers. Failure to protect secrecy creates a liability risk, yet non-disclosure drives down the selling price. The parties must also decide whether the debtor can continue to use the secret material. Merely creating a right for the creditor to sell intellectual property to a third party does not necessarily mean that former employees and owners can no longer use the property in their future work.

If the property includes trademarks, the rules concerning prohibition of assignments in gross must be taken into account.¹³² Hence, the purchaser at foreclosure must receive sufficient title and cannot simply buy the rights without adequate supporting material.

129. H.R. Conf. Rep. No. 1476, 94th Cong., 2d Sess. 123 (1976).

130. U.C.C. § 9-505 (1978).

131. U.C.C. § 9-504 (1978).

132. See *supra* note 80 and accompanying text.

C. Rights in Bankruptcy

In a Chapter 11 bankruptcy, the debtor utilizes bankruptcy law to substantially restructure and optimize the value of its assets and liabilities. This is a credit law system designed to control the distribution of value among creditors of an insolvent debtor.¹³³

In Chapter 11 cases, a debtor can review existing contracts, retaining beneficial ones while rejecting burdensome contracts. By permitting the debtor in bankruptcy to affirm or reject certain agreements, the Bankruptcy Code seeks to optimize the value of the debtor's property available for the unsecured creditors. This affects a lender whose loan transaction involved assignment of a license or whose underlying collateral is a license agreement.

The right to select among contracts applies only to executory contracts.¹³⁴ In bankruptcy, an executory contract is a contract in which substantial performance remains to be done on both sides of the agreement such that a breach by either party excuses further performance by the other.¹³⁵ The debtor may either affirm or reject such contracts. Affirmation of a contract indicates that the debtor undertakes to cure defaults and perform the agreement, receiving reciprocal performance from the other party. Rejection, in contrast, is an anticipatory repudiation; it converts the creditor's rights into a claim for damages against the bankruptcy estate.

This treatment of executory contracts affects the enforceability of license agreements. Since patent and similar licenses are treated in nonbankruptcy law as unassignable without the licensor's consent, one bankruptcy court held that a patent license could not be assumed or assigned in bankruptcy.¹³⁶ Under this view, the license would probably terminate as soon as the licensee files bankruptcy. Even if it did not terminate, it would at least not be transferable to a third party.

The Bankruptcy Code provides, however, that a debtor's bankruptcy estate consists of all legal and equitable interests of the debtor.¹³⁷ This expansive definition indicates that intellectual property or technology licenses are property of the bankruptcy estate.¹³⁸ The pertinent question becomes whether or not the license contract is executory. Since the predominant test is whether substantial performance remains due on both sides of the contract, this becomes a factual question that requires analysis of the terms and performance of the agreement.

In a leading article, one commentator noted that most licenses are executory, but in some cases "where there is no express undertaking by the licensor

133. Nimmer, *Executory Contracts in Bankruptcy: Protecting the Fundamental Terms of the Bargain*, 54 U. COLO. L. REV. 507, 509 (1983).

134. 11 U.S.C. § 365 (Supp. 1988).

135. See Countryman, *Executory Contracts in Bankruptcy*, 57 MINN. L. REV. 439 (1973); see generally Nimmer, *supra* note 133, at 511.

136. *In re Alltech Plastics, Inc.*, 71 Bankr. 686, 689 (Bankr. W.D. Tenn. 1987).

137. 11 U.S.C. § 541(a)(1) (Supp. 1988).

138. See *Lubrizol Enterprises v. Richmond Metal Finishers, Inc.*, 756 F.2d 1043, 1046 (4th Cir. 1985); cf., *Harris v. Emus Records Corp.*, 734 F.2d 1329, 1333 (9th Cir. 1984) (under the 1909 act, a copyright license, which creates a mere personal right, is not assignable without permission of the licensor and does not become property of the estate).

the agreement . . . may not be executory because the licensor may have fully performed merely by executing the license . . ."¹³⁹ Although illustrations of this latter point are hard to find, in *In re Monument Record Corp.*,¹⁴⁰ the court held that a recording license contract was not executory.¹⁴¹ The parties had entered into an agreement releasing the performer from his exclusive recording obligations, while reserving to the publisher the right to continue to market previously recorded works.¹⁴² Although the performer had an obligation to refrain from recording during a five-year period any works which were released by the publisher within 120 days of the termination agreement, no such works were released.¹⁴³ The performer had no other obligations.¹⁴⁴ Therefore, the licensor had fully performed by merely executing the license.¹⁴⁵

In technology licenses, performance usually remains to be done on both sides of the transaction for an extended period of time. Appellate decisions suggest both that the license is property of the estate and that the debtor can affirm or reject the license agreement with court approval. The first case to reach this result was *In re Select-A-Seat Corp.*¹⁴⁶ The court held that an exclusive software license was an executory contract.¹⁴⁷ The licensee was required to make royalty payments out of its annual net return from use of the software and any failure to do so would be a material breach of the license.¹⁴⁸ The licensor had a continuing obligation not to license or sell the software to anyone else, since the license was exclusive.¹⁴⁹ Consequently, the court permitted the debtor, as the licensor, to reject the contract.¹⁵⁰

Select-A-Seat illustrates how far courts may reach to find remaining performance sufficient to establish an executory contract. A similar outcome occurred in a nonexclusive technology license in *Lubrizol Enterprises v. Richmond Metal Finishers, Inc.*¹⁵¹ The licensor-debtor owed the licensee continuing obligations that included notifying it of and defending law suits and indemnifying the licensee for certain losses.¹⁵² The licensee owed continuing duties of accounting and royalty payments as well as maintaining the confidentiality of the technology.¹⁵³ As a result, the debtor was allowed to reject the license.¹⁵⁴

In *Lubrizol*, rejection of the license by the debtor removed the rights to the technology from the licensee even though the license provided that it could

139. Countryman, *Executory Contracts in Bankruptcy: Part II*, 58 MINN. L. REV. 479, 502 (1974).

140. 61 Bankr. 866 (Bankr. M.D. Tenn. 1986).

141. *Id.* at 867.

142. *Id.*

143. *Id.*

144. *Id.*

145. *Id.* at 869.

146. 625 F.2d 290, 292 (9th Cir. 1980).

147. *Id.* at 292.

148. *Id.* at 291.

149. *Id.*

150. *Id.* at 292-93.

151. 756 F.2d 1043 (4th Cir. 1985).

152. *Id.* at 1045-46.

153. *Id.* at 1046.

154. *Id.* at 1047.

continue to use the technology despite a breach by the debtor.¹⁵⁵ Bankruptcy law gives the licensee only a right of action for damages against the bankruptcy estate and not a claim for enforcement of the license agreement.¹⁵⁶ In *Select-A-Seat*, the rejection terminated an ongoing exclusive dealing arrangement. The licensee was permitted to retain and sell copies he had already received, but had no right to further performance.¹⁵⁷ In both cases, the damage to the licensee was substantial.

Rejection of a license agreement is ordinarily permitted, notwithstanding such harm to the injured party, because the purpose of the law is to benefit the *bankrupt* and its creditors.¹⁵⁸ While at least one lower court has rejected this policy in favor of a balance that disallows rejection of a technology license central to the licensee's entire business, this balancing analysis is ordinarily not permitted.¹⁵⁹ The lender who advances funds to a licensee may suddenly see its collateral disappear because of the otherwise unrelated event of the licensor's bankruptcy.

A similar risk exists for the borrower in a collateral assignment if the lender enters bankruptcy. In such a case, the lender may be able to "reject" the license and keep the technology. The risk is especially significant where the lender is not an institutional creditor, but rather a financing partnership or similar entity.

In addition to creating a choice between assumption or rejection of executory contracts, bankruptcy law also modifies certain contractual rights in a manner that enhances value to the debtor's estate. Of particular importance to intellectual property transactions, the Bankruptcy Code does not allow a creditor to terminate a contract solely on the grounds that the debtor is bankrupt or has filed for bankruptcy.¹⁶⁰ In addition, the Code gives the debtor a right to cure defaults in the contract so long as the contract was not terminated prior to filing the bankruptcy petition.¹⁶¹ The debtor may affirm that contract at any time before the confirmation of the reorganization plan, unless ordered by the court to act earlier.¹⁶²

Thus, the threat bankruptcy effects on license agreements leads to various adjustments of license contracts that attempt to assure that either the licensor or the licensee maintains access to and control of the relevant information or technology. For a lender, these risks seriously alter the viability of license rights as

155. *Id.* at 1048.

156. 11 U.S.C. § 365 (Supp. 1988).

157. *In re Select-A-Seat*, 625 F.2d 292 (9th Cir. 1980).

158. See Nimmer, *supra* note 133, at 519.

159. See generally *id.*; see also *In re Petur*, U.S.A., 35 Bankr. 561 (Bankr. W.D. Wash. 1983); *In re Chi-Feng Huang*, 23 Bankr. 798, 800 (Bankr. 9th Cir. 1982).

160. 11 U.S.C. § 525 (Supp. 1988). See also Nimmer, *supra* note 133, at 520.

161. 11 U.S.C. § 365(b) (Supp. 1988). See *In re Power Swing Partners*, 9 Bankr. 512, 519 (Bankr. S.D. Cal. 1980) (terminating a patent license prior to filing bankruptcy for noncompliance with royalty provisions was effective); *In re Gordon Car and Truck Rental, Inc.*, 59 Bankr. 956, 960 (Bankr. N.D.N.Y. 1985) (enforcing provision for termination without notice if licensee insolvent and termination occurred before bankruptcy).

162. 11 U.S.C. § 365(d)(2) (Supp. 1988). See *In re Whitcomb & Keller Mortgage Co.*, 715 F.2d 375, 380 (7th Cir. 1983).

collateral for debt. The license becomes a volatile asset that can dissipate in the primary setting in which collateral becomes important: a bankruptcy filing by a debtor. A possible solution would be a rule providing for the creditor and/or licensee to keep some rights to the property despite a filing in bankruptcy by the other party to the license. A Bankruptcy Code provision provides a similar rule for buyers of certain real estate.¹⁶³

D. Access to New Developments

In many cases, the value of intellectual property is determined at least partly by its continued use and refinement. For instance, computer software routinely progresses through several revised versions. Trade secrets change in content, scope, and importance. New patents or patent applications develop from existing technology and further research and development. Consequently, the creditor often desires to incorporate subsequent developments in its security interest. The way to incorporate these subsequent developments varies, however, depending on whether state or federal law controls.

Article 9 provides for easy encumbering of after-acquired property in commercial transactions.¹⁶⁴ In most cases, a security agreement can include after-acquired property by a simple reference to such property.¹⁶⁵ No detailed description is required.¹⁶⁶ A financing statement covers after-acquired property automatically.¹⁶⁷ Even if the agreement does not expressly cover after-acquired property, the U.C.C. gives a creditor rights in all proceeds of its original collateral.¹⁶⁸ This covers any property received on sale or other disposition of the property, but does not include new research developments.¹⁶⁹ There is also a limited right in products of the original collateral if the identity of the original is lost or if the creditor's financing statement specifically claims such products.¹⁷⁰

Federal intellectual property laws are less conducive to interests in after-acquired property because they are not designed to govern finance law issues. Recording under trademark, copyright, and patent law for new developments requires registration for each property.¹⁷¹ This creates compliance and monitoring costs that are mitigated, but not eliminated, by the fact that under federal law, control of the original technology gives control over many new, derivative technologies based on the original.

Collateral assignments ordinarily require that subsequent property be "conveyed" to the creditor. The debtor must notify the creditor of any new development (e.g., a patent application) and make an assignment of rights in the

163. 11 U.S.C. § 365 (Supp. 1988).

164. See *supra* note 40 (defining after-acquired property).

165. U.C.C. § 9-204 (1978).

166. U.C.C. § 9-204 (1978).

167. U.C.C. § 9-402 (1978).

168. U.C.C. § 9-306(2) (1978).

169. See *In re Transportation Design & Technology, Inc.*, 48 Bankr. 635, 641 (Bankr. S.D. Cal. 1985).

170. Such products are termed "proceeds" and are governed by U.C.C. § 9-315 (1978).

171. 15 U.S.C. § 1060 (1982); Note, *Transfers of Copyrights As Security Under the New Copyright Act*, 88 (YALE L.J. 125, 132 (1978)); M. NIMMER & D. NIMMER, *supra* note 36, at § 10.05[A].

new technology. These provisions are enforceable but are clearly more cumbersome than typical U.C.C. provisions. Where the property involves frequent and important changes (such as in software development), the creditor is faced with substantial compliance costs and encounters clear risks of incomplete or unattempted conveyances which may inhibit the use of intellectual property as collateral. These are avoidable risks and costs, but only if federal law is altered to reflect contemporary commercial expectations.

Although not governed by federal law, trade secrets or other technical information create additional problems of attempting to incorporate new developments in a lien. If the debtor intends to grant an interest in *all information*, this can be done easily. Trade secrets are general intangibles under the U.C.C.¹⁷² A collateral description referring to all general intangibles ensures that all such rights are covered. The description, however, does not include related tangible collateral, which must be specifically included in the agreement.

Often a debtor does not desire to encumber all of his property. This creates substantial problems in adequately distinguishing what property is covered and what is not. The difficulty is compounded by a desire to reveal no more about secret information or processes to third parties than necessary.

One recent case illustrates an ineffective effort to distinguish between pre-existing and new technology in an agreement to fund research and development work. *In re Bedford Computer Corp.*¹⁷³ involved a partnership lender financing the development of software products who lost all claim to the software in bankruptcy because its security interest had not been filed. Furthermore, while the agreement provided that the partnership owned new technology developed with its loaned funds, neither the agreement nor the operation of the business identified or distinguished that technology from the debtor's other property.¹⁷⁴ The contract purported to create present ownership in the lender, but because no effort was made to separate the new technology from older technology, the court treated the transaction as a contract for *future* sale, making it insufficient to defeat the claims of the trustee in bankruptcy.¹⁷⁵ The failure to separate the new technology from the old also defeated any claim that the property was held in trust by the debtor, therefore the lender became an unsecured creditor.¹⁷⁶ The court cited a leading Treatise:

A petitioner in reclamation is required to identify positively the property he seeks to reclaim. Where the property sought has been mingled with other goods or property of the bankrupt, the claimant must trace his property. . . . If he fails, he cannot reclaim, no matter what the equities are, and he is relegated to the position of asserting his rights as a general creditor.¹⁷⁷

Suggesting that secret material or information must be described with clarity, as did *Bedford*, does not provide a plausible solution for lenders in similar

172. See *United States v. Antenna Systems, Inc.*, 251 F. Supp. 1013, 1016 (D.N.H. 1966).

173. 62 Bankr. 555 (Bankr. D.N.H. 1986).

174. *Id.* at 562-63.

175. *Id.* at 566.

176. *Id.* at 570-71.

177. *Id.* at 569 (citing 4A COLLIER ON BANKRUPTCY §§ 70.25[2], 70.39[3] (14th ed. 1978)).

situations. Credit law rules treat clarity as an important measure for communicating notice to third parties. But general notice is inconsistent with secrecy law and eliminates any residual value for both parties. Creating a way to segregate and identify intellectual property collateral for third party protection without relinquishing secrecy interests presents fundamental but unanswered problems in technology finance law.

Bankruptcy by the debtor also affects claims to new developments in a more direct and unavoidable manner. Bankruptcy Code section 552(a) provides that:

[e]xcept as provided in subsection (b) of this section, property acquired by the estate or by the debtor after the commencement of the case is not subject to any lien resulting from any security agreement entered into by the debtor before commencement of the case.¹⁷⁸

Under this provision, the lender does not ordinarily have an enforceable claim to new technology developed after the filing of bankruptcy. This is true even if the contract provides for such a claim in the absence of bankruptcy. For example, in *In re Transportation Design & Technology, Inc.*,¹⁷⁹ the court held that under the U.C.C. definition of proceeds, a patent obtained post-petition is not a proceed of a pre-petition patent.¹⁸⁰ The court ruled that the concept of proceeds requires a sale or other disposition of the original property, not merely a further development of its capability.¹⁸¹

The result in *Transportation Design* creates sharp incongruities in dealing with intellectual property rights and credit. It creates a potential separation of property rights that diminishes the value held by both the estate and the creditor. A good solution would be to characterize new developments as proceeds, making them subject to the U.C.C. rules governing security interests applicable to proceeds.¹⁸² This rule traces the proceeds from the original product and provides that a security interest in the original product is effective against subsequent products as well. This rule could easily be expanded to include new developments in intellectual property.

CONCLUSION

Our basic premise is that the increasing value of information as a commercial asset mandates a need to develop consistent financing laws regarding that asset. In part, rules encouraging investment promote continued growth of the information industry and development of new technologies and information assets. Information industry companies, as well as many companies in other contemporary industries, have information assets as a major part of their asset bases. These assets must be usable as a means of obtaining adequate financial support for these companies.

178. 11 U.S.C. § 552(a) (Supp. 1988). The exceptions to this rule focus on property that constitutes proceeds of the original collateral. 11 U.S.C. § 552(b).

179. 48 Bankr. 635, 641 (Bankr. S.D. Cal. 1985).

180. *Id.* at 641.

181. *Id.*

182. U.C.C. § 9-306 (1978).

Credit laws in this field should promote and expedite the use of information assets as collateral, but current rules governing intellectual property do not meet this goal. In order to use credit laws to facilitate investment in information assets, the system should have characteristics which are noticeably absent today. First, the law regarding the creation, enforcement, and relative priority of interests in information collateral should be clear and susceptible to effective planning. Second, the rules should reduce the costs associated with compliance and monitoring. Current law fails in both respects.

Our current legal framework for protecting information assets is quite unclear and leads to unpredictable results. Most of the uncertainty stems from attempting to reconcile the law and practice of intellectual property fields with related state credit laws under the U.C.C. At present, it is impossible to accurately predict which body of law governs registration of interests in patents or trademarks. It is equally unclear the extent to which the relative priority of interests in these types of property, as well as copyrights, are governed by federal or state rules.

The questions of filing and priority are analytically separable and that separation provides a way of solving the current problems. For registration and filing, federal systems should be the preemptive method for copyrights, patents, and federal trademarks. This is because patent, trademark, and copyright filing systems cover not only security interests, but other transfers as well. Even if intellectual property security interests were filed under state law, the federal records would still have to be consulted. Therefore, placing security interests exclusively within the federal filing systems would centralize the issue. This solution, however, requires legislation to clarify the coverage of the older federal systems. Legislation is also necessary to alter these antiquated filing systems, particularly in their treatment of after-acquired property. A rule that requires commercial entities to re-record interests in new products that were developed from existing technology with an existing security agreement imposes unnecessary cost with no discernible gain.

In contrast to registration rules, foreclosure and priority questions should be handled under state law. Such a result already occurs for registration of aircraft and interstate vehicles. Priority rules must accommodate an array of different interests in property. This accommodation would be facilitated by using state law. If state law governs, however, current federal provisions regarding grace periods for delayed filing should be reconciled with Article 9 of the U.C.C. The grace periods in current federal law are at least partly explained by the fact that those systems cover the rights of owners in addition to lenders. Various reconciliations could be adopted with no one methodology being clearly superior. The grace periods could be removed from federal law, creating a "first to file" rule. Alternatively, the grace periods could be retained and expressly treated as a relation back to the filing as if it occurred on the original date to which the grace period relates. However, a grace period imposes several months of uncertainty on any party transacting business with the intellectual property owner. For creditors, uncertainty is potentially damaging, but can be accommodated if the actual scope and effect is known. For example, funds can be held in escrow during the grace period to protect the parties.

These reactions to the current legal structure impose costs on the transaction and, as we have said, one objective of financing law should be to minimize a creditor's costs of compliance except where the costs are justified by important and explicit competing interests. Costs in intellectual property financing come from treatment of after-acquired property and double filing rules as well as from the underlying uncertainty of the law in this field. Insofar as possible, credit laws governing intellectual property should parallel contemporary notions about commercial financing as expressed in Article 9 and other state law rules.

Even if the law became clear and the costs reduced, intellectual property and information based financing involves many conceptually difficult and potentially complex issues. In many cases, the distinction between intellectual property and other related rights is unclear, and what a creditor desires or obtains as collateral becomes obscured in the distinction. We have discussed only some of these issues in this Article. Much more work remains to be done.

The basic theme we wish to leave with the reader is that legislative action is urgently needed to clarify and simplify intellectual property finance law. The practical issues discussed in this Article are accentuated and made more significant by archaic and poorly drafted laws. In an information age characterized by rapidly changing information technologies, this condition cannot be allowed to continue without detriment to all facets of information based financing.

AN EMERGING THEORY OF COMPUTER SOFTWARE GENERICISM

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I. INTRODUCTION

Computer software copyright holders have gained a monopoly profit windfall from recent court decisions that incorrectly classify the copyrightable and uncopyrightable aspects of computer programs. Of the three forms of intellectual property protection—patent, copyright, and trademark—only patent protection should enable the holder to earn monopoly profits. To ensure that copyright protection does not allow monopoly profits, the courts and Congress have developed the “idea-expression” distinction. Copyright protection extends only to expressions, not ideas.¹ An expression is one of several available ways to express an idea. Because alternative expressions of the same idea are “available,” extending copyright protection to one expression of an idea will not allow monopoly profits to accrue to the copyright holder.

Recently however, several courts have decided whether an alternative expression was “available” by asking only if it were technically possible. This approach fails to take into account the economic premises and objectives of copyright protection. When differentiating expressions from ideas, however, courts must inquire whether an alternative expression is economically, as well as technically, feasible. To prevent copyright protection from allowing monopoly profits, copyright law should borrow from trademark law the concept of “genericism” to test the competitive realities of enforcing a copyright in computer software. Only in this way can courts evaluate the actual market consequences of enforcing a copyright and thereby advance the goals underlying the Copyright Act.

The doctrine of “genericism” has developed within trademark law to ensure that trademark protection does not allow profits above those resulting from producer identification. When a trade name becomes synonymous with a product in the eyes of consumers, it has become generic. Trademark protection of the name will be denied because the protection would provide economic

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1. See *infra* notes 33-51 and accompanying text.

benefits beyond producer identification. In this way trademark law recognizes the actual market consequences of trademark protection.

Similarly copyright should be enforced only if it allows other persons to compete in the marketplace.² In light of the legislative purposes underlying copyright, focusing on competitive consequences is appropriate.³ Any idea-expression analysis therefore should consider the customer demand for an alternative appearance or operational aspect. If customers strongly resist using an alternative, the appearance or operational aspect of the software has become a generic standard for the industry. Copyright should not protect such generic aspects, just as trademark does not protect generic product names.⁴ Following the trademark analogy, we call this process computer software genericide.

Exploration of this computer software genericide concept begins with a review of the proper role of intellectual property protection in a competitive market.⁵ Here, the rationale for trademark genericide theory and the parallel aspects of copyright and trademark are analyzed. Next, attention is directed towards the role of copyright in computer software protection, and how it achieves its purpose through the delicate task of protecting expressions but not ideas.⁶ In this discussion, recent cases are analyzed for consistency with espoused principles of competitiveness. This review leads to an evaluation of the propriety of extending trademark genericide principles to copyright, and the potential impact of such an extension.⁷

II. PATENT, TRADEMARK, AND COPYRIGHT PROTECTION

Patent, trademark, and copyright protection balance incentives for innovation against promotion of free market competition. Pursuing one of these objectives to the exclusion of the other could cause a serious misallocation of resources. The patent, trademark, and copyright systems therefore incorporate mechanisms to help strike a healthy balance.

A. Incentives to Innovate and the Right to Imitate

Few, if any, inventors will create and disclose ideas if the ideas can be freely copied by competitors.⁸ An inventor will not risk time and money to

2. See, e.g., *Atari, Inc. v. North Am. Philips Consumer Elec. Corp.*, 672 F.2d 607, 616 (7th Cir. 1982); *Whelan Assoc. v. Jaslow Dental Lab*, 797 F.2d 1222, 1235-36 (3d Cir. 1986); *Digital Communications Assoc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449, 457-58 (N.D. Ga. 1987); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127, 1134 (N.D. Cal. 1986).

3. See R. NIMMER, *THE LAW OF COMPUTER TECHNOLOGY*, § 1.02[3], at 1-5, 1-8, 1-9 (1985); R. POSNER, *ECONOMIC ANALYSIS OF LAW*, § 13:6, at 282 (1972). See also *Whelan*, 797 F.2d at 1235.

4. No provision in the Lanham Act explicitly states that generic marks cannot be registered. However, the definition of "trademark" in the Act requires that the mark be able to distinguish the goods of the applicant from those of other producers. Lanham Act, 15 U.S.C. § 1127 (1982). Since a generic mark refers to an entire range of goods in a product class, it cannot serve to distinguish one source of that good from another.

5. See *infra* notes 8-32 and accompanying text.

6. See *infra* notes 33-79 and accompanying text.

7. See *infra* notes 80-93 and accompanying text.

8. See Goldstein, *The Competitive Mandate: From Sears to Lear*, 59 CALIF. L. REV. 873, 878 (1971) ("[A]lthough short-range competitive interests would benefit from immediate and free public access to technological and artistic innovation, to permit such access would destroy incentive to innovate;

create an idea if, when the idea proves commercially attractive, others may take a "free-ride" on the inventor's investment. Absent protection for her idea, an inventor might not invest in creative efforts, thereby stifling inventive activity. To avoid this situation, some protection must be offered to inventors as an incentive to generate and use new ideas.

Nevertheless, open access to ideas plays an important role in the United States economy.⁹ The ready availability of ideas allows individuals other than the inventor to enhance disclosed concepts, thereby improving the welfare of both those individuals and society.¹⁰ For example, after a new product is introduced competitors will try to achieve short-term supranormal profits by improving the product or improving production techniques to reduce manufacturing costs.¹¹ As a result, net social welfare will increase, either because the price of the product falls, the social cost of production¹² falls, or the value of the product rises.

The patent, trademark, and copyright systems grant innovators exclusive use of their innovations to overcome the natural investment disincentives caused by the free-rider effect.¹³ Their interference with the competitive marketplace is minimized, however, by the difficulty of satisfying the prerequisites for protection, and the limitations on the extent and duration of their exclusivity.

new products and works would not be introduced into the market and consequently the long range competitive situation would decline.").

9. See, e.g., *Lear, Inc. v. Adkins*, 395 U.S. 653, 668 (1969) ("[F]ederal law requires that all ideas in general circulation be dedicated to the common good unless they are protected by a valid patent."); *Graham v. John Deere Co.*, 383 U.S. 1, 6 (1966); *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225, 230-31 (1964); *Compco Corp. v. Day-Brite Lighting, Inc.*, 376 U.S. 234, 237 (1964); *American Safety Table Co. v. Schreiber*, 269 F.2d 255, 272 (2d Cir. 1959) ("[I]mitation is the life blood of competition."), *cert. denied*, 361 U.S. 915 (1959).

10. See, e.g., *Eastern Wine Corp. v. Winslow-Warren, Ltd.*, 137 F.2d 955, 958 (2d Cir. 1943) ("[T]here is a basic public policy, deep-rooted in our economy and respected by the courts, resting on the assumption that social welfare is best advanced by free competition. . ."), *cert. denied*, 320 U.S. 758 (1943); *Vegeahn v. Guntner*, 44 N.E. 1077, 1080 (Mass. 1896) (Holmes, J., dissenting) ("[F]ree competition is worth more to society than it costs.").

11. The possibility of supranormal profits will stimulate competitors to pursue these tactics. "Supranormal profits" represent a return on investment in excess of that obtainable on other ventures of similar risk. See J.P. GOULD & C.E. FERGUSON, *MICROECONOMIC THEORY* 244 (5th ed. 1980). Product improvements by a competitor will help insulate the competitor from direct competition until others have duplicated the improvements. Techniques which reduce production costs will permit a manufacturer using these techniques to earn supranormal profits at prevailing prices until others adopt the same technologies and reduce their prices. Imitators who simply lower prices will shift demand to their products, thereby earning supranormal profits as long as the price remains above the ultimate competitive equilibrium. The supranormal profits will be of limited duration since competitive equilibrium will be restored when average costs, which include a normal return to capital, equal revenues.

12. "The social cost is also known as the alternative or opportunity cost of production. For example, in producing a commodity *x*, a manufacturer takes people and goods away from the production of commodity *y*. The social cost of producing *x* is that less of *y* (or *z*) is produced for society's consumption." *Id.* at 173-74.

13. See 35 U.S.C. § 154 (1982). See, e.g., *Mazer v. Stein*, 347 U.S. 201, 219 (1954) ("The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in 'Science and useful Arts.'"); Goldstein, *supra* note 8, at 878.

B. Patent Protection

The patent system encourages inventors to disclose their inventions to the public by providing a patent holder with a seventeen-year period during which no unauthorized person may make or use products incorporating the protected idea.¹⁴ To obtain patent protection the inventor must reveal the information required to make and utilize the invention so that when the patent expires competitors will be able to introduce products based on the disclosure.¹⁵ Thus, the patent holder exchanges complete disclosure for an opportunity to earn monopoly profits during the period in which the holder's idea is protected.¹⁶ These profits, since they exceed the normal competitive return to capital, may allow the inventor to recover the research and development costs required to bring the idea to market. In nearly all circumstances, the seventeen-year period of protection should be long enough to overcome the free-rider problems for inventors. The incentive to innovate resulting from a grant of exclusivity, however, is realized at a cost to consumers, who pay higher prices and enjoy fewer improvements in the idea during the protection period. Conferring exclusive rights for a limited time, combined with requiring complete disclosure, balances incentives for inventors against the general public's interest in having ideas freely available for use.

Moreover, because a monopoly period may interfere significantly with an efficient allocation of resources in a market economy, either by diverting resources to the monopolist or otherwise wasting them, patent protection is difficult to obtain. To receive a patent an inventor must undertake a lengthy and expensive process to prove that the idea is useful, novel, and non-obvious.¹⁷ Obviously, if other components of the intellectual property system could be used to protect these ideas, then the exacting requirements of the patent system might easily be circumvented. Therefore, copyright and trademark must not provide the same protection for ideas that patent law does, without imposing comparable restrictions and obligations.¹⁸

14. See REPORT OF THE PRESIDENT'S COMM'N ON THE PATENT SYSTEM, *To Promote the Progress of . . . Useful Arts*, 1-3 (1966), reprinted in P. GOLDSTEIN, (COPYRIGHT, PATENT, TRADEMARK AND RELATED STATE DOCTRINES 19-20 (1973); Kahn, *The Role of Patents*, in COMPETITION, CARTELS AND THEIR REGULATION 311 (J.P. Miller ed. 1962).

15. 35 U.S.C. § 112 (1982); *Ansul Co. v. Uniroyal Inc.*, 448 F.2d 872 (1971) (sufficient disclosure enables a person skilled in the art to make and use the product without undue experimentation), *cert. denied*, 404 U.S. 1018 (1982).

16. The use of the term "monopoly" is not technically precise. The inventor may still face competition from others who use different methods, and thus the inventor may not enjoy the power to control prices or exclude competition that characterizes a monopoly in its legal sense. See *United States v. E.I. duPont de Nemours & Co.*, 351 U.S. 377, 391 (1956); *American Tobacco Co. v. United States*, 328 U.S. 781, 811 (1946).

17. 35 U.S.C. §§ 102, 103 (1982). Obtaining and preserving a patent can be very costly. The statutory minimum fees are \$800 before the patent issues, plus \$2400 to maintain the seventeen-year protection period. Also, attorneys' fees often run in the tens of thousands of dollars. Note, *Defining the Scope of Copyright Protection for Computer Software*, 38 STAN. L. REV. 497, 504 (1986) (citing 35 U.S.C. § 41 (1982)).

18. Cf. *Baker v. Selden*, 101 U.S. 99, 102 (1879); Note, *The Broad Sweep of Aesthetic Functionality: A Threat to Trademark Protection of Aesthetic Product Features*, 51 FORDHAM L. REV. 345, 353 (1982); Note, *The Public Interest and the Right to Copy Nonfunctional Product Features*, 19 WM. & MARY L. REV. 317 (1977).

C. Trademark Protection

Trademark law grants a different measure of exclusivity than patent law, and makes that exclusivity subject to different limitations.¹⁹ If unlimited product imitation were permitted, competitors might copy product characteristics or symbols which are used by a certain manufacturer to assure customers of the source of their purchases. This phenomenon could result in severe market inefficiencies.²⁰ Without trademark protection, customers who are pleased by the quality of a manufacturer's product might incur expensive "search" costs to locate that manufacturer's product again; competitors, especially low-cost imitators, may have duplicated all obvious distinguishing features of the desired product.²¹ In other words, imitators might free-ride on a manufacturer's investment in quality control by passing off their low-cost product as that of the original manufacturer. In this event, the manufacturer would have little incentive to perform these desirable services.²² Thus, free imitation might result in fewer product quality investments by manufacturers, and more arduous shopping tasks for customers.

Trademark law attempts to rectify these problems by granting manufacturers the exclusive right to employ product characteristics or symbols which serve to distinguish their goods from those of competitors.²³ Unlike the patent and copyright laws, trademark law does not interfere with the ability to make a product, but only the ability to confuse others as to its identity or origin. Consequently, trademark law should not protect marks when they might confer benefits beyond identification. For instance, granting a manufacturer the sole use of a generic name such as "lite beer" or "shuttle" might allow that manufacturer to derive profits based solely on certain marketing advantages which the common name provides.²⁴ The common law therefore provides no protection for generic marks, and the federal trademark statute prevents registration of generic names.²⁵

19. See, e.g., Burgunder, *Trademark Registration of Product Colors: Issues and Answers*, 26 SANTA CLARA L. REV. 581, 586-89 (1986).

20. See, e.g., *id.* at 589-91.

21. See Burgunder, *An Economic Approach to Trademark Genericism*, 23 AM. BUS. L.J. 391, 392-93 (1985); Folsom & Teply, *Trademarked Generic Words*, 89 YALE L.J. 1323, 1336 (1980).

22. The Senate Committee on Patents stated in its Report to Congress on the Lanham Act:

Trade-marks [sic] encourage the maintenance of quality by securing to the producer the benefit of the good reputation which excellence creates. To protect trade-marks [sic], therefore is . . . to secure to the business community the advantages of reputation and good will by preventing their diversion from those who have created them to those who have not.

S. REP. NO. 1333, 79th Cong., 2d Sess. 1 (1946), reprinted in 1946 U.S. CODE CONG. & ADMIN. NEWS 1274, 1275.

23. Lanham Act, 15 U.S.C. §§ 1052, 1127 (1982).

24. See *Miller Brewing Co. v. Jos. Schlitz Brewing Co.*, 605 F.2d 990 (7th Cir. 1979) (registering "lite beer"), cert. denied, 444 U.S. 1102 (1980); *Eastern Air Lines v. New York Air Lines*, 559 F. Supp. 1270 (S.D.N.Y. 1983) (registering "shuttle" for airline service). See generally Burgunder, *supra* note 19, at 593; Burgunder, *supra* note 21, at 396-402; Folsom & Teply, *supra* note 21, at 1337 ("[T]he use of generic words as trademarks creates an entry barrier that enhances the ability of the firm holding the generic mark to charge supracompetitive prices.").

25. See *WSM, Inc. v. Hilton*, 724 F.2d 1320, 1327 (8th Cir. 1984) ("WSM cannot deprive others of the right to call a product or service by its generic title"); *Abercrombie & Fitch Co. v. Hunting World, Inc.*, 537 F.2d 4, 9 (2d Cir. 1976) (a user "cannot deprive competing manufacturers of the product of the right to call an article by its name"); Lanham Act, 15 U.S.C. § 1052(e)(1) (1982).

D. Copyright Protection

Expressions, like ideas, are subject to free-riders in an environment of free access. Artists might be unwilling to invest the effort required to create expressions without some guarantee that they would have an opportunity to reap sufficient rewards from their endeavors.²⁶ To this end, the copyright laws protect expressions of ideas fixed in tangible form, by granting a copyright holder the exclusive right to copy those expressions for her life plus fifty years.²⁷

Copyright protection, unlike patent protection, can be obtained easily. No registration is required.²⁸ The creator of an original work displaying some modicum of creativity only need ensure that the proper form of notice is appropriately displayed.²⁹

Copyright protection is easier to acquire than patent protection because the value of a patent theoretically far exceeds the value of a copyright. A patent provides exclusive rights to exploit an idea. In contrast, the copyright statute provides, "In no case does copyright protection for an original work of authorship extend to any idea"³⁰ Thus, a patent holder can derive monopoly profits through exclusive ownership of an idea, but a copyright holder only derives protection of one of numerous ways to possibly express an idea. This idea-expression distinction is designed to provide something less than monopoly protection in the competitive framework. The degree of incentive derived from the copyright roughly corresponds to the profits enjoyed by an oligopolist who

A generic trademark may affect consumer purchase decisions because its exclusive employment by one firm may cause consumers to question whether competing products are in the same product class. Rather than engage in the search to determine whether competing goods will meet their needs, they may simply opt for the good which bears the name they understand. For discussions of these economic effects see Burgunder, *supra* note 19; Burgunder, *supra* note 21; Folsom & Teply, *supra* note 21.

26. See P. GOLDSTEIN, *supra* note 14, at 8-19.

27. 17 U.S.C. §§ 102, 106, 302 (1982). Since the copyright statute clearly provides that expressions are protected, but ideas are not, "ideas" must be distinguished from "expressions." This has been among the most controversial aspects of traditional copyright cases, and has proved no less difficult in connection with computer software.

After determining that the plaintiff's work is expression, the court considers whether the defendant copied those expressions. The Copyright Act only protects expressions from being copied and, unlike patent law, does not prevent others from independently conceiving of the same expressions. See, e.g., *Whelan Assoc. v. Jaslow Dental Lab*, 797 F.2d 1222, 1232 (3d Cir. 1986).

A plaintiff usually lacks direct evidence that the defendant copied her work. Instead, the plaintiff can show that the allegedly infringing work is "substantially similar" to the plaintiff's and that the defendant had access to the plaintiff's work prior to completing the development. The factfinder must then decide whether such indirect evidence of copying, based on access and substantial similarity, proves that copying occurred. See, e.g., *Digital Communications Assoc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449, 464 (N.D. Ga. 1987) ("Because copying is ordinarily impossible to prove by direct evidence, it is usually proven indirectly by evidence of a defendant's access to the copyrighted work and substantial similarity between the plaintiff's and the defendant's works.").

Not all copying, even from copyrighted works, should be condemned. Most improvements are conceived with previous works in mind. See, e.g., Letter from Sir Isaac Newton to Robert Hooke (February 5, 1675/6) ("If I have seen further [than you and Descartes] it is by standing upon the shoulders of Giants.").

28. 17 U.S.C. § 408(a) (1982).

29. 17 U.S.C. § 401 (1982).

30. 17 U.S.C. § 102(b) (1982).

competes vigorously to sell a product that differs slightly from others available in terms of tangential characteristics.

Given these considerations, copyright protection theoretically never should be legally enforced under conditions which would entitle the owner to long-term monopoly profits. Instead, the creator should have to depend on patent or some other form of protection to insulate the work from competition.³¹ This philosophy as to the proper role of copyright, adopted by the courts over a century ago, is currently under attack in that idea-expression twilight zone called computer software "look and feel."³²

III. BALANCING COPYRIGHT PROTECTION AND THE SCOPE OF ITS APPLICATION: THE IDEA-EXPRESSION DICHOTOMY

The idea-expression dichotomy delineates subject matter which must be protected by patent (ideas) from that which may be protected by copyright (expression). So long as protection is sought only for one of several viable means of expression, only the limited price for copyright must be paid and the lengthy protection term provided by copyright may be enjoyed.³³ On the other hand, to obtain the exclusive right to exploit an idea, with the resulting potential for monopoly power, the more demanding disclosure requirements of the patent process must be endured and protection will be granted for only a limited term. Correctly distinguishing an idea from an expression thus becomes essential if the patent and copyright protection systems are to keep their intended economic balances.

A. Theoretical Considerations

The Copyright Act of 1976 provides that copyright protection extends only to original works fixed in tangible media of expression, and in no case extends to any ideas, systems, methods of operation, or principles.³⁴ When seeking copyright protection for any given work, therefore, one must separate the

31. See, e.g., *Herbert Rosenthal Jewelry Corp. v. Kalpakian*, 446 F.2d 738, 742 (9th Cir. 1971) ("When the 'idea' and its 'expression' are thus inseparable, copying the 'expression' will not be barred, since protecting the 'expression' in such circumstances would confer a monopoly of the 'idea' upon the copyright owner free of the conditions and limitations imposed by the patent law.").

32. The "look and feel" of a program is a benchmark by which the similarity of allegedly copied computer programs can be measured. Courts have been vague in precisely defining the elements that compose a program's "look and feel." See *Pinheiro & Lacroix, Protecting the 'Look and Feel' of Computer Software*, 1 HIGH TECH. L.J. 411, 420 (1986). See, e.g., *Data East USA, Inc. v. Epyx, No. C-86-20513-WAI*, slip op. (N.D. Cal. June 10, 1987); *Whelan Assoc. v. Jaslow Dental Lab*, 797 F.2d 1222, 1237 (3d Cir. 1986); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986). See generally Note, *Defining the Scope of Copyright Protection for Computer Software*, 38 STAN. L. REV. 497 (1986); Comment, *Protecting Computer Software: Lessons from the Chip Act*, 1986 ARIZ. ST. L.J. 337 (1986).

33. Copyright protection can be obtained at no cost simply by applying the proper notice of copyright on all published copies of the work. To bring an infringement action and obtain additional statutory rights, however, the copyright must be registered with the United States Copyright Office. 17 U.S.C. §§ 401(b), 501-04 (1982).

34. 17 U.S.C. § 102 (1982).

expression, which is subject to protection, from the idea, which is in the public domain.

A work's idea can be distinguished from its expression at several different conceptual levels.³⁵ Judge Learned Hand first articulated this concept as a spectrum of increasing levels of abstraction progressing from expression (less abstract) to idea (more abstract). According to Judge Hand, "upon any work . . . a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out."³⁶ The most abstract level consists of "no more than the most general statement of what the [work] is about, and at times might consist only of its title . . ."³⁷ Judge Hand ruled that somewhere between the exact expression and this most abstract level, "there is a point in this series of abstractions where they are no longer protected, since otherwise the [author] could prevent the use of his 'ideas,' to which, apart from their expression, his property is never extended."³⁸

If the lowest level of abstraction were used to delineate ideas from expression, the "idea" of a literary work would be described as relating a tale using a particular plot in a given sequence using certain defined characters who interact and have experiences in a determined way. The expression would thus be viewed as the exact words used to tell the story. Copyright would only prevent others from using those same words to relate the tale.

Alternatively, the line between idea and expression could be drawn at a more abstract level. The "idea" could be to relate a story about a particular subject matter using certain characters who are involved in a particular series of undetermined experiences. Here, the expression would encompass the particular sequence of adventures and incidents used to convey those basic plot elements. In this case, the copyright would be more valuable, preventing others from duplicating not only the exact words, but also many of the scenes depicted in the story.

To expand the scope of expression to include an even higher level of abstraction, the "idea" may be simply to relate a story about a particular topic, while the expression would include the entire plot, as well as all the characters, incidents, and language. Under this interpretation, the work's copyright protection would require others to tell their stories using completely different plot concepts, characters, and language. In other words, the more abstractly one identifies the "idea" of a given work (*i.e.*, a "love story," as opposed to a "story about a young girl who falls in love with a young man from a rival family"), the more the remaining elements of the work (all that is entailed in conveying the story) are viewed as expression and can be protected.

35. See, e.g., *Sid & Marty Krofft Television Prod. v. McDonald's Corp.*, 562 F.2d 1157, 1163 (9th Cir. 1977).

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

37. *Id.* at 121.

38. *Id.*

A levels of abstraction analysis similarly can be applied to distinguish ideas from expression in computer software. For instance, the following progression from a low to a high level of abstraction might be used to distinguish expressions from the idea in a word processing program.

1. At the lowest level of abstraction, the idea is to create a marketable word processing program that interacts with the user and manipulates data in a particular fashion, using a particular logic framework, which includes not only a particular structure, sequence, and organization, but particular algorithms and sub-routines as well. The expression, therefore, is the exact code only.
2. At a higher abstraction level, the idea is to create a marketable word processing program that interacts with the user and manipulates data in a particular fashion, using a particular logic framework, which includes the particular structure, sequence, and organization. The expression consists of the code, algorithms, and subroutines used to carry out this logic framework.
3. At a still higher abstraction level, the idea is to create a marketable word processing program that interacts with the user and manipulates data in a particular fashion. The structure, sequence, and organization of the program, are expression.
4. Still more abstract, the idea is to create a marketable word processing program. The structure, sequence, and organization of the program, as well as the methods of data manipulation and user interaction, are the expression of that idea only to the extent each is not indispensable to the program's ability to compete in the word processing program marketplace.
5. Even more abstract, the idea is to create a word processing program. At this level, customer appeal or utility is not a component of the idea. As with the fourth level, the structure, sequence, and organization of the program, as well as methods of data manipulation and user interaction, are the expressions of that idea. The difference is that the expression used will be protected even if indispensable to the marketability of a word processing program.
6. At the highest level of abstraction, the idea is to create a program. Word processing, in and of itself, is protected as an expression.

Obviously, the copyright holder and those who wish to build on the copyrighted program have conflicting interests as to which level of abstraction should be used to distinguish the program's idea from its expression. For example, abstraction level six best protects the developer of a computer program; abstraction level one benefits subsequent programmers. Unfortunately, no satisfactory theory has been formulated for selecting the proper abstraction level even for traditional literary works. Thus, little guidance exists for such a decision in the more complex context of computer software.³⁹

Recent court interpretations of the copyright laws have used abstraction level five to distinguish ideas from expressions in computer software. In other words, the structure, sequence, and organization of a computer program, as well as the manner in which the software interacts with the user, are typically protected against copied programs that are perceived as substantially similar by consumers and/or experts. Many scholars designate protection at this high abstraction level as "look and feel" protection.⁴⁰ Thus, courts currently provide copyright protection not only to literal computer programs, but routinely bestow far-reaching copyright exclusivity by protecting the very look and feel of those programs.

Although the courts have focused on the high end of the abstraction spectrum, fortunately, in so doing, they have also considered the proper role of copyright in the free market. Before providing extensive protection to a program at the level of its structure, sequence, and organization, some courts have been mindful that copyrights are designed to provide sufficient monetary rewards to induce creative expression without granting monopoly power. Therefore, these courts have agreed that programs will not be protected as expressions of an idea when no other conceivable methods exist to express that idea.⁴¹ In this event, the idea and the expression are said to merge, and thus copyright protection will be denied at the level of abstraction under consideration.⁴² When several suitable expressions exist, protecting one of them will not allow the copyright holder to earn long-term monopoly profits. Instead, the best that the copyright holder can achieve in the long-run is an oligopolistic return, assuming that other firms can enter the industry by using the alternative

39. See, e.g., *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d 487, 489 (2d Cir. 1960) (the distinction will "inevitably be *ad hoc*"); Knowles & Palmieri, *Dissecting Krofft: An Expression of New Ideas In Copyright?*, 8 SAN FERN. V.L. REV. 109, 126 (1980).

40. See *Krofft*, 562 F.2d at 1157; *Data East USA, Inc. v. Epyx, Inc.*, No. C-86-20513-WAI, slip op. at 16 (N.D. Cal. June 10, 1987); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127, 1137 (N.D. Cal. 1986); Pinheiro & Lacroix, *supra* note 32, at 421-22. See generally Davis, *Special Problems in 'Look and Feel' Copyright Cases*, 1986 COMPUTER LAW INSTITUTE 741 (1986); Russo & Derwin, *Copyright in the 'Look and Feel' of Computer Software*, 2 COMPUTER LAW. 1 (Feb. 1985); Siegel & Derwin, *Copyright Infringement of the 'Look and Feel' of an Operating System by its Own Applications Program*, 4 COMPUTER LAW. 1 (1987).

41. See *infra* notes 69-73 and accompanying text.

42. *Atari, Inc. v. North Am. Philips Consumer Elec. Corp.*, 672 F.2d 607, 616 (7th Cir. 1982); *Krofft*, 562 F.2d at 1167-69; *Herbert Rosenthal Jewelry Corp. v. Kalpakian*, 446 F.2d 738, 742 (9th Cir. 1971); *Digital Communications Assoc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449, 457-58 (N.D. Ga. 1987).

expressions. This, as noted above,⁴³ is a proper level of incentive under the copyright system.

When the idea and its expression are indistinguishable at a given level of abstraction, the copyrightable elements of the program should be confined to those identified at a lower level of idea abstraction. For example, if only one means exists by which users may interact with a program to accomplish the program's task, copyright protection should not extend to those interactive elements. Copyright protection should be limited to the program's other expression components. This limitation appropriately recognizes that enabling users to interact in a particular and necessary fashion is a component of the program's idea, not protected expression.⁴⁴

Courts analogously applied this multiple expressions test in various contexts prior to the debate regarding computer software copyrightability. For instance, characters and scenes indispensable to the telling of a story always have been denied copyright protection, even when other plot structures and participants in the literary work were granted exclusivity.⁴⁵ Obviously, if protection extended to elements which potential customers considered indispensable, then competitors would be unable to compete in the market. Historical accounts traditionally have been denied protection because there is only one way to tell the truth.⁴⁶ To give to an historian the sole right to relate historical facts would be to provide him with a monopoly because readers of history are interested in facts, not fiction. Likewise, blank forms are not protected when they are required to employ an idea.⁴⁷ Again, by granting exclusivity in the sale of the forms, a copyright would provide a monopoly over the idea itself since competitors could not achieve the idea's objectives without use of the forms.⁴⁸

The multiple expressions test was developed to prevent a copyright from engendering a monopoly position in the market. Copyright protection should not be granted whenever such protection would prevent other firms from effectively competing in the marketplace. Ensuring that multiple expressions exist is especially important in the computer software context, where functional and artistic elements can be inextricably intertwined. Thus, determining whether other means exist to accomplish a task (*i.e.*, express an idea) should only be the start of the inquiry. One must look further and consider whether an alternative program can only accomplish the same function at such slow speed or great cost that potential customers will not buy it. With such functional products as computer programs, one must investigate whether customers will in fact use the alternative expressions before one can conclude that

43. See *supra* notes 30-31 and accompanying text.

44. When distinguishing ideas from expressions, courts refer to the merger doctrine, the "plurality of expressions" test, and the level of abstractions concept. These are not mutually exclusive approaches, as some authors infer, see, e.g., Pinheiro & Lacroix, *supra* note 32, at 419-30, but closely related perspectives concerning the same concept.

45. See, e.g., *Hoehling v. Universal City Studios, Inc.*, 618 F.2d 972, 979 (2d Cir. 1980), *cert. denied*, 449 U.S. 841 (1980); *Alexander v. Haley*, 460 F. Supp. 40, 45 (S.D.N.Y. 1978).

46. *Hoehling*, 618 F.2d at 974, 979.

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

48. *Id.* at 103-104.

copyright will not grant monopoly power. If an attribute of a program is indispensable to the sale of any program created to achieve an objective, then that attribute should not receive protection.

Recognizing that a proper theory of copyright protection must include market considerations is consistent with the basic function of copyright: to protect expressions and not ideas. Thus, as discussed above,⁴⁹ the proposition that multiple potential expressions are a precondition to the protection of any of those expressions has been widely accepted by most courts.⁵⁰ Nevertheless, some courts have recently heightened the abstraction level at which they determine protected expression to a point where potential marketability of alternatives is irrelevant.⁵¹

B. Recent Case Applications

Whelan Associates, Inc. v. Jaslow Laboratory, Inc.,⁵² decided by the Third Circuit Court of Appeals, has become pivotal in modern computer software copyright law. Whelan Associates created a program, written in one programming language, to aid Jaslow Laboratory's office in dental office administration. Jaslow agreed to use its best efforts to market the program and Whelan agreed to attempt to improve the program. Two years after the agreement, Jaslow translated Whelan's program into another computer language so it could run on computers used in smaller dental labs. The two programs had structural similarities, based on file organization, screen outputs, and subroutines, although there were certain differences in programming style, programming, data structures, and algorithms. The sale of Jaslow's program in competition with Whelan's formed the basis of the lawsuit.⁵³

In analyzing this case of first impression,⁵⁴ the Third Circuit distinguished the idea behind Whelan's program from its expression by using the following rule:

49. See *supra* notes 41-42 and accompanying text.

50. Also, it is now clear that the substantial similarity test, see *supra* note 27, must be applied not in terms of the general public, but rather in terms of potential users of the work. See, e.g., *Atari*, 672 F.2d at 619; *Krofft*, 562 F.2d at 1166-67; Note, *Copyright Infringement Actions: The Proper Role of Audience Reactions in Determining Substantial Similarity*, 54 S. CAL. L. REV. 385 (1981). This, likewise, is an acknowledgement that copyright protection must be viewed in light of market realities. In a similar vein, an analysis of actual competitive impacts has been elevated to being the primary determinant of the applicability of the fair use defense. See *Sony Corp. of America v. Universal City Studios*, 464 U.S. 417, 450 (1984) ("[A] use that has no demonstrable effect upon the potential market for, or the value of, the copyrighted work need not be prohibited in order to protect the author's incentive to create."). Unfortunately, the courts' recognition of market principles in these contexts does not ensure that they will apply them consistently. Such has especially been the case in computer software protection cases.

51. Such is the position explicitly taken by the court in *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1253 (3d Cir. 1983) ("If other methods of expressing that idea are not foreclosed as a practical matter, then there is no merger. . . . [C]ommercial and competitive objective[s] . . . [do] not enter into the somewhat metaphysical issue of whether particular ideas and expressions have merged."), cert. dismissed, 464 U.S. 1033 (1984), and followed *sub rosa* by subsequent courts.

52. 797 F.2d 1222 (3d Cir. 1986).

53. *Id.* at 1225-27.

54. *Id.* at 1224.

- 1 The idea is the purpose or function of the program.
- 2 The expression is everything that is not necessary to the function of the program, including the structure, sequence, and organization of the program.⁵⁵

For Whelan's program, the idea was identified as the creation of a computer program which serves as an aid to the business operation of a dental lab.⁵⁶ The expression was identified as the manner in which the program operates, controls, and regulates the computer in receiving, retaining, correlating, and producing useful information either on a screen, print-out, or by audio communication.⁵⁷ Thus, the Third Circuit separated expressions from ideas at a more abstract end of the abstraction spectrum; the expression includes almost everything that the computer does.

In broadly defining the expression to include only those elements not necessary to the function or purpose of the program, the court acknowledged that protection of indispensable elements would inappropriately grant monopoly power to the copyright holder.⁵⁸ Thus, the court noted that where various means can be employed to achieve the same purpose, any one of those means is expression.⁵⁹ In *Whelan*, the court found that the structure of the program was not essential because other dental lab programs were on the market which employed different structures.⁶⁰

Although the existence of other programs is relevant, it should not have disposed of the issue. The court should have analyzed whether these other programs were as desirable or efficient as the *Whelan* model, given a relevant price range. Possibly these programs were on the market before Whelan's and Jaslow's programs, and would soon become hopelessly obsolete due to the Whelan program's uniquely superior concepts of how to arrange dental office information. The court therefore may have entitled Whelan to monopoly profits, a result sanctioned only by the patent system.

*Digital Communications Associates, Inc. v. Softklone Distributing Corp.*⁶¹ followed in *Whelan's* footsteps. The *Softklone* court considered whether Softklone's program, which employed a status screen format identical to Digital's, infringed Digital's copyright in its screen display. The court held that the process or manner by which the screen operated was the idea, but the arrangement of information on the status screen was an expression of that idea.⁶² The court included in its formulation of the idea the use of a status screen to reflect the

55. *Id.* at 1236.

56. *Id.* at 1238.

57. *Id.* at 1238-39.

58. *Id.* at 1237 ("The rule proposed here, which allows copyright protection beyond the literal computer code, would provide the proper incentive for programmers by protecting their most valuable efforts, while not giving them a stranglehold over the development of new computer devices that accomplish the same end.").

59. *Id.* at 1237.

60. *Id.* at 1238.

61. 659 F. Supp. 449 (N.D. Ga. 1987).

62. *Id.* at 458-59.

status, a command driven program, and typing two symbols to activate a command.⁶³ The expression, therefore, consisted of the order and arrangement of the commands, as depicted on the status screen, including the choice of symbols, their placement, and the means used to emphasize them.⁶⁴ Since programmers position information on a screen in various ways, use many symbols to represent such information, and employ several methods to emphasize the symbols, such as highlighting, underlining, or brackets, the court concluded that Digital's status screen was not indispensable to a computer communications package.⁶⁵ Because these elements were protected expression, *Softklone's* copy violated the copyright.

Like the *Whelan* court, the court in *Softklone* correctly observed that the potential plurality of ways to display information on the screen has an important bearing on whether one of those ways deserves copyright protection. However, the court should have determined whether consumers would accept these other formats. The court observed that "[o]ne of the elements of . . . [Digital's] system that has enabled it to receive such widespread support is its distinctively designed 'status screen' screen display."⁶⁶ It follows that a system display could become the standard in the marketplace and no other display would be marketable at equivalent prices. Although it may have been only one of several technically possible ways to represent data when first introduced, through consumer use and acceptance the Digital system may have become the only marketable method. In this way, the manner in which data was displayed on the screen may have become an uncopyrightable idea for the development of which others have a right to compete.

Another recent case granting broad copyright protection to computer software is *Broderbund Software, Inc. v. Unison World, Inc.*⁶⁷ Broderbund was the exclusive licensee of a copyrighted program called "The Print Shop" which helped users create customized greeting cards, signs, banners, and posters. When Unison developed a similar program called "Printmaster," Broderbund sued for copyright infringement.⁶⁸

The court decided that the idea of The Print Shop was the creation of greeting cards and similar graphic products by a variable combination of text and graphics.⁶⁹ Unison alleged, however, that any program designed to create graphics for cards, signs, and banners must have a user interface substantially similar to The Print Shop.⁷⁰ Thus, it argued that the interface was indispensable to the idea and that merger was established. The court, however, was not persuaded because one other program, "Stickybear Printer," also printed greeting cards, but used a different interface.⁷¹ Based on this evidence, the court found

63. *Id.* at 459.

64. *Id.* at 459-60.

65. *Id.* at 462-63.

66. *Id.* at 452.

67. 648 F. Supp. 1127 (N.D. Cal. 1986).

68. *Id.* at 1129-31.

69. *Id.* at 1132.

70. *Id.*

71. *Id.*

for Broderbund, concluding that the copied portions of its program were protected expression.

Two other computer software copyright cases show more sensitivity to the effect that protection would have on opportunities for competition. In *Plains Cotton Cooperative Association of Lubbock Texas v. Goodpasture Computer Service, Inc.*,⁷² plaintiff moved for a preliminary injunction to prevent Goodpasture from marketing a cotton information software system which was substantially similar to Plains', except that it was designed to operate on personal computers rather than mainframes. The Fifth Circuit affirmed denial of the injunction partly because the similarities may have been demanded by consumers of cotton information software.⁷³ The court stated that "market factors play a significant role in determining the sequence and organization of cotton marketing software, and we decline to hold that those patterns cannot constitute ideas in a computer context."⁷⁴ Thus, the court inferred that if users preferred data to appear in a specific format (like a cotton recap sheet), other formats might not be able to compete with Plains'.⁷⁵ Therefore, protecting Plains' format might grant it monopoly power in the cotton information software market.

The conclusion in *Plains Cotton* was influenced by *Synercom Technology, Inc. v. University Computing Co.*⁷⁶ In *Synercom* the court analyzed the scope of Synercom's copyright protection in computer data format cards. University Computing designed a computer program which required data to be inputted in the exact order as punched on the plaintiff's cards. The plaintiff alleged that this violated its copyright because the defendant's program did no more than translate the cards' expression (that is, its data sequence) into a computer program.

The court considered whether the idea of the cards was to input data in any sequence or to input data in Synercom's sequence.⁷⁷ The court held that the idea of the format card was to input data in Synercom's sequence, and thus that sequence was not protected by copyright.⁷⁸ The court analogized Synercom's situation to the creator of the figure H stick shift pattern. Although initially many patterns would perform the required shifting task, after a manufacturer selected the H pattern, others could copy it freely. The court based this finding on the hardship to drivers of different stick shift patterns.⁷⁹

Generally, the *Synercom* court recognized that once consumers are comfortable with a product attribute, they may be unwilling to use competing products that employ alternative forms of that attribute. In this situation, protecting the feature which consumers desire would be unfair. Similarly, on *Synercom's* facts, the court must have considered the hardship to consumers who want to use a competitor's program. If Synercom's cards were protected

72. 807 F.2d 1256 (5th Cir. 1987).

73. *Id.* at 1262.

74. *Id.* at 1262.

75. *Id.* at 1263 n.4.

76. 462 F. Supp. 1003 (N.D. Tex. 1978).

77. *Id.* at 1008.

78. *Id.* at 1013-14.

79. *Id.* at 1013.

consumers would need to make new input cards before they could run another program. Thus, the input format of the cards was held to be an unprotected idea.

The levels of abstraction analysis, plurality of expressions test, and merger doctrine have developed to ensure that copyright not grant monopoly power. Although the recent computer software cases articulate a concern that copyright should never entitle a holder to monopoly power, many courts misapply the various tests, apparently because they have not adequately conceptualized the functional (and thus competitive) significance of a program's "look and feel" and the proper level of incentives for copyright protection. The proper issue is not whether other expressions are *possible*, but whether other expressions are *marketable*.

The *Synercom* and *Plains Cotton* courts seem to have understood this issue. In *Whelan*, *Softklone*, and *Broderbund*, the marketability of the allegedly infringing products should have been investigated thoroughly before the court determined that adequate substitutes existed for the "look and feel" aspects for the allegedly infringed products. In *Softklone*, the users may have become so conditioned to Digital's screen format, or the cost of learning to use another format may have become so prohibitive, that the Digital format should have entered the public domain. The court also should have inquired whether other screen formats really were as applicable to consumer uses as the court hypothesized. Although it seems unlikely, the position of the information on the screen may have been dictated by the needs of the users, and thus all other possible displays would have been inferior and noncompetitive.

Objections to the court's analysis in *Broderbund* mirror those in *Whelan* and *Softklone*. The existence of one other format may not prove the existence of several ways to perform the function of creating cards and banners. More importantly, consumers may not perceive Stickybear Printer and The Print Shop as being at least minimally interchangeable. For instance, Stickybear Printer may be designed for children while Printmaster and The Print Shop may be organized for adults. Stickybear Printer may be for advanced users, while Printmaster and The Print Shop may be for novices. Clearly, the court should not have protected Broderbund's interface format based on such a superficial analysis of market conditions.

If courts insist on protecting software at high levels of abstraction, they should at least recognize that marketability is part of the program's idea, and thus move copyright protection from the fifth level of abstraction to the fourth. At this level, courts, when evaluating whether other expressions exist to accomplish the program's idea, must ask whether those alternative methods are marketable, based on consumer tastes and uses. If the evidence shows that customers will not buy programs that use the alternative forms of expressions, whether for utilitarian or aesthetic reasons, then the expression has become the idea. Drawing a parallel from the trademark system, under these circumstances the expression has become a generic representation of the idea itself. In this event, copyrightable expression should be confined to a lower level of abstraction.

IV. A DOCTRINE OF SOFTWARE GENERICIDE

Recent court opinions have interpreted the Copyright Act to provide broad protections to computer software. In essence, the structure, sequence, and organization, as well as the interactive aspects of computer programs, are protected from anyone who develops copies that are so sufficiently similar that they have the same look and feel as the original program. Such protection will only be enforced, however, if other means are available to achieve the same objectives of the program. The key question which remains, and for which the courts appear to be composing differing opinions, is whether the marketability of those alternatives is relevant to the inquiry. We believe that it must be.

Trademark principles demonstrate how market considerations should affect the extent of copyright protection of computer software. The trademark system provides a range of protection: generic or common names receive no protection, while descriptive words, arbitrary names, and fanciful and imaginative names receive increasing protection.⁸⁰ A generic name can be defined as the word or one of a small set of words which consumers understand as the common expression for a class of products.⁸¹ Both federal and common law deny trademark protection to generic marks.⁸² Further, the federal trademark law provides that a mark that becomes generic will be canceled upon petition.⁸³ This doctrine, trademark genericide, recognizes that customers, either because of shifting intrinsic demand patterns or because of reactions to marketing efforts, may no longer treat a mark solely as a tool for product identification differentiation, but may also consider it a new generic designation for a product.

Typically, genericism results from marketing efforts designed to lead consumers to believe that the registrant's product is superior to competing products. For example, the name "thermos," although fanciful when first registered,

80. The Lanham Act permits registration of almost any name by which the goods of the registrant may be distinguished from the competitive goods of any other producer. The most important exceptions are generic words, which may never be registered, and descriptive words, which may be registered only after they become distinctive of the applicant's goods. 15 U.S.C. § 1052 (1982). *See, e.g.,* *Abercrombie & Fitch Co. v. Hunting World, Inc.*, 537 F.2d 4, 9-11 (2d Cir. 1976) (a manufacturer may choose a word along a continuum ranging from generic to merely descriptive to suggestive to arbitrary or fanciful).

81. *See, e.g.,* *Miller Brewing Co. v. G. Heileman Brewing Co.*, 561 F.2d 75, 79 (7th Cir. 1977).

82. The primary thrust of the federal trademark statute is to facilitate enforcement of common law unfair competition principles, rather than introduce significant new substantive rights. One objective of common law unfair competition policy is to prevent one company from palming off a product as though it were made by another. *Goodyear India-Rubber Glove Mfg. Co. v. Goodyear Rubber Co.*, 128 U.S. 598 (1888). Companies which knowingly employ the identification characteristics of a competitor in order to deceive consumers as to the source of their products are guilty of unfair competition. *Gage-Downs v. Featherbone Constr. Co.*, 83 F. 213 (C.C.W.D. Mich. 1897).

Federal registration eliminated the first element of proof by providing nationwide constructive notice of the claim to the mark. 15 U.S.C. § 1072 (1982). In most other respects the federal trademark statute embodies the common law principles of unfair competition. *See, e.g.,* *In re Deester Concentrator Co., Inc.*, 289 F.2d 496 (C.C.P.A. 1961); Burgunder, *supra* note 19, at 588. Section 43(a) of the Lanham Act (15 U.S.C. § 1125 (1982)) even provides federal unfair competition protection to identifying characteristics that have not been registered.

83. Lanham Act, 15 U.S.C. § 1064(c) (1982) (provides that a petition to cancel a mark may be filed "at any time if the registered mark becomes the common descriptive name of an article or substance. . .").

became generic over time, partly because of the marketing policies of the registrant.⁸⁴ In this situation, the mark might confer on the manufacturer possibilities to achieve profits above those attributable to producer identification. Allowing King-Seely to continue to be the exclusive user of the "thermos" name could have hurt competitors offering vacuum bottles because consumers may not have been sure that their differently named bottles would perform the same functions as a "thermos." Therefore, the common law protection ends, and the federal trademark statute provides for the cancellation of its protection when a mark becomes a product's generic designation.

Likewise, firms which have distinctive names attached to patented products often encounter genericism problems.⁸⁵ When the patent expires, consumers may be so conditioned to refer to the product by the trademark that no other name will be adequate to market a competing product. Under these conditions, the name becomes free for all to use.

Just as trademark law denies protection to generic names, copyright law should deny protection to "generic" program features. Here, a generic feature is the one feature or one of the few features which customers demand to achieve an objective. As with trademark, the inquiry must focus not on the reason for such demand, but on how copyright protection of the generic feature might allow the holder to earn unfair profits.

The copyright system permits above normal profits, but forbids monopoly profits. Thus, a feature will be generic unless consumers view other techniques as reasonably competitive.⁸⁶ Courts must decide whether customers will use programs employing alternative features, assuming their price is within a relevant price range.

Some courts have explicitly applied trademark principles in copyright cases. For instance, in *Atari, Inc. v. North American Philips Consumer Electronics Corp.*,⁸⁷ the central figure of PAC-MAN, the "gobbler," was considered copyrightable expression because it was a wholly fanciful creation. The court observed that fanciful expressions merit the strongest protection, in contrast to relatively simple themes which merit the least.⁸⁸ The trademark principle of giving greater protection to nondescriptive features⁸⁹ is reflected in the copyright case of *Data East USA, Inc. v. Epyx, Inc.*⁹⁰ In *Data East*, a California District Court noted that many constraints are inherent in the sport of karate, and depictions of those constraints are not protected because they "cannot be characterized as fanciful, or imaginative."⁹¹

84. *King-Seely Thermos Co. v. Aladdin Indus.*, 321 F.2d 577, 579 (2d Cir. 1963).

85. *See, e.g., Bayer Co. v. United Drug Co.*, 272 F. 505 (S.D.N.Y. 1921) ("aspirin"); *Haughton Elevator Co. v. Seeberger*, 85 U.S.P.Q. (BNA) 80 (Comm. Pat. 1950) ("escalator").

86. It has been argued under an economic approach to trademarks that a trademark should not be registered if the name, itself, might yield supranormal profits. *See Burgunder, supra* note 21, at 396. Thus the mark must be perfectly substitutable with many other names in terms of its power to attract customers.

87. 672 F.2d 607, 618 (7th Cir. 1982).

88. *Id.* at 617.

89. *See supra* note 80.

90. No. C-86-20513-WAI, slip op. (N.D. Cal. 1987).

91. *Id.* at 10.

The trademark system analogy should be extended so that the doctrine of genericide will apply to copyright cases. If a once arbitrary expression becomes generic over time, then the copyright holder should lose the right to prevent others from copying it. In this context, "becomes generic" means that customers will no longer use a variety of other programs or program features to accomplish their objectives. The expression will become a standard in the market: the idea itself. Other firms must have access to that idea to reasonably compete.

Suppose a hypothetical company, "Softtouch," develops a word processing program which depicts erasure of a file by showing a sheet of paper ripped along a diagonal axis on the terminal screen. Under current views, the idea of such a program would be to indicate that a file is being erased and the expression would be the ripping page. Thus, the ripping page is copyrightable as long as other means exist to indicate that a file is being erased. Without doubt, there are many ways to express this idea. Trash cans, burning pages, and the like, all do the job. However, this does not necessarily mean that copyright should protect the ripping page.

Whether the ripping page is copyrightable should depend on whether it is generic or fanciful. One must analyze whether customers would reasonably use word processing programs which employ other methods to indicate a file is being eradicated. Market surveys would aid in this task. Evidence that other programs were sold to the relevant class of customers while Softtouch's program was on the market is also probative. Such evidence parallels trademark genericism theory, which finds probative evidence that other firms are surviving without using the alleged generic name.⁹²

Assume that the ripping page feature was a protected expression. Over time, however, this feature gained the overwhelming favor of the target audience, either because consumers naturally came to appreciate the ripping page representation more than other forms, or because advertising techniques successfully led them to believe that this method was superior. Whatever the reason, if competitors can no longer sell their word processing programs without this feature, copyright protection should be withdrawn. Otherwise, Softtouch would enjoy a monopoly in the industry. In effect, what was once an arbitrary expression of the idea of file erasure has become the idea of depicting file erasure by a ripping page. In this event, copyright genericide has occurred.

V. CONCLUSION

The intellectual property regime has been developed to increase net social welfare by attacking free-rider problems. The tripartite system of patent, copyright, and trademark is designed to permit a variety of protection and potential returns. Thus, a patent entitles a holder to monopolize an idea, and as a result earn monopoly profits. A copyright entitles its holder to exclusively employ one of several available means to express an idea. In this way, copyright might result in supranormal profits, but at a level that falls short of monopoly profits.

92. See, e.g., *Salton, Inc. v. Cornwall Corp.*, 477 F. Supp. 975 (D.N.J. 1979).

One might say that copyright permits oligopoly profits while a patent allows monopoly returns.

The trademark system should serve as a model for policing the protections from the other systems, particularly copyright. Under trademark law, a mark will not be protected if protection could result in inappropriate profits. Likewise, copyright protection should not be enforced if it might permit the holder to enjoy the benefits of monopoly status; for example, when an idea may only be suitably expressed for consumer purposes in one way.⁹³ Furthermore, under trademark law, protection previously conferred under the law will be removed if protection comes to permit the holder to reap inappropriate returns. Similarly, copyright protections which may validly have attached to works at one time should not be recognized whenever a copyright results in monopoly power. In other words, a copyright should no longer protect a feature if potential customers come to consider only one possible expression of that feature as being able to meet their needs. As with trademarks, it should be irrelevant whether the monopoly status is achieved from an aggressive marketing scheme or simply from the vagaries of consumer demand.

This software genericism doctrine would make the application of copyright law consistent with the basic objectives and philosophies of copyright protection. More importantly, the doctrine could have dramatic, and fundamentally beneficial, effects upon the software market. Developers would have ample incentive to develop novel and more improved techniques, yet potential entrants to mature program markets would not be precluded. As a result, the initial entrants would be encouraged to keep their technological lead, while consumers willing to settle for established features would be able to enjoy commodity-like competition.

93. The extension of the analogy to patent would require a loss of patent protection only when the holder enjoyed a profit level that exceeds monopoly profits. This, by definition, will never occur. On the other hand, and consistent with the analogy, the antitrust doctrine of patent misuse does require the monopolist to grant competitors access to essential facilities within the monopolist's control. See, e.g., *MCI Communications Corp. v. AT&T Co.*, 708 F.2d 1081 (7th Cir. 1983), *cert. denied*, 104 S. Ct. 234 (1983).

COMMENTS

COURT-APPOINTED SCIENTIFIC EXPERT WITNESSES: UNFETTERING EXPERTISE

BY PAMELA LOUISE JOHNSTON †

INTRODUCTION

"Shopping"¹ for a scientific expert² is relatively easy. A lawyer searching for an expert looks not only for a qualified person, but for an expert who can and will support his or her client's position. The lawyer tests to see if the prospective expert's views are "correct" and discards those experts with "incorrect" views.³ This selection of viewpoint occurs because the lawyer is an advocate—one who pleads the cause of another.⁴ This manipulation adds another layer of strategy that successful trial attorneys can "mold" to their advantage.⁵ However, while easy to do, expert shopping and the subsequent "battle of the experts" introduces significant costs into the adversary system.⁶

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1. Van Dusen, *A United States District Judge's View of the Impartial Medical Expert System*, 32 F.R.D. 498, 500 (1962).

2. The type of expert I focus on is the scientific expert, for example, a physicist testifying in a nuclear energy case, a biochemist consulting in a genetic engineering case, or a computer specialist testifying in a microcode patent infringement dispute. I focus on scientific experts, whose opinions rest mainly on objective components, because their opinions are often sought in important cases. See *infra* notes 22-25 and accompanying text.

3. Van Dusen, *supra* note 1, at 499.

4. The word "advocate" comes from the latin root "advocatus," meaning "to summon, call to one's aid," and is related to the latin word "vocare," which means "to call." WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 32 (P. Grove ed. 1981).

5. See Foster, *Expert Testimony, —Prevalent Complaints and Proposed Remedies*, 11 HARV. L. REV. 169 (1897) (recounting anecdote of lawyer who said there are three kinds of liars: "the common liar, the d-d liar, and the scientific expert"); Gerber, *Victory vs. Truth: The Adversary System and its Ethics*, 19 ARIZ. ST. L.J. 3, 11 (1987) (lawyers prefer partisan to objective experts and commonly refer to partisan experts as "whores"); Langbein, *The German Advantage in Civil Procedure*, 52 U. CHI. L. REV. 823, 835 (1985) (noting that lawyers sometimes call experts "saxophones"—the lawyer calls the tune and the expert plays accordingly); Sink, *The Unused Power of a Federal Judge to Call His Own Expert Witness*, 29 S. CAL. L. REV. 195, 197 (1956) (noting extensive shopping for experts in an attempt to find the most favorable witness); cf. *In re Air Crash Disaster at New Orleans, Louisiana*, 795 F.2d 1230, 1233 (5th Cir. 1986) (suggesting trial judge should insist that experts offer more to the factfinder than couching the attorney's argument in the language of expertise).

6. See Van Dusen, *supra* note 1, at 500 (partisan selection and use of experts leads to often unconscious bias in testimony).

Although our adversarial trial system⁷ is not regarded as a highly efficient truth-seeking enterprise,⁸ one of its functions is nevertheless to uncover the truth that is entwined in a dispute.⁹ Scientific experts are used in the search for truth in many cases where the costs of inaccurate decisions may include frustrating technological innovation,¹⁰ imposing large economic burdens on corporations to comply with overly strict safety standards, or exposing individuals to life-threatening conditions. Take for example, a utility company's proposal to build a nuclear power plant in California. For economic, political, and strategic reasons, the company chooses a site that is near an active earthquake fault. A suit to block the project would raise the issues of safety, cost, and the growing need for power, requiring a court to consider complex scientific factors.¹¹ Geologists who specialize in earthquakes, structural engineers who understand steel and concrete stresses, and nuclear engineers who understand radioactive materials would necessarily be consulted for their opinions by attorneys for both sides. Overly optimistic predictions could allow an unsafe project to go forward, possibly with disastrous results. Yet overestimating the risks involved could make a project too expensive because of excessive safety precautions. Abandoning a project because of overestimating safety risks would involve its own costs.¹²

7. "[A] common law trial is and always should be an adversary proceeding." *Hickman v. Taylor*, 329 U.S. 495, 516 (1947).

8. Gerber, *supra* note 5, at 4; see also J. FRANK, COURTS ON TRIAL: MYTH AND REALITY IN AMERICAN JUSTICE 86 (1949) (inadvertent witness coaching); Frankel, 123 UNIV. PA. L. REV. 1031, 1038 (1975) (adversary system limits development of the truth); Swift, *Abolishing the Hearsay Rule*, 75 CALIF. L. (REV. 495, 518 (1987) (hearsay rule excludes relevant, non-prejudicial evidence).

9. For example, one of the goals of the Federal Rules of Evidence is "the promotion of [the] growth and development of the law of evidence to the end that the truth may be ascertained and proceedings justly determined." FED. R. EVID. 102; see Fuller, *The Forms and Limits of Adjudication*, 92 HARV. L. REV. 353, 382-85 (1978) (adversary system promotes impartial judgment by combating human tendency to prejudice situations according to familiar patterns).

However, truth is not the only goal of the Federal Rules of Evidence. Others include the growth of the law, "fairness in administration [of the rules]," and "elimination of unjustifiable expense and delay." FED. R. EVID. 102. Professor Hazard makes the observation that an advocate is not specifically concerned with the truth: "The morality of a seriously moral person includes concern for the truth of the matter in things of consequence. The advocate, however, must be concerned with presentation to others of evidence that will be taken as the equivalent of truth." Hazard, *Book Review*, 95 YALE L.J. 1523, 1527 (1986) (reviewing K. MANN, *QUIS CUSTODIET IPSOS CUSTODES? DEFENDING WHITE COLLAR CRIME* (1985)). A necessary implication of the advocate's role as presenter of "the equivalent of truth" is that our adversary system also cherishes values other than truth. But this debate over how central a value truth-seeking is to the adversary system is largely philosophical and thus has little impact on the actual practice of law. While disagreeing about whether truth-seeking is the primary function of the system, most people do agree that it is a function of the system. See Sink, *supra* note 5, at 197.

10. For example, uninformed decisions denying patent protection may lead inventors to resort to trade secret protection of their inventions. This lack of disclosure may hamper technological innovation. See, e.g., Paepke, *An Economic Interpretation of the Misappropriation Doctrine: Common Law Protection for Investments in Innovation*, 2 HIGH TECH. L.J. 55, 62 (1987).

11. See, e.g., *San Luis Obispo Mothers for Peace v. United States Nuclear Regulatory Comm'n*, 799 F.2d 1268 (9th Cir. 1986) (examining the difference between projected free-standing rather than bolted-down storage of spent nuclear fuel rods for determining what constitutes a significant hazard). See *infra* note 51 and accompanying text for more information about the issue of fuel rod storage.

12. Such costs could include, for example, a lack of future energy supplies, overdependence on foreign fuel, and a consequent national security risk. See generally SENATE COMM. ON ENERGY AND NATURAL RESOURCES, 96TH CONG., 1ST SESS. ENERGY INITIATIVES OF THE 95TH CONGRESS 1 (Comm.

Thus, if the truth-seeking process is not accurate, the legal system risks hindering or misdirecting economic and technological development.¹³ Just as disregarding scientific evidence completely can have these dangers, so can the current practice of expert shopping which results in each side presenting one-sided expert testimony in court.¹⁴ This practice introduces inaccuracy into the truth-seeking process, corrupting the legal system.

Three costs are apparent from the corruption caused by one-sided expert testimony. First, each time an incompetent, under-qualified or seriously biased expert testifies before a factfinder, the legal system loses credibility as a truthfinder. Second, when such an expert testifies, the factfinder becomes more cynical about the value of "expert" testimony. In cases where an accurate result depends upon the factfinder genuinely understanding expert testimony, truth is not found and justice not served if the factfinder, because of cynicism, ignores the expert's testimony.¹⁵

The third cost of expert shopping and the battle of the experts is the greatest, and therefore the focus of this Comment. Factfinders use expert testimony to gain an understanding of information that they would not understand from ordinary experience.¹⁶ Unfortunately, the great cost of the current adversarial use of scientific experts is that the process itself eliminates these experts' expertise.¹⁷ Under the current system an expert rarely acts as an "expert."¹⁸ Instead, the system reduces him or her to something closer to a mere "competent" person.¹⁹ In other words, the scientific expert whose role it is to assist the factfinder no longer acts like an expert. The loss of expertise is not a loss of *degree* of expertise; instead, it is an elimination of expertise, resulting in a change in the *quality* of information available to the factfinder. Having "competent" people, rather than experts, testify degrades the level of scientific analysis presented in court, therefore impeding the truth-seeking function of the court. The importance of expert testimony is not merely an academic one; scientific evidence and the experts who must explain it are increasingly important in

Print 1979) (estimating decline to near exhaustion of U.S. production of oil and gas by end of the century and increasing dependence on foreign fuel supply).

13. See Paepke, *supra* note 10, 85-88 (discussing the problems involved with improper decisions on patent protection).

14. See *infra* text accompanying notes 93-114 (discussing the problems with the current treatment of scientific experts in federal court).

15. Cf. Imwinkelried, *The Standard for Admitting Scientific Evidence: A Critique from the Perspective of Juror Psychology*, 28 VILL. L. REV. 554, 567-68, 569-70 (1982-83) (jurors are not unduly influenced by scientific evidence and may disregard it; jurors may reject evidence of which they are skeptical).

16. See FED. R. EVID. 702.

17. See *infra* text accompanying notes 94-110 (explaining why the current system forces expert witnesses to lose the characteristics which makes them experts).

18. *Id.*

19. See *infra* text accompanying notes 99-108 (discussing competence). Potential scientific experts are disinclined to testify, because the system reduces their expertise. This consequently increases the first two costs (truth and cynicism). The reluctance of many reputable experts to involve themselves in litigation was a major concern of the Advisory Committee that drafted Rule 706's comprehensive scheme for court-appointed experts. See FED. R. EVID. 706 advisory committee's note. See also Van Dusen, *supra* note 1, at 508-09 (highly qualified experts unwilling to participate in cases as partisans).

proving or disproving cases.²⁰ For example, in patent infringement cases, experts testify concerning the degree of "non-obviousness" of the invention.²¹ For the patent system to operate properly, a testifying expert must possess a high level of skill and familiarity with the subject matter of the patent and of industry capabilities. A factfinder deciding whether to grant monopoly power in a highly competitive marketplace relies on accuracy and sophistication from the expert. Simplification of evidence that results from having only "competent" witnesses dilutes and distorts the complexities of a situation, with large costs to the legal system and society in general.

Accordingly, the goal of this Comment is twofold: First, to present a model for defining "expertise" which will enable us to understand what expertise is and more accurately analyze what effect trial procedures can have on it; and second, based on that model to propose changes for the way courts use scientific expert witnesses. This Comment is concerned primarily with the witness whose scientific expertise largely involves objective criteria.²² For example, a physician explaining how the kidneys purify the blood would be a scientific expert for my purposes. However, under my definition, a physician who offers her opinion on the cause of a patient's condition would not be a scientific expert, because a diagnosis requires consideration of too many subjective factors. Similarly, a psychiatrist who testifies concerning the psychological motivations or the dangerousness of a criminal defendant also does not base his opinion primarily upon objective factors.²³ No verifiable experiments can be run to test a

20. The National Center for State Courts has found that almost half of the judges and attorneys they surveyed encountered scientific evidence in at least 30% of their cases. *Study to Investigate Use of Scientific Evidence*, NAT'L CENTER FOR ST. CT[S]. REP., Aug. 1980 at 1. For a description of expert testimony available to a prosecuting attorney see Blair, *Scientific Evidence*, in *THE PROSECUTOR'S DESKBOOK* 555 (P. Healy & J. Manak eds. 1977). For a thorough explanation of the importance of scientific evidence in modern trials see Imwinkelried, *supra* note 15, at 555-600.

21. See generally 35 U.S.C. § 103 (1982) (non-obviousness required for patent validity).

22. There is a debate in the philosophy of science focusing upon whether science is grounded in objective fact or is really a mixture of subjective and objective elements. Lakatos, *Falsification and the Methodology of Scientific Research Programmes*, in *CRITICISM AND THE GROWTH OF KNOWLEDGE* 91 (I. Lakatos & A. Musgrave, eds 1965). Thomas Kuhn, recognized as the initiator of the subjective view of science, argues that scientific discoveries are dependent more on the current scientific community's common beliefs than on any objective process of investigation. See generally T. KUHN, *STRUCTURE OF SCIENTIFIC REVOLUTIONS* (1970); cf. P. FEYERABEND, *AGAINST METHOD* (1975) (anarchistic view of science). The strongest critics of the subjective view argue that science cannot be reduced to a product of "mob psychology." Lakatos, *supra* at 178; cf. Shapere, *Meaning and Scientific Change*, in *MIND AND COSMOS ESSAYS IN CONTEMPORARY SCIENCE AND PHILOSOPHY* (R.G. Colodny ed. 1983) (criticizing the subjective view). While I recognize that this realist movement to debunk the objective nature of science contains some truth, I am not convinced by it. It is nonetheless useful always to keep in mind Kuhn's notions so that one can reflect upon the way subjective influences may predetermine "objective" findings. Cf. Jones, *Is There a Property Interest in Scientific Research Data?*, 1 HIGH TECH. L.J. 447, 464-65 (1986) (scientists' world view influences what she deems facts).

23. See generally Wesson, *Historical Truth, Narrative Truth, and Expert Testimony*, 60 WASH. L. REV. 331 (1985) (casting doubt on ability of psychoanalysis to determine a criminal defendant's mental state in the past recollection of events).

Best guesses and probabilities are all that one can expect of a psychiatrist when making a diagnosis. The United States Supreme Court ruled that a psychiatrist's testimony predicting dangerousness was admissible despite the scientific dubiousness of the prediction. *Barefoot v. Estelle*, 463 U.S. 880, 896-903 (1983). Justice Blackmun made a strong argument for the exclusion of this evidence based upon its unreliability. *Id.* at 926-30 (Blackmun, J., dissenting). See also Levine, *The*

psychiatrist's hypothesis. The actual number of experts who fall into this narrower-than-Rule 702 definition probably is few.²⁴ But even if the scope of this Comment is narrow, the particular situations it covers are significant.²⁵

To accomplish its twofold goal, this Comment has four sections. Section I examines expertise. Section II looks at the current treatment of expert witnesses in the federal system. Section III analyzes the problems that the current system presents in relation to expertise. Section IV makes two proposals, one legislative and one judicial, in order to solve the problems raised in Section III.

I. EXPERTISE

This Comment examines expertise as a type of discretion.²⁶ When a person exercises her expertise concerning a subject, she makes a decision based upon her expert judgment. The attributes of expertise are education,²⁷ autonomy,²⁸ experience, and intuitive understanding.²⁹ If any of these attributes are

Adversary Process and Social Science in the Courts: Barefoot v. Estelle, 12 J. PSYCHIATRY & L. 147 (1984) (analyzing the unreliability of psychiatric testimony).

24. This assertion is not based on any empirical studies, but rather upon my own impressions from reading many of the cases which involved Rule 702 experts.

For example, in an examination of the 38 Ninth Circuit cases listed in 5 Shephard's United States Citations (1986) for FED. R. EVID. 702, only 3 cases involved scientific experts as defined in this Comment: *United States v. Horo-Espinosa*, 619 F.2d 789 (9th Cir. 1979) (expert on cocaine); *Crom Corp. v. Crom*, 677 F.2d 48 (9th Cir. 1982) (expert on water tanks); *Wood v. Stihl, Inc.*, 705 F.2d 1101 (9th Cir. 1983) (engineer testified on chain brake design and use). However, what is relevant is not the number of cases in which scientific experts are used, but rather the importance of the issues and the decisions in those cases. See *supra* note 12 and accompanying text.

25. See *supra* note 20 (data on the use of scientific evidence indicating the likelihood of the importance of scientific experts).

26. Expertise is one of four types of discretion: discretion vis-a-vis the rule of law, management by objectives, a range of choice, and expertise. I derive the general framework of these four types of discretion from a seminar entitled "Discretion", taught by Professors Robert Post, Martin Shapiro, and Edward Rubin at Boalt Hall, University of California at Berkeley (January 1986 to May 1986). However, neither errors in my logic or my specific model of the expertise of a scientific expert should be imputed to these professors. Since this Comment is not about the whole field of discretion, I mention the four types only to give perspective as to where expertise fits into the complete framework of discretion.

Discretion (vis-rule) and the rule of law exist in tension, along a linear spectrum. At one end of the continuum, quasi-precise rules exist in the realm of the rule of law. At the other end, open-ended discretion operates in an unfettered manner. All laws exist along the continuum. The term "rule of law" is meant to designate a rigid rule, stated in unambiguous language, which will produce precisely the same result each time it is applied. One of the chief reasons that lawmakers insist on rigid rules is to insure certainty. Friendly, *Indiscretion About Discretion*, 31 EMORY L.J. 747, 755 (1982).

Management by objectives defines, in part, the relationship between the manager and the worker and operates as follows. A manager describes to his worker a desired result but does not prescribe the process to be used to obtain the result. Instead, the worker internalizes the objective and has "discretion" to choose the path that he believes is best suited to reach that objective. See Swanson, *A Basis of Authority and Identity in Post Industrial Society*, in *IDENTITY AND AUTHORITY* 194-95 (R. Robertson & B. Holzner, eds. 1980).

Like management by objectives, range of choice operates as a means of control. Range of choice, however, focuses not on the stated objective, but rather on the lower level decision-maker and particularly on the process which she uses to choose a path that she will follow. An analysis of range of choice is an internal viewpoint consideration of the worker's self perceived ability and freedom to choose from available options.

27. W.E. MOORE, *THE PROFESSIONS: ROLES AND RULES*, 10-13 (1970).

28. *Id.* at 15-16.

missing, expertise will not be present.³⁰ Commentators have traditionally described a person who possesses these characteristics as a professional.³¹ A functional analysis of what the "professional" and a "profession" is results in the realization that the classic professional is what this Comment calls an "expert."

The standard approach to defining a profession is in terms of its ideal, typical, or quintessential characteristics, those which distinguish it from a mere occupation.³² Moore identifies the defining characteristics of a profession as occupation, calling, organization, education, service orientation, and autonomy.³³

Moore's concept of professionalism is based upon a model in which one abstracts the central elements from the "true" or classical professions of law, medicine, and the clergy.³⁴ These classic professionals were the "learned," who studied and passed along theoretical knowledge.³⁵ Because they were "learned," they were given autonomy.³⁶

With the explosive growth in both the number and importance of scientific pursuits, a new group of the "learned" has developed—scientists, engineers, and others. These "experts" share certain characteristics with the classic professionals: they learn a body of theoretical knowledge; they are given autonomy; and hierarchical organizations have grown up about their practice which similarly include barriers to entry into that pursuit. However, the classic professional elements of calling and service orientation have disappeared in most cases. Thus, my model of a scientific expert incorporates the components of a

29. See *infra* notes 54-56 and accompanying text (explaining intuitive understanding).

30. The Dreyfus brothers' controversial model of human reasoning dovetails with this Comment's view of expertise in many significant ways. H.L. DREYFUS & S.E. DREYFUS, *MIND OVER MACHINE, THE POWER OF HUMAN INTUITION AND EXPERTISE IN THE ERA OF THE COMPUTER* (1986). This theory, which attacks the notion that intelligent human reasoning can be duplicated, contradicts the model of human reasoning accepted by some designers of expert systems, who view this process as being duplicable by an expert system. See, e.g., F. Hayes-Roth, D.A. Waterman & D.B. Lenat, *An Overview of Expert Systems*, in *BUILDING EXPERT SYSTEMS* 3, 12-13 (F. Hayes-Roth, D. A. Waterman & Lenat, eds. 1983) [hereinafter *BUILDING EXPERT SYSTEMS*]; R.J. Brachman, S. Amarel, C. Engelman, R.S. Englemore, E.A. Feigenbaum & D.E. Wilkins, *What Are Expert Systems?* 31, 41-45 in *BUILDING EXPERT SYSTEMS; Applications-Oriented AI Research: Science*, 80-81 in *II THE HANDBOOK ON ARTIFICIAL INTELLIGENCE* (A. Barr & E.A. Feigenbaum, eds. 1982); see also Debessonnet & Cross, *An Artificial Intelligence Application in the Law: CCLIPS, A Computer Program that Processes Legal Information*, 1 *HIGH TECH. L.J.* 329, 329-30 (1986).

31. See generally W.E. MOORE, *supra* note 27 (focusing on the classical professions); T.J. JOHNSON, *PROFESSIONS AND POWER* (1972) (focusing on the power dynamic of professions).

32. See, e.g., W.E. MOORE, *supra* note 27, at 4-5 (1970).

33. *Id.* at 5-6.

34. This approach, which uses profession "trait" or specific "function" analyses, has been criticized as ignoring the power asserted by the professions and the historical conditions which produced them. T.J. JOHNSON, *supra* note 31, at 37-38.

While I appreciate Johnson's point, I do not find his analysis useful in the context in which I wish to discuss professionalism. Because of my focus on discretion, a functional analysis is most useful, because we can see what happens when outside forces, such as methods of examining witnesses, interact with an expert/professional. See W.E. MOORE, *supra* note 27, at 10.

35. *Id.*

36. *Id.* at 15-16 (autonomy of professionals based in part on education); cf. BLEDSSTEIN, *THE CULTURE OF PROFESSIONALISM* 89-90 (1976) (autonomy of professionals based on training and indoctrination).

body of theoretical knowledge and autonomy as described in the literature on professions.

To illustrate what I mean by expertise, let me use an example familiar to the layperson, not just the scientific expert. Consider the concert pianist playing a piano concerto. He has learned either through years of school or personal tutoring about technique, music history and theory. His *education* provides the foundation for his playing. This pianist also has the *autonomy*, or self-direction, to direct how he will play a piece. If a conductor treats a pianist as a puppet, the pianist loses a part of his ability to play to his highest potential. *Experience* also is important to the pianist. To grow, he needs experience to point out both his faults and his successes. But most important, a concert pianist needs inspiration. This term encompasses both natural ability³⁷ and *intuitive understanding* of the meaning to be conveyed by the piece.

Similarly, consider the long-tenured geology professor who studies earthquakes. Years of education led to his graduate degree. Freedom to pursue his interests (autonomy) and many years in the field (experience) also helped create this expert, the earthquake specialist. But it is the last component of expertise which separates this expert from a merely competent geologist—intuitive understanding. This understanding involves more than just his technical knowledge about earthquakes. Although nearly impossible to describe, it is the geologist's ability to understand new situations in a manner which appears to go beyond his current level of scientific knowledge.

A. The Elements of Expertise

As just briefly discussed, the elements of my model of expertise are education, autonomy, experience, and intuitive understanding. As noted, this model draws from the professionalization literature,³⁸ and dovetails in some respects with the model of expert judgment put forward by some researchers working in the area of computer expert systems.³⁹ This section will expand on the elements of my model of expertise.

1. Education

The necessity of education is obvious if the community expects an expert to exercise independent judgment. But years of schooling are not enough. An expert needs to learn specialized knowledge that is "organized into an internally consistent system, called a *body of theory*."⁴⁰

37. I do not discuss further the natural ability of an expert because it remains a constant, unaffected by the manner in which the expert is used in court.

38. See *supra* notes 27-36 (citing materials on professionalization).

39. See *supra* note 30 (surveying works discussing developments in expert systems).

40. Greenwood, *Social Work*, in PROFESSIONALIZATION 10, 11 (H.M. Vollmer & D.L. Mills eds. 1966) (emphasis original). Greenwood states that:

[a] profession's underlying body of theory is a system of abstract propositions that describe in general terms the classes of phenomena comprising the profession's focus of interest. Theory serves as a base in terms of which the professional rationalizes his operations in concrete situations. Acquisition of the professional skill requires a prior or simultaneous mastery of the theory underlying that skill. Preparation for a profession, therefore, involves considerable preoccupation with systematic theory, a feature virtually absent in the training of the nonprofessional.

The expert's education involves more than rote memorization; she must master and understand the intricacies of the specialized knowledge and underlying theory of her chosen field.⁴¹ This knowledge and theoretical understanding form the foundation of the expert's discretion. It is upon this foundation that the other attributes rest, for without a consistent theory of the subject, new information and freedom of thought create no new advances and deepening of understanding. But with only this theoretical knowledge, the person is not an expert. Expertise is more than detached understanding or mechanical application of rules.⁴²

2. *Autonomy*

An expert's education provides him with a highly valued commodity in our society: autonomy.⁴³ The inability of the laity to comprehend the theoretical framework of an expert's decision is not the only reason for this autonomy. In addition, an essential element in the practice of a profession "is the exercise of the faculty of judgment, and its exercise, moreover, in circumstances where the validity of the judgment must be a matter of opinion."⁴⁴

In other words, autonomy creates room for the expert to exercise his independent intellect and intuitive understanding. In this zone of autonomy, the expert exercises his discretion in accordance with his soundest judgment. We demand not step-by-step analysis from an expert, but a decision based upon a solid foundation of knowledge aligned with the professional's best judgment.⁴⁵

Another element of autonomy is the freedom from outside control. Non-experts may nonetheless question an expert's decision. Questioning, like experience, plays an important role in testing and shaping the expert's assumptions and results. But being able to test the expert is not the same as controlling the expert.⁴⁶ For an expert to act intuitively, he needs room to be able to think

Id.

41. In a seminal work, Carr-Saunders and Wilson found that "[w]ith the advancement of knowledge and the raising of standards, the content of the courses of theoretical training has greatly increased." A.M. CARR-SAUNDERS & P.A. WILSON, *THE PROFESSIONS* 375 (1933) (claiming that increased body of knowledge, more than any other cause, "has led to the breakdown of the apprenticeship system under which both theoretical and practical training was supposed to be given").

42. Such characteristics are descriptive of either a novice, an advanced beginner, or a competent, but not an expert. See H.L. DREYFUS & S.E. (DREYFUS, *supra* note 30, at 19-27.

43. W.E. MOORE, *supra* note 27, at 15-16. As a society, we accord our experts much discretion in their chosen fields: "[t]he specialist in his field must be supreme, for who, other than another similarly qualified specialist, can challenge him?" *Id.* Education acts as the threshold to autonomy, which is the ultimate value for members of the professional community. See *id.* at 16. This is what Johnson was concerned with when he described the connection between the professions and power. See T.J. JOHNSON, *supra* note 31, at 41-45.

44. A.M. CARR-SAUNDERS & P.A. WILSON, *supra* note 41, at 399. This element specifically applies to the classic professions, such as law and medicine. *Id.*

45. For example, when I go to the doctor with a sore throat, I want to know that my doctor went to a proper medical school to learn all about sore throats. But if that were all I wanted, I could consult any type of doctor. I go to my doctor because I trust she has seen lots of sore throats in the past, reads all the latest journal articles about sore throats, and makes independent judgments about the cause of a particular sore throat. I want her to have these attributes because I want her to exercise her best judgment to help me. I want her to be an autonomous evaluator.

46. See H.L. DREYFUS & S.E. DREYFUS, *supra* note 30, at 36.

freely, without external restrictions. Restricting him transforms him from an intuitive expert into someone lower in skill such as a competent or a proficient person. A competent person consciously *chooses* an objective procedure to apply to a set of facts and then works through the facts using the process chosen.⁴⁷ One step above the competent, a proficient person does not act in a conscious, deliberative, rule-applying manner.⁴⁸ "The proficient performer, while intuitively organizing and understanding his task, will still find himself thinking analytically about what to do."⁴⁹

Reducing the expert to a lower level by restricting his autonomy can be useful for some purposes. For instance, if a person wants a great tennis player to explain how to hit a low ground stroke, the value of having the professional tennis player slow down the process and reflect upon his actions outweighs the loss of expertise during the strokes he hits. In such situations, the value of teaching outweighs the loss of expertise.

When time is plentiful and much turns on the expert's opinion, as during a technology-based lawsuit, "detached deliberative rationality . . . can enhance the performance of even the intuitive expert."⁵⁰ However, the usual type of "deliberation" caused by trial tactics, which simply means slowing down the expert and forcing him to *justify* his results, can do more harm to the expertise sought to be imparted than the benefit to the factfinder which results from simplification.

For example, in a recent case, a structural engineer was called upon to testify about the problem of stabilizing spent fuel rods in a storage tank at a nuclear power plant.⁵¹ Such a case presents problems which a judge or a jury cannot adequately solve without an expert's help. Permitting the testifying engineer to think freely and creatively is essential in achieving a safe, workable, cost-effective solution to the problem of the increased, long-term need for storage of radioactive waste. The step-by-step analysis of the problem that an undergraduate structural engineer (a proficient witness) could do would not address all the variables that confront the expert engineer faced with this problem. Similarly, a step-by-step analysis elicited from the true expert on structural engineering falls short of eliciting that expert's total understanding of the problem. This is because the step-by-step analysis omits intuitive thinking, which in turn sacrifices truth as understood by a scientific expert.

This is too high a price. Our legal system, which is essentially a method of dispute resolution, should permit scientific experts to offer their complete expertise. Autonomy should be a component of the expert who testifies in a case.

47. *Id.* at 26.

48. *Id.* at 29.

49. *Id.*

50. *Id.* at 40.

51. *Mothers For Peace v. United States Nuclear Regulatory Comm'n*, 799 F.2d 1268 (9th Cir. 1986). In this case, a nuclear power plant operator planned to store spent fuel rods without externally securing them to the floor or walls of the storage container. *Id.* at 1269. Plaintiff sought to block this action. *Id.* On review, the court remanded the case to the Nuclear Regulatory Commission so that it could consider the hazards of bolted-down versus free-standing storage of spent fuel rods. *Id.* at 1271.

3. *Experience*

Experience buttresses the education and autonomy of the expert. Education provides authority, and autonomy provides the freedom to exercise that authority. Experience, the third component of expertise, substantiates and refines the professional's judgment, increasing his authority. Experience facilitates the application of theoretical knowledge beyond the person's previous grasp. More importantly, experience can refine a person's judgment providing feedback⁵² to test a theoretical concept.

Einstein's description of how he achieved his insights captures the role of experience in expertise. Einstein stated: "To these elementary laws there leads no logical path, but only intuition, supported by being sympathetically in touch with experience."⁵³ Experience in turn supports or buttresses the other components of expertise. Folk wisdom tells us that we mature when we "learn from our mistakes." Whether one calls the process a feedback loop or learning from experience, it is the same process. Experience comes from opportunities to test one's own assumptions, see new insights, and confirm ideas through application to practical situations.

4. *Intuitive Understanding*

The final component of this model is intuitive understanding. The mind of an expert has been characterized as an experience base consisting of "[a]n immense library of distinguishable situations."⁵⁴ However, the expert also exercises what has been termed "holistic similarity recognition."⁵⁵ This is the intuitive ability to solve problems based upon the expert's knowledge and experience without first reducing the problem into its component parts and pursuing a logical analysis. In other words, this irreducible concept describes the "gut-level" understanding that distinguishes a true expert from a competent or proficient person. This is the component that makes the expert's understanding greater than the sum of the parts of information available to him. It is this last component that this Comment is trying to unfetter for use in the legal dispute process.

B. The Exercise of Expertise

The four attributes of my model—education, autonomy, experience, and intuitive understanding—combine to create the expertise for which we consult experts. We rely on this form of discretion—expertise—whenever we defer to an expert.⁵⁶ Without such deference, no expert could successfully function as an expert.⁵⁷ The actual process of applying expertise to a problem is an

52. Feedback is the return of ideas "in an altered or extended form to their point of origin, so making possible still more progress." A.P. COWIE & R. MACKIN, OXFORD DICTIONARY OF CURRENT IDIOMATIC ENGLISH 103 (1975).

53. G. HOLTONE, THEMATIC ORIGINS OF SCIENTIFIC THOUGHT: KEPLER TO EINSTEIN 357 (1973).

54. H.L. DREYFUS & S.E. DREYFUS, *supra* note 30, at 32.

55. *Id.* at 28.

56. *See supra* note 26 for a description of other forms of discretion.

57. *See infra* text accompanying notes 93-114 (explaining how the current system causes loss of expertise).

unquantifiable independent merging of the expert's past experience, intuitive judgment, and theoretical understanding in a singular moment of insight.⁵⁸ When the expert acts upon his insight he exercises expertise.

This higher level of thinking is different in quality from that used by persons with lesser levels of ability such as novices, advanced beginners, competent, and proficient.⁵⁹ However, often lay people do not like a true expert to function on such a level because they cannot control the discussion. No matter how intelligent the lay person is, that person simply cannot separate the expert's thinking into its component parts, because the whole of the expert's expertise is greater than the sum of its parts. When a discussion progresses at the level of expertise, the component parts are often indiscernible. A lay person's need to control the discussion conflicts with his or her need to trust the expert to decide a question which requires expertise to answer. In a judicial setting, this conflict between the need for trust and the desire for control is particularly acute.

II. CURRENT TREATMENT OF EXPERTS IN FEDERAL COURT

The courtroom is one of the most important places where expertise comes in contact with real scientific problems. Once a trial court determines that proffered scientific evidence is admissible⁶⁰ and that an expert is necessary, there are two procedures by which an expert may testify. Under Rule 702, judges allow parties to present their own expert testimony.⁶¹ Rule 706 allows

58. For example, when the talented automobile mechanic listens to my engine, questions me about the starting behavior of my car and looks intently into the recesses of my engine, in an instant he correctly identifies the problem as a worn coil. All the components of expertise—education, autonomy, experience, and intuitive understanding—combine in the moment he diagnoses the trouble.

59. See *supra* notes 47-48; H.L. DREYFUS & S.E. DREYFUS, *supra* note 30, at 21.

60. Rule 702 states: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." FED. R. EVID. 702.

Prior to adoption of the Federal Rules of Evidence in 1975, the Court of Appeals for the District of Columbia, in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), set a standard which other courts later followed governing the admissibility of scientific evidence. It stated that the party seeking to introduce scientific evidence must show that the scientific principle upon which the evidence rests "be sufficiently established to have gained general acceptance in the particular field in which it belongs." *Id.* at 1014.

After the passage of the Federal Rules of Evidence, a general state of upheaval enveloped the *Frye* test, with many courts wisely breaking away from the strict *Frye* approach. See, e.g., *States v. Dowling*, 753 F.2d 1224, 1237 (3d Cir. 1985) (rejecting the *Frye* test); *United States v. Williams*, 583 F.2d 1194, 1198-99 (2d Cir. 1976) (rejecting the *Frye* test), *cert. denied*, 439 U.S. 1117 (1979). The broader approach of the Federal Rules is the current trend, although the *Frye* rule has not been completely abandoned. See Gianelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half Century Later*, 80 COLUM. L. REV. 1197, 1228-31 (1980).

Frye erected an extra hurdle for the admission of scientific evidence. With the safeguards of the Federal Rules and my proposal, I believe the *Frye* approach is unnecessary. At least two current members of the United States Supreme Court, Justices White and Brennan, would like to resolve the issue of whether *Frye* was overruled by the enactment of the Federal Rules of Evidence. *Mustafa v. United States*, 22 M.J. 165 (C.M.A. 1986), *cert. denied*, 107 S.Ct. 444, 444-45 (1986) (White & Brennan, J., dissenting).

61. FED. R. EVID. 702.

the court to appoint an expert witness agreed to by the parties or experts of its own choosing.⁶²

A. Rule 702 Party-Sponsored Experts

Nearly all experts testify in a trial at the request of one of the parties as authorized by Rule 702. This Comment refers to such an expert as a "party-sponsored expert." Rule 702 permits an expert to testify about that expert's "scientific, technical, or other specialized knowledge" if the expert's testimony will "assist the trier of fact to understand the evidence or to determine a fact in issue[.]"⁶³ Thus, Rule 702 sets up two separate instances when an expert may testify. First, an expert may give a dissertation or exposition of the scientific principles relevant to the case to help educate the factfinder.⁶⁴ Second, an expert may testify to help the factfinder determine a fact in issue. The expert thus may testify in a manner similar to that of an ordinary witness, except that an expert may testify as to his opinion and may base his opinion upon inadmissible evidence.⁶⁵ However, if the expert's testimony merely reiterates knowledge or experience within the factfinder's reasonable scope of knowledge or experience,⁶⁶ then the expert's testimony would invade the province of the jury, and thus would not be allowed.⁶⁷

B. Rule 706 Court-Appointed Experts

In 1975, Congress extended the express right of a court to appoint expert witnesses to civil cases.⁶⁸ Rule 706 of the Federal Rules of Evidence states that a "court may appoint any expert witness agreed upon by the parties, and may appoint expert witnesses of its own selection."⁶⁹

62. FED. R. EVID. 706.

63. See *supra* note 60 (providing entire text of Rule 702).

64. FED. R. EVID. 702 advisory committee's notes.

65. FED. R. EVID. 703. However, the inadmissible evidence upon which the expert bases his opinion must be "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject." *Id.*

66. Rule 702 is broadly phrased to encompass experts not traditionally considered experts who possess specialized knowledge such as "bankers or landowners testifying to land values." *Soo Line R.R. Co. v. Fruehauf Corp.*, 547 F.2d 1365, 1377 (8th Cir. 1977); FED. R. EVID. 702 advisory committee's notes. Naturally, the party must qualify the person with specialized knowledge in the same way a party qualifies traditional experts: according to the person's "knowledge, skill, experience, training, or education." FED. R. EVID. 702.

67. See *Ellis v. Miller Oil Purchasing Co.*, 738 F.2d 269, 270 (8th Cir. 1984); *Bartak v. Bell-Galyardt & Wells, Inc.*, 629 F.2d 523, 530 (8th Cir. 1980); *United States v. Kyles*, 20 M.J. 571, 575 (N.M.C.M.R. 1985).

68. FED. R. EVID. 706. In 1946, Congress had initiated a comprehensive scheme to permit a trial court to appoint an impartial expert in a *criminal* trial. FED. R. CRIM. P. 28 (1946). In civil cases, a court prior to 1975 had the inherent ability to appoint an expert under proper circumstances to aid the court in a just resolution of the case. *Danville Tobacco Assn. v. Bryant-Buckner Assocs., Inc.*, 333 F.2d 202, 208-09 (4th Cir. 1964) (court appointed tobacco marketing expert in antitrust suit); *Scott v. Spanjer Bros., Inc.*, 298 F.2d 928, 930-31 (2d Cir. 1962) (medical expert appointed in personal injury loss); see generally Sink, *The Unused Power of a Federal Judge to Call His Own Expert Witnesses*, 29 S. CAL. L. REV. 195 (1956).

69. FED. R. EVID. 706. Rule 706 in its entirety reads:

(a) Appointment

The court may on its own motion or on the motion of any party enter an order to show cause why expert

Three concerns about the use of party-sponsored experts led the Advisory Committee to propose to the Supreme Court and ultimately to Congress the establishment of Rule 706's comprehensive system of permitting a trial court to appoint experts: "[t]he practice of shopping for experts, the venality of some experts, and the reluctance of many reputable experts to involve themselves in litigation."⁷⁰ In drafting the Federal Rules of Evidence, the Advisory Committee assumed that the threat of court-appointed experts would be enough to prevent these three problems with party-sponsored experts.⁷¹ The Advisory Committee's notes state that the "availability of the [court appointment] procedure [would] in itself decrease[] the need for resorting to it."⁷² However, the concerns that the Advisory Committee hoped to address with Rule 706 remain with us today as real problems.⁷³

Today, courts rarely exercise their power to appoint expert witnesses.⁷⁴ Some courts express the concern that utilizing court-appointed experts usurps the factfinder's role.⁷⁵ For example, in *Kian v. Mirro Aluminum Company*,⁷⁶ a Michigan district court noted in dicta that "[t]he presence of a court-sponsored

witnesses should not be appointed, and may request the parties to submit nominations. The court may appoint any expert witness agreed upon by the parties, and may appoint expert witnesses of its own selection. An expert witness shall not be appointed by the court unless the witness consents to act. A witness so appointed shall be informed of the witness' duties by the court in writing, a copy of which shall be filed with the clerk, or at a conference in which the parties shall have opportunity to participate. A witness so appointed shall advise the parties of the witness' findings, if any; the witness' deposition may be taken by any party; and the witness may be called to testify by the court or any party. The witness shall be subject to cross-examination by each party, including a party calling him as a witness.

(b) Compensation

Expert witnesses so appointed are entitled to reasonable compensation in whatever sum the court may allow. The compensation thus fixed is payable from funds which may be provided by law in criminal cases and civil actions and proceedings involving just compensation under the fifth amendment. In other civil actions and proceedings the compensation shall be paid by the parties in such proportion and at such time as the court directs, and thereafter charged in like manner as other costs.

(c) Disclosure of appointment

In the exercise of its discretion, the court may authorize disclosure to the jury of the fact that the court appointed the expert witness.

(d) Parties' experts of own selection

Nothing in this rule limits the parties in calling expert witnesses of their own selection.

FED. R. EVID. 706.

70. FED. R. EVID. 706 advisory committee's notes.

71. *Id.*

72. *Id.*

73. The touted benefits of using court-appointed experts have not materialized, because in practice, relatively few judges have exercised their Rule 706 privilege. 3 J. WEINSTEIN & M. BERGER, WEINSTEIN'S EVIDENCE ¶ 706[01] (1987).

74. AMERICAN BAR ASSOCIATION, SECTION OF LITIGATION, EMERGING PROBLEMS UNDER THE FEDERAL RULES OF EVIDENCE 157, 225-28 (1983); see also J. WEINSTEIN & M. BERGER, *supra* note 73, at ¶ 706[01] (asserting that federal judges have appointed experts in "remarkably few cases").

This is not to say that the power is never exercised. For example, the Fifth Circuit suggested that a court-appointed computer expert could help the district court resolve whether an agency's computer could be programmed to reduce delays in noticing providing notice of a hearing under the Aid to Families with Dependent Children program. *Barrett v. Roberts*, 551 F.2d 662, 664 (5th Cir. 1977).

A Federal Judicial Center study in progress on the use of court-appointed experts shows 80 of 500 judges, had used Rule 706 court-appointed experts. Telephone conversation with Joe Cecil, Federal Judicial Center (Jan. 20, 1988).

75. See J. WEINSTEIN & M. BERGER, *supra* note 73 at ¶ 706[09].

76. 88 F.R.D. 351 (E.D. Mich. 1980).

witness, who would most certainly create a strong, if not overwhelming, impression of 'impartiality' and 'objectivity,' could potentially transform a trial by jury into a trial by witness."⁷⁷

Thus, while some courts view neutral experts as potentially invading a jury's function, other courts view Rule 706 experts beneficially.⁷⁸ For example, in *Students of California School for the Blind v. Honig*, the Ninth Circuit affirmed the district court's use of a neutral court-appointed expert to determine whether reports concerning the building site satisfied earthquake safety rules.⁷⁹ The appellate court noted that the district court "was free to appoint an expert of its own choosing without the consent of either party."⁸⁰

Another possible explanation of why courts refrain from appointing experts is that the court is overly comfortable with the adversarial system's reliance on the parties' ability to produce "the truth."⁸¹ Old ways die slowly. A court in most situations prefers to rely on the parties;⁸² the notion that the court must interject itself into the proceedings as someone other than an umpire is quite foreign to the average trial judge.⁸³

C. Rule 611 and 614 Methods of Examination

Tradition and Rule 611(c) define the general method of examining a witness.⁸⁴ Questioning on direct examination proceeds one logical step at a time so as to allow objections by the opposing counsel.⁸⁵ On direct examination, counsel ordinarily is not allowed to ask leading questions, except to elicit foundational facts or lead a witness through a confusing area of examination.⁸⁶ On cross-examination, both open-ended and leading questions are allowed.⁸⁷ Usually, a court does not permit a witness to tell his story in narrative⁸⁸ or

77. *Id.* at 356. The court did not permit the expert to testify because "the issues [were] within the grasp of the jury." *Id.* The *Kian* court's holding concerned whether an expert should testify at all about the subject matter, a Rule 702 inquiry, although its dicta discussed whether a court-appointed expert would be proper, a Rule 706 inquiry. Thus, the court confused Rule 702 and Rule 706.

78. *See, e.g.,* *Gates v. United States*, 707 F.2d 1141 (10th Cir. 1983); *Wheeler v. Schumaker*, 78 F.R.D. 218, 227 n. 14 (D. R.I. 1978).

79. 736 F.2d 538, 549-50 (9th Cir. 1984), *vacated on other grounds*, 471 U.S. 148 (1985).

80. 736 F.2d at 549. Although the appointment of court experts is rare, when a district court does utilize Rule 706, a strict level of review could inhibit district courts from appointing their own experts for fear of reversal. Fortunately, the level of review that circuit courts apply is the abuse of discretion standard. *Id.*; *see also* *Fugitt v. Jones*, 549 F.2d 1001, 1006 (5th Cir. 1977).

81. Resnik, *Failing Faith: Adjudicatory Procedure in Decline*, 53 U. CHI. L. REV. 494, 513 (1986) [hereinafter *Failing Faith*].

82. *See* Resnik, *Managerial Judges*, 96 HARV. L. REV. 374, 376, 444-45 (1982).

83. *Id.* at 376; *see* Wyzanski, *A Trial Judge's Freedom and Responsibility*, 65 HARV. L. REV. 1281, 1302-04 (1952).

84. FED. R. EVID. 611(c).

85. *See generally* FED. R. EVID. 103(a)(1) & (2) (objections need to be made to preserve evidentiary issues for appeal; each question should address only one piece of evidence at a time); J. KAPLAN & J. WALTZ, *THE TRIAL OF JACK RUBY* 120-21 (1965).

86. FED. R. EVID. 611(c); *see also* 3 J. WEINSTEIN & M. BERGER, *supra* note 73, at ¶ 611[05] (1987).

87. FED. R. EVID. 611(c); *see generally* J. KAPLAN & J. WALTZ, *EVIDENCE: CASES AND MATERIALS* 28-29 (6th ed. 1987).

88. *Id.*; *see also* *Hutter Northern Trust v. Door County Chamber of Commerce*, 467 F.2d 1075, 1078 (7th Cir. 1972) (refusing to permit *pro se* plaintiff to testify in narrative form).

uninterrupted story-telling form. However, under Rule 614, a court may itself call witnesses⁸⁹ in unusual circumstances and interrogate witnesses called by it or by a party.⁹⁰ The court will usually question a party's witness to clarify the testimony presented.⁹¹ However, a judge who exercises this privilege too energetically may be reversed on appeal.⁹²

III. PROBLEMS PRESENTED BY THE CURRENT TREATMENT OF SCIENTIFIC EXPERTS

Criticism of an existing situation is a constructive instrument of reform.⁹³ My critique of the current use of party-sponsored experts is presented in this spirit of criticism and advocates reform.

A. Co-opting the Expert: A Loss of Autonomy

The current system regulating party-sponsored expert witnesses permits each side to shop for experts who favor its position and to co-opt the experts in the course of using their expertise.⁹⁴ The first time an expert discusses his testimony is almost always prior to trial. To insure that the expert's testimony will be favorable, the attorney discovers at the outset exactly what that expert testimony will be, before he even considers calling the expert as a witness. Thus, in a sense, the lawyer captures⁹⁵ the expert, and with it the expert's ability to form an independent opinion.

Even if the expert honestly believes the opinion that the attorney seeks to propound, the expert still experiences a form of coercion or co-option that taints the expert's views. Through the repeated contact with counsel in preparation for trial, the expert begins to identify with the side that hired him. In addition, the party who hires the expert will pay for the expert's services, which allows another opportunity for coercion to seep into the lawyer-expert relationship.⁹⁶ Each time the expert confers with the attorney, the expert's testimony and the attorney's viewpoint grow more congruent.⁹⁷

89. FED. R. EVID. 614(a).

90. FED. R. EVID. 614(b).

91. See J. WEINSTEIN & M. BERGER, *supra* note 73, at ¶ 614[03].

92. *Id.* at ¶ 614[03].

93. "Criticism is the spur of reform; and Burke's admonition that a healthy society must reform in order to conserve has not lost its force." *Dennis v. United States*, 341 U.S. 494, 549 (1951) (Frankfurter, J., concurring).

94. See Van Dusen, *supra* note 1, at 500 (describing this phenomenon as bias, even if an unconscious one, because the experts are paid by the party for whom they testify).

95. "Capture" is often used in economic analysis to describe what happens when an industry has great influence over its own government regulators. See Wiley, *A Capture Theory of Antitrust Federalism*, 99 HARV. L. REV. 713 (1986).

96. See Van Dusen, *supra* note 1, at 500.

97. For a description of this process see Sink, *supra* note 5, at 197 (a testifying expert is imbued with "team spirit" which makes him reluctant to damage the interests of his side). This phenomenon is similar to that which occurs when employees of an institution must advocate the institution's views. In these situations, the employees' views begin to mirror the views of the institution.

For an expert, such identification runs counter to the rationale for the provision of real expert testimony—the provision of expertise. Expertise operates successfully only when the expert can question his own assumptions, change his mind, and generally act as an autonomous person who exercises intuitive thought reflectively upon analytical knowledge and experience. Autonomy permits an expert to act as he thinks best, including the freedom to rely upon the intuitive understanding of situations and the freedom to change his mind as he learns more about the questions put to him.

In contrast, a paid party-sponsored expert is less free to act as she see best. By the end of trial preparation, an expert will often espouse only views which support the side paying her. An expert will downplay the opposing side's view in her own mind. Although an expert may truly believe that she is exercising her professional judgment, the pressures at play logically indicate that she is not. To be truly autonomous, an expert must be free to change her mind as experience and additional facts provide valuable feedback to test her theoretical assumptions. The inevitable identification that occurs between the scientific expert and the attorney's position interrupts the feedback loop that is supposed to test the theoretical assumptions underlying an expert's opinion. Identification with one side perverts an expert's best judgment.

To illustrate, imagine one side buying the best person, the real "Einstein" of the field.⁹⁸ At first glance, it would appear advantageous to truth-seeking to let this person testify—which of course it is. However, depending on the expert's ability to withstand influence, the world renowned expert's opinions may change from the time he first learns of the case to the time he actually testifies. Undoubtedly the degree of capture involved varies depending upon the parties involved, but it is likely that capture occurs to some degree in every case involving party-sponsored expert testimony.

B. Reducing the Expert to a Mere Competent: A Loss of Trust

An expert is reduced to a mere competent by the method of examination in the current system and by the effect of partisan identification with the side that hired him. Reduction of the expert to a competent results in a loss of trust in the expert's testimony. The tension between the need of the factfinder to trust experts who are exercising their expertise and the factfinder's need to scrutinize the expert's analysis and conclusions⁹⁹ is a clear problem caused by the current adversarial use of experts.

When a decision-maker can trust an expert, there is less need to scrutinize an expert's analysis and conclusions. But when there is a lack of trust, as when

98. L. Petrich, *Use of Expert Testimony and Surveys in Copyright Cases*, in *LITIGATING COPYRIGHT, TRADEMARK, AND UNFAIR COMPETITION CASES* 167 (Litigation and Administrative Course Handbook Series 1986) ("Some lawyers dealing in a very narrow field will make the effort to contact all the known experts in that field—on the hope that they have thereby blocked the use by their opponent of those experts, whether or not those experts are ever retained or testify."); Emerick, *Discovery of the Nontestifying Expert Witness' Identity Under the Federal Rules of Civil Procedure: You Can't Tell the Players without a Program*, 37 *HASTINGS L.J.* 201 (1985) (illustrating how retaining an expert can amount to a "capture" of the best person in a field).

99. See *supra* text accompanying note 59.

a party-sponsored expert is testifying, the inability to double-check and examine for flaws puts the factfinder in a difficult position. Distrust, which prompts the factfinder to want to control a situation, may lead to decomposition of the "whole" of the expert's expertise.¹⁰⁰ Such decomposition is fatal because it results in distortion and disintegration of thought.

Adversarial examination of experts forces the expert to weigh each word carefully in anticipation of its use by the other side.¹⁰¹ Fluid thought, the hallmark of expertise,¹⁰² is removed by this process. Hard and fast rules, each examined in a logical fashion, make the safest testimony for the party-sponsored expert. But an "expert" functioning in such a manner is no longer exercising expertise. The expert applies rules and states conclusions based on expertise, but because she cannot use her intuitive understanding, she has been transformed into a competent.¹⁰³

Cross-examination, as such, is not the only force leading to this transformation from expert to competent. Adding to the transformation is the fact that a party-sponsored expert feels compelled to espouse a viewpoint that is distorted in favor of his side.¹⁰⁴ This is similar to the point Justice Cardozo made when he stated that "[i]t is common knowledge that a camera can be so placed, and lights and shadows so adjusted, as to give a distorted picture of reality."¹⁰⁵ The lawyer's questions on cross-examination can, like the placement of a camera and lights, distort the reality of the situation which the expert is trying to explain. Like adversary cross-examination, where counsel prevents explanation by the expert and uses the expert's wavering against him, partisanship compels an expert either to make grand statements of his position, which would be open to attack on cross-examination, or to build a logical neat argument that can be explained in a series of steps. However, such neat arguments, proceeding in logical steps, are the arguments of competents.¹⁰⁶

Permitting someone who is a competent rather than an expert to testify about important issues litigated in our courts threatens the credibility of the decisions reached in these cases. When a court addresses, for example, the risk of harm which the Diablo Canyon Nuclear Power Plant poses because of a possible earthquake in Southern California,¹⁰⁷ it needs to hear "expert" advice, not just competent advice. People's lives and millions of dollars rest on the court's decision, the correctness of which depends upon the scientific accuracy of *expert* testimony.¹⁰⁸

100. See *supra* notes 16-20 and accompanying text.

101. See generally J. KAPLAN & J. WALTZ, *supra* note 87, at 28-29.

102. See *supra* notes 50-51 and accompanying text.

103. See *supra* notes 16-20 and accompanying text.

104. See *supra* text accompanying notes 94-98.

105. *Snyder v. Massachusetts*, 291 U.S. 97, 115 (1934) (arguing that to be admitted, a photograph should be verified by the oath of the photographer, who should be available for cross-examination on the manner in which he took it).

106. See *supra* note 47.

107. For an examination of this factual situation see, e.g., *San Luis Obispo Mothers for Peace v. United States Nuclear Regulatory Comm'n*, 799 F.2d 1268, 1270 (9th Cir. 1986).

108. Many cases illustrate the factual dilemmas that a court faces. Returning to a familiar example, in *San Luis Obispo Mothers for Peace v. Nuclear Regulatory Comm'n*, 751 F.2d 1287 (D.C. Cir. 1984), *vacated in part* (en banc), 760 F.2d 1320 (D.C. Cir. 1985), the majority declined to re-

C. Loss of Intuitive Understanding in Assessing New Situations: A Loss of Truth

Another cost to the legal system of the current party-sponsored expert system is a loss of the ability of experts to exercise their "intuitive understanding"¹⁰⁹ to forecast the results of future events.¹¹⁰ Lawyers tend to believe that the examination of both sides of the story will produce the "truth", the historical fact of what actually occurred. Although this may be true in the usual case in which a court is asked to look backwards, the basic assumption that two adversaries vigorously advocating their respective positions will produce the truth is an untrue assumption in most cases in which experts testify. Often the expert testifies about something that is not a past fact, and instead the expert is asked to give opinions of what will happen in the future. An expert who has been reduced to a mere competent will not be able to exercise the kind of intuitive understanding necessary to make these predictions. Permitting each side to pick someone who favors its position does not in any way guarantee that truth will emerge.

D. Battle of the Experts: Rejection of Scientific Evidence

In a case in which expert testimony is crucial, any battle of the experts can cause the jury to disregard important evidence.¹¹¹ A jury will tend to disregard the testimony of both experts in such a case and, thus, decide the case without the help of expert evidence,¹¹² because it would consider the experts to be

view the substance of the Nuclear Regulatory Commission regulations concerning emergency preparedness. Judge Wald noted in dissent the importance of thorough judicial review of an agency's actions "in the area of nuclear power regulation [where] even a small lapse in rational decision making may have the most profoundly devastating consequences on public health and safety" and suggested that the court should have required the Commission to consider the effect of earthquakes on emergency planning for the Diablo Canyon Nuclear Power Plant because "refusal to make explicit provision in emergency response plans for an earthquake in a nuclear plant within three miles of a major, active fault . . . is by definition an arbitrary . . . act." *Id.* at 1330, 1335. See generally Note, *Diablo Canyon Licensing Oversight: Does the NRC Licensing Process Assure Nuclear Safety?*, 21 NEW ENG. L. REV. 77 (1986) (questioning whether judicial deference to NRC determinations produces wise decisions).

109. See *supra* text accompanying notes 54-56 (explaining intuitive understanding).

110. In some situations, this inability to get expert forecasts could bar suits completely. See, e.g., *Gwaltney of Smithfield v. Chesapeake Bay Found.*, 108 S. Ct. 376, 384-85 (1987) (plaintiff cannot survive motion to dismiss case brought under Clean Water Act without alleging either current, continuing, or intermittent violations of the Act). Where there is no evidence of current violations and the only data available to a citizen will be reports which rely upon past data, plaintiffs may have to rely upon an expert's prediction from past violations that there is a continuing or intermittent violation.

111. Cf. *Imwinkelried*, *supra* note 15, at 567-70 (jurors may disregard scientific evidence of which they are skeptical).

112. The law permits the jury to disregard evidence when the evidence is not trustworthy. For example a sample jury instruction used in the Fifth Circuit charges the jury that:

The rules of evidence provide that if scientific, technical, or other specialized knowledge might assist the jury in understanding the evidence or in determining a fact in issue, a witness qualified as an expert by knowledge, experience, training, or education, may testify and state his opinion concerning such matters.

You should consider each expert opinion received in evidence in this case and give it such weight as you may think it deserves. If you should decide that the opinion of an expert witness is not based upon sufficient education and experience, or if you should conclude that the reasons given in support of the opinion are not sound, or that the opinion is outweighed by other evidence, then you may disregard the opinion entirely.

untrustworthy.¹¹³ Thus, scientific evidence would be removed from the decision-making process.¹¹⁴

IV. TWO PROPOSALS TO INCREASE COURT APPOINTMENT OF SCIENTIFIC EXPERTS

Any proposal for changing the way experts participate in federal court must address the following three problems identified by this Comment: the degree of side identification, the undermining of objective truth, and the inability of the legal system to avail itself of the expertise of the best people in science. The legal process needs new methods in order to realize the full value of scientific evidence.¹¹⁵ This Comment makes two possible proposals: a legislative proposal and a judicial proposal that modifies current Rule 706.

A. The Legislative Proposal

1. Structure of the Proposal

The current system of party-sponsored experts needs to be modified in order for the court system to utilize fully the expertise of experts who assist the triers of fact. The legislative proposal would add a party-negotiated expert to mechanisms already in place under Rule 706 of the Federal Rules of Evidence. Party-negotiated, court-appointed experts would be heavily favored over party-sponsored experts, with the latter being used only in exceptional cases.

The legislative proposal would mandate a new system for selecting experts. The parties would first submit to the court a list of subject areas in which they desire expert testimony.¹¹⁶ This list would be accompanied by a list of cleared experts corresponding to each suggested subject area. The parties would then negotiate with each other to decide which *one* expert will testify

PATTERN JURY INSTRUCTIONS (CIVIL CASES) § 6 (Comm. on Pattern Jury Instructions District Judges Ass'n Fifth Circuit 1980) (emphasis added).

113. See *supra* text accompanying note 59.

114. In cases in which there may be extensive ramifications from an erroneous decision, this loss of credibility is very costly, because these are precisely the cases in which the legal process needs to bring experts into the dispute resolution process. See *supra* note 2 and text accompanying notes 11-15.

115. A few years ago, there was serious discussion of the creation of a specialized "science court." The proposal to create such a court seemed partially a response to the perceived inability of the current system to successfully adjudicate scientific disputes. Proponents intended it "as an adversary forum in which scientists with different views on controversial issues would argue in structured debates before unbiased scientific judges. Debate would be limited to questions of fact: judges would give opinions only on factual matters[.]" Jasanoff & Nelkin, *Science, Technology, and the Limits of Judicial Competence*, 214 SCIENCE 1211, 1214-15 (Dec. 11, 1981).

Professor Tribe argues against such a method of factual decision-making believing that it separates the scientific issue from the underlying value choices. Professor Tribe calls such values "fragile values." See Tribe, *Ways Not To Think About Plastic Trees*, in WHEN VALUES CONFLICT: ESSAYS ON ENVIRONMENTAL ANALYSIS 61-92 (L. Tribe, C. Schelling & J. Voss eds. 1975). I agree with Professor Tribe that decision-making involving scientific disputes needs to remain integrated; bifurcated decision-making tends to squeeze out values that are non-quantifiable, intangible, and resist categorization. My proposal favoring court-sponsored experts leaves value choices and decisions based upon scientific fact with the same decision-maker—with the factfinder. See *supra* text accompanying notes 94-98.

116. This submission would occur during discovery. Each court would have discretion to decide when in the discovery process this would occur. I suggest adding this part of the proposal to the Federal Rules of Civil Procedure to provide advance notice to the parties. See, e.g., FED. R. CIV. P. 30(b), 31 (notice of deposition and notice of deposition upon written questions, respectively).

concerning each subject matter.¹¹⁷ Prior to trial, the court would instruct all of the chosen experts that they owe their allegiance to the court and to the search for truth, and that they are not to treat either side more favorably than the other side.¹¹⁸ The court should permit discovery by both sides of the expert's proposed views, so they may prepare to challenge or support the testimony.¹¹⁹ During the trial, each side would be able to call and to cross-examine the expert, but the court should grant the expert freedom to explain answers rather than holding the expert strictly to the precise question asked.

If the parties cannot agree on a single expert, they would submit to the court a list of three candidates, along with each expert's credentials. The court would then again try to get the parties to agree upon an expert. If an agreement is still elusive, however, then the court would independently appoint the expert from the list of proposed candidates.

As a last resort, the court could permit dual experts to air openly diverse views on subjects the court finds highly controversial¹²⁰ or where the use of

117. Negotiation is an express option in current Rule 706, which states "[t]he court . . . may request the parties to submit nominations [and] [t]he court may appoint any expert witnesses agreed upon by the parties . . ." FED. R. EVID. 706(a).

118. An example of a court's written instruction to a court-appointed expert states:

*Instructions to Court-Appointed Expert Witness
Dr. Harry Jackson Till*

Dr. Till, this Court has appointed you as an expert witness in this case under Federal Rule of Evidence 706. Said Rule is set out in its entirety in the accompanying Memorandum Opinion and Order. You are to examine the plaintiff in connection with his hernia complaints.

Duty of the Court-Appointed Expert Witness:

Since it is the Court who appointed you, it is to the Court, not the parties, that you owe your allegiance. The Court will expect you to remain neutral, fair and free of prejudice in all your contacts with the parties. You should examine plaintiff with the questions the Court poses below in mind. It is your role to explain what your examination of plaintiff revealed, to tell the truth as most fully and completely as you can. The Court seeks not only your examination skills, it seeks your best and soundest judgment. Truth, fairness and your medical judgment should guide you as you examine plaintiff.

Questions:

Dr. Till, you should be prepared to answer the following questions: 1. What type of hernia does plaintiff have? 2. Does plaintiff's hernia require corrective surgery? 3. If plaintiff's hernia requires surgery, would you consider a doctor who recommended "no surgery" to have acted with callous indifference to the serious medical needs of the patient?

Responsibilities:

After your examination you should write down your findings and your answers to these questions. Feel free to include any other observations you think may be relevant which the Court has failed to identify. You should send this written report to the Court.

Just as in any case, the parties are free to take your deposition, that is, ask you questions under oath with a court reporter taking down your answers. However, they should wait until after you have submitted your written report.

If this case goes to trial, the Court will call you as a witness. Of course, as stated above, you owe your allegiance to the Court and to truth.

Defendants' counsel, Hon. Bobby N. Bright, or possibly someone with the Alabama Department of Corrections, should contact you soon to arrange to bring plaintiff to your office. If you have any questions, feel free to call.

Instructions to Court-Appointed Expert Witness, Lee V. Granger, No. 87-H-286-N (M.D. Ala. Mar. 1, 1988).

119. Rule 706 currently authorizes either party to take the deposition of court-appointed experts. FED. R. EVID. 706(a). See 3 J. WEINSTEIN & M. BERGER, *supra* note 73, at ¶ 701[02] (commenting that this increases the chances that the truth will be ascertained).

120. These highly controversial areas of science pose the same problem addressed by the *Frye* rule. See *supra* note 60 (discussing the impact of the *Frye* rule's approach to admitting questionable

party-sponsored experts is in the interest of justice.¹²¹ Finally, the court would assign the cost of the experts to the losing side, with discretion to modify as the court sees fit.¹²²

The purpose of this scheme is to encourage an expert to identify with the court rather than with the side that hires him. The result should be deeper objective truth presented to the factfinder, better quality experts participating in the legal system, and an increased degree of credibility for the legal system in the community. This should lead the court closer to "mutual conciliation rather than adversary confrontation."¹²³

The burden of discovering who is truly an expert in each field should be placed upon the parties rather than the court. This is because the parties are in the best position to know the subject areas in which an expert's testimony will assist the factfinder in better understanding the case.¹²⁴ The nature of the final selection process will temper each side's desire to nominate only those experts who are favorable to it. Wise counsel will also include more moderate experts on the list to permit retreat during negotiation to a neutral position that each party considers acceptable. The bargaining nature of the selection process would result in a wide range of expert viewpoints being represented during the submission stage. When few experts testify, or only one testifies, the bargaining produces one expert in each area who has testimony to assist both sides, an expert more neutral than one that would be chosen by either of the parties in a non-negotiated situation. If the case requires experts in numerous subject areas,

scientific evidence). There is a place for the problem *Frye* attempts to address. My approach is to permit the battle of experts since the suggested area is so new or unexplored that no one really knows what to think. For example, see *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 103 (1983) (environmental effects of nuclear power plant's fuel cycle is an area "at the frontier of science").

121. Psychiatric examination in criminal cases seems a truly nebulous area in which the use of battling experts probably works as well or better than the use of one expert. Furthermore, the criminal defendant may have a constitutional right to his own expert. For an illustration of the use of experts in situations in which no one expert possesses the conclusive answer see *Barefoot v. Estelle*, 463 U.S. 880 (1983); see also *supra* note 23 (works discussing the possible unreliability of psychiatric testimony).

122. Current treatment is to tax the costs of Rule 706 experts. See 28 U.S.C. § 1920 (1983); see *MANUAL FOR COMPLEX LITIGATION* 140 (5th ed. 1982) (compensation should be taxed like other costs); see generally T. WILLING, *COURT-APPOINTED EXPERTS* 14-17 (Federal Judicial Center 1986) (describing procedures for allocating and paying expert witness costs).

Naturally, a court-appointed expert is entitled to reasonable compensation. FED. R. EVID. 706(b). In a case in which one party is proceeding *in forma pauperis* or the litigation is apt to be protracted so that the taxing of costs may occur long after the expert lends her services, Rule 706(b) empowers a court to deviate from the usual method of taxing costs at the end of the case. Specifically Rule 706(b) states that: "the compensation shall be paid by the parties *in such proportion and at such time as the court directs*, and thereafter charged in like manner as other costs." FED. R. EVID. 706(b) (emphasis added). A trial court's discretion is broad in deciding the method in which witness costs are administered. See, e.g., *United States Marshals Service v. Means*, 741 F.2d 1053, 1057 (8th Cir. 1984) (en banc) (holding that the trial court has the power to call a party's witness as the court's own and then order the opposing side to advance fees and expenses).

123. M. SHAPIRO, *COURTS, A COMPARATIVE AND POLITICAL ANALYSIS* 15 (1981) (the prototypical court is less adversarial than one might imagine; the business of the court is bringing two disputing parties to a resolution).

124. The submission of the expert list by each party to the court uses the parties' knowledge in a form of range-of-choice discretion. See *supra* note 26 (explaining range-of-choice discretion).

then the expected result is that the parties will allow plaintiff's expert A to testify about one subject and defendant's expert B to testify about another—quasi-*quid pro quo* bargaining. Although such bargaining could result in the selection of less neutral experts than would be selected when there are few experts in the case, it would still lead to the selection of a panel of experts with fewer adversarial allegiances than under the current system.

If the parties deadlock on any of the slots, then the court would step in to provide a solution. By submitting suggested names and then narrowing down the list during the bargaining process, the parties would provide the court with a short list from which to choose an expert based upon credentials, experience, and particular areas of expertise. The list of experts and the court order appointing an expert together would create a record that would facilitate appellate review of the trial court's choice and would offer some guidance for future cases. The court should also be free to choose an expert who does not appear on either side's list although this would probably be the exception rather than the rule.

The part of this proposal most vulnerable to judicial bias would be the court's selection of an expert from the short list. The proposal's bargaining process would, in most circumstances, render court selection of an expert unnecessary. When such a situation does occur, it can be handled by case law, that should emphasize selection of the person with the best credentials and as impartial as possible. Inevitably some bias will creep in, but this would not approach the degree of distortion that now exists with party-sponsored experts.

Once experts have been chosen, the court's primary task would be to instruct them, on the record, about their duty to the court.¹²⁵ The court can assure the experts that their role is to explain what they know, regardless of the effect of that testimony on either party, rather than to be subject to an elicitation of selective testimony.¹²⁶ A conscious identification with the court and truth would release the expert to act as an "expert," rather than as a mouthpiece of one party's view of the situation.¹²⁷

The method of examination should begin with a narrative of the expert's view or understanding of his speciality. Then the parties should, at the discretion of the court, be able to ask leading questions of the expert. However, the court should supplement the leading questions with clarifying questions to round out the examination for the benefit of the factfinder. Because the expert owes express allegiance to the court, the court should take care not to appear biased toward either side. The court, in recognition of the expert's expertise, should permit the expert freedom to answer questions with the objective of uncovering the opinion of the expert in all its complexity. Unhindered by the adversary nature of the questioning, this would allow the expert to think freely and honestly. This will not lead to uncontrolled testimony, because of the court's discretion to allow a party to put leading questions to a hostile expert.¹²⁸

125. See *supra* note 118.

126. *Id.*

127. See *supra* note 5 (noting the problems of expert identification with the party that hires her).

128. Such authority should be within the trial court's discretion vis-a-vis the rule of law. See *supra* note 26 (explaining types of discretion).

The opportunity to examine fully how the expert arrives at her opinion would assist the factfinder in its truth-seeking function. This approach would encourage the expert to exercise expertise and would encourage the best people in a specialized field to act as expert witnesses because they would believe that they can testify to the "whole" truth of a situation, regardless of its effect on either side. An expert fully conversant in a specialized scientific area does not want to operate under the artificial restrictions that a lawyer places on him by asking him to put forth a new "truth" consistent with the lawyer's viewpoint. The parties will still have the opportunity and duty, as they do now upon cross-examination, to expose to the factfinder the expert's biases which may color the expert's viewpoint. However, cross-examination would no longer be an exercise that reduces experts to incompetents. Reflective discussion still can be expertise, but that would differ from the current system in which an expert espouses one view without qualification.¹²⁹ Nevertheless, the factfinder would hear what the expert has to say, supplemented by probing questions from counsel and the court to round out the examination.

In special circumstances, the court should allow each of the parties to present an expert, following the current practice of party-sponsored experts. The court would justify, on the record, why the particular subject matter requires an open airing of diverse views using party-sponsored experts. Such special circumstances should be limited to two situations: a highly controversial subject area that is best understood through presentation of opposing views, and when the use of opposing experts is in the best interest of justice.¹³⁰ A good example of when justice would be served by the presentation of diverse views is in the death penalty phase of a trial for a capital offense. Psychiatric experts for each side would testify about the "dangerousness" of the defendant.¹³¹ Thus, the so-called "battle of the experts" would occur in only a narrow range of cases.

Where a dispute involves a highly controversial area of a scientific discipline, allowing only one expert could, by the highly charged nature of the subject area, virtually determine the outcome of the case.¹³² In this situation, the court should allow the parties to present the divergent views of the scientific community by using two or more experts. For example, imagine a case in which the

129. See *supra* text accompanying notes 94-98 (examining the co-opting of experts).

130. See *supra* notes 120-121 and accompanying text. Appellate courts would need to develop guidelines for applying these exceptions. The "best interests of justice" exception would probably be limited to criminal cases. As previously discussed, a defendant in a criminal case would probably have a constitutional right to call his own expert witnesses.

131. The United States Supreme Court ruled in such a case that a psychiatrist's testimony predicting dangerousness was admissible despite its scientific uncertainty. *Barefoot v. Estelle*, 463 U.S. 880, 899-901 (1983). Justice Blackmun makes a strong argument in the dissent for exclusion of this type of evidence based upon its unreliability. *Id.* at 926-30 (Blackmun, J., dissenting). For a good explanation of the dubiousness of psychiatric material see Levine, *The Adversary Process and Social Science in the Courts: Barefoot v. Estelle*, 12 J. PSYCHIATRY & L. 147 (1984). Nevertheless, *Barefoot* is a good example of the use of opposing experts in a controversial area.

132. A party who wishes to argue that a dispute involves a highly controversial scientific area would move to have party-sponsored experts. In considering such a motion, the judge should keep in mind that party-sponsored experts should be reserved for exceptional cases.

scientific issue before the jury is the following: how does AIDS spread and can men get AIDS from women?¹³³ Because the transmission of AIDS is still such a mystery to medical science,¹³⁴ diverse views on this question would be most helpful to the jury. The loss of expertise would be more acceptable because, by definition, this is an unsettled area of scientific inquiry, and thus no person alone is an "expert."¹³⁵ In some undeveloped area of science, all scientists are only competents trying to understand the causes and dimensions of the issues. Although the use of party-sponsored experts diminishes the expertise of each witness, if this is reserved for situations which experts would agree are controversial, quality experts will respect such use of the adversary system. A factfinder could still make an informed decision as possible after listening to multiple experts. Reserving party-sponsored expert testimony for active controversies in the scientific community would both focus the controversy and maintain the court's integrity.¹³⁶

Assignment of the costs of court-appointed expert witnesses is another issue. Currently, the court has discretionary power to order the losing party to pay the costs of the expert witnesses.¹³⁷ The court also has the express authority to apportion the costs between the parties in its discretion.¹³⁸ Similarly, under this proposal, the cost of the court-appointed expert should normally be taxed to the losing party. In circumstances where each party would normally pay its own costs,¹³⁹ the parties should split the cost of the court-appointed expert equally. Since only one expert would be used rather than two for each subject area, the cost to the losing party is no more than if each party paid for its own experts. In addition, in an area in which only one or two people are experts, this system of party-negotiated experts would help prevent the wealthier party from "buying" all the experts.¹⁴⁰ Thus, this system has the added benefit of helping to equalize the positions of the parties in some circumstances.¹⁴¹

133. The context might be a murder trial where a woman with AIDS had sexual intercourse with the murder victim who later died of AIDS and her defense is one of causation.

134. K. Leishman, *San Francisco: A Crisis in Public Health*, ATLANTIC MONTHLY, Oct. 1985, at 18, 22, and 24 (Notes & Comments) (still debate over cause of transmission of AIDS). See generally Moriarity, *AIDS in Correctional Institutions: The Legal Aspects*, 1987 CRIM. L. BULL. 533; Landesman, Ginzburg & Weiss, *Special Report: The AIDS Epidemic*, 312 NEW ENG. J. MED. 5221 (1985).

135. When the trial court decides that a scientific matter is highly controversial or that the case requires diverse experts for justice to be served, the court's discretion is discretion vis-a-vis the rule of law. See *supra* note 26 (explaining types of discretion).

136. In contrast, for an example of the use of a court-appointed expert in a case involving a non-controversial area of science see *Kaehni v. Diffraction Co.*, 342 F.Supp 523 (D. Md. 1972), *aff'd without opinion*, 473 F.2d 908 (4th Cir.), *cert. denied*, 414 U.S. 854, *reh'g denied*, 414 U.S. 1033 (1973) (court-appointed expert testified regarding physical properties of light). In this case, the court also exercised its power to question the expert witness. *Id.* at 527.

137. See *supra* note 122; 28 U.S.C. § 1920(6) (1982).

138. For examples of such circumstances, see T. WILLGING, *supra* note 122, at 14-15. See also FED. R. EVID. 706(b).

139. T. WILLGING, *supra* note 122, at 14.

140. *Id.* at 15 & n.53.

141. Of course, each side can still hire an expert to educate its own lawyers, but consulting experts would not testify.

2. *How the Legislative Proposal Addresses Problems Caused by Current System of Party-Sponsored Experts*

a. Elimination of co-opted experts: preserving autonomy

Using one expert picked by negotiation or by the court from a short list would help infuse truth into the scientific inquiry. Negotiation would force the parties to pick experts with more neutral viewpoints, which would in turn allow the jury to hear a more balanced explanation of the scientific issues. This would eliminate the "buying" of a viewpoint to support an untenable position.¹⁴²

A court-sponsored expert system would prevent co-option of the expert. The expert remains neutral and detached, much like the jury. Capture would be avoided because the hours of preparing the expert would never occur and the thirty pieces of silver would never change hands. No bond would grow between one party and the expert; thus the phenomenon of side identification would never have a chance to color the expert's thinking. Throughout the process, the expert would remain an autonomous person who can question her assumptions and change her opinions as new facts become known. With the legislative proposal, expertise would operate where once showmanship ruled supreme.

b. Elimination of the factors which reduce an expert to a mere competent: restoring trust

Changing the method of examination would guarantee that an expert, rather than a competent, testifies. Using one non-party-sponsored expert would allow the expert to speak freely with no secrets to hide or weak points to avoid. The expert could discuss the given topic in a fluid manner, fully expressing his expertise.

The Dreyfus brothers' description of the fluidity of thought and action an expert experiences illustrates this concept. They state that "[w]hen things are proceeding normally, experts don't solve problems and don't make decisions; they do what normally works."¹⁴³

142. Van Dusen, *supra* note 1, at 500. Even as far back as 1858, the United States Supreme Court remarked in a patent case that "[e]xperience has shown that opposite opinions of persons professing to be experts may be obtained to any amount[.]" *Winans v. New York & Erie Ry. Co.*, 62 U.S. (21 How.) 88, 101 (1858).

143. See H.L. DREYFUS & S.E. DREYFUS, *supra* note 30, at 30-31 (emphasis omitted). Their longer explanation of this idea is worth considering. They state:

An expert generally knows what to do based on mature and practiced understanding. When deeply involved in coping with his environment, he does not see problems in some detached way and work at solving them, nor does he worry about the future and devise plans. . . . An expert's skill has become so much a part of him that he need be no more aware of it than he is of his own body.

The expert driver becomes one with his car, and he experiences himself simply as driving, rather than as driving a car, just as, at other times, he certainly experiences himself as walking and not, as a small child might, as consciously and deliberately propelling his body forward. Airplane pilots report that as beginners they felt that they were flying their planes but as experienced pilots they simply experience flying itself. . . . Similarly, the expert business manager, surgeon, nurse, lawyer, or teacher is totally engaged in skillful performance. *When things are proceeding normally, experts don't solve problems and don't make decisions; they do what normally works.*

Id.

Allowing the expert to first testify in narrative form would permit a more fluid thought process to occur before the leading questions of the parties test the expert's assumptions.¹⁴⁴ This difference is not a difference in degree, it is a difference in kind. Expertise is a different sort of understanding than mere competence. It is this highest level of human understanding that this proposal seeks to unfetter in the legal dispute process through the use of court-appointed experts.

c. Preservation of the expert's intuitive understanding: restoring truth

Just as allowing the expert to explain his opinion in narrative form before question and answer begins would permit an expert to act like an expert, so does the use of only one expert. As stressed above, the hallmark of expertise is natural, fluid thought. An expert's opinion is apt to both support and refute each side's position. Otherwise, there would not be a dispute. Without an eye toward the end result of the litigation, the expert can express his *whole* position in all its complexity.

Compare this to the current situation in which each side's expert must focus on the facts which support his sponsor and downplay the other side's position. The distorted picture which results from this battle of the experts does not result in a whole, fully fleshed-out view of a complex scientific issue.

Using only one expert would permit more sophisticated testimony by the expert. The attorney could question the expert about his testimony to permit the factfinder to reflect upon it. The key would be to encourage the expert to use his intuitive understanding. Fluid thought would release the expert's expertise. This would be especially crucial in cases in which the expert is called upon to use expertise to predict future consequences, where intuitive understanding—the ability to apply expertise to new situations—is most helpful. For example, "[e]xpert nurses will sometimes sense that a patient lies in danger of imminent relapse and urge remedial action upon a doctor."¹⁴⁵

d. Retention of the benefit of scientific expertise: restoring credibility

Allowing scientists to act like scientists would protect the credibility of the legal system in the jurors' and the experts' minds. The jury is less likely to ignore scientific data if the presentation of it does not conflict unnecessarily.

The key idea is that experts simply act and react. They do not apply rigid rules to a particular fact pattern. Instead they "see" both the solution and the result in a given fact pattern. An expert's narration of both solution and result is what expertise is all about; that is what this Comment wants to introduce into the legal dispute process. The legislative proposal does this by having the expert explain his opinion in *narrative* form before the choppy form of question and answer explanation begins.

144. The classic form of examination in which the lawyer asks a single question such as "what color was your car?" and the witness answers "red," breaks up the fluidity that is the essence of expertise. Question and answer makes sense when the purpose is to explain how an accident occurred or some other historical fact. What the legislative proposal does is postpone question and answer until *after* the expert has explained his opinion in narrative form. Thus, an expert can reflect upon his intuition and use expertise when responding to questions.

145. H.L. DREYFUS & S.E. DREYFUS, *supra* note 30, at 34.

A jury wants to believe in the validity of the process in which it participates. Party-sponsored experts who spar force the jury to concentrate on their clash rather than the substance of the dispute. The jury's faith in the judicial system is a precious asset, particularly in a cynical age in which people do not trust the courts or their officers, the lawyers.¹⁴⁶ The use of a single expert would allow the jurors to place their trust in the expert. This trust is necessary for the expert to convey his expertise.¹⁴⁷

In addition, allowing an expert to be honest and forthright rather than evasive or manipulative permits the expert to have a positive experience with the legal system. Outstanding scientists would be more receptive to testifying in court if they felt that they do not owe their "bosses," the people who hired them, a certain outcome. This problem of quality scientists' reluctance to involve themselves in a serious lawsuit harms the integrity of the legal system. If an expert knew allegiance was owed to the court and to truth, the expert most likely would view testifying much like jury duty—a civic trust that can be both-ersome but necessary in a civilized society.

B. The Judicial Proposal

1. *The Structure of the Proposal*

The legislative proposal represents complete reform. However, half-way solutions appeal to the practical mind because they appear possible without tremendous effort. The judicial proposal, a more modest reform, takes advantage of the current structure of the Federal Rules of Evidence. It stresses the court's use of the current court-appointed expert Rule 706.¹⁴⁸ With minor differences, this proposal parallels the legislative proposal. However, in practice this judicial proposal both retains some of the problems of the present system and loses some of the improvement offered by the legislative proposal. The judicial proposal combines the use of party-sponsored experts¹⁴⁹ with the legislative proposal's nearly exclusive use of court-sponsored experts.¹⁵⁰ The end result of the judicial proposal is the use of party-negotiated experts, a situation already provided for in Rule 706. For this proposal to work, a trial court would need to exercise its power either to appoint experts or to force the parties to come to an agreement about which experts will testify.

The judicial proposal shifts the emphasis of using experts from Rule 702 party-sponsored to Rule 706 court-sponsored. Rule 706 permits a court to appoint an expert of its own choice or from nominations by the parties.¹⁵¹ This nomination provision is similar to the legislative proposal's requirement that the parties submit a list of candidates with credentials attached. Rule 706 requires

146. The notion that a lawsuit is simply a "game" for lawyers is not an uncommon perception among non-lawyers.

147. See *supra* text accompanying notes 56-59 (examining an uncorrupted exercise of expertise).

148. See *supra* notes 68-83 and accompanying text (examining Rule 706).

149. See *supra* notes 63-67 and accompanying text (explaining party-sponsored expert Rule 702).

150. See *supra* text accompanying notes 116-141 (discussing the legislative proposal).

151. FED. R. EVID. 706 (a). See *supra* note 69 for the complete text of this Rule.

the court to inform the expert of his duties in writing or at a conference, which the parties may attend.¹⁵² As with the legislative proposal, the court instructs the expert concerning her allegiance to the court and to truth.¹⁵³ In addition, under the judicial proposal the expert would advise the parties of any findings and be available for deposition by the parties, which is comparable to the legislative proposal's discovery mechanism.¹⁵⁴ The use of cross-examination by both parties also resembles the legislative proposal, except that the legislative proposal expressly permits the expert more latitude to explain the questions posed by counsel.¹⁵⁵

However, Rule 706(d)'s escape clause, "[n]othing in this rule limits the parties in calling expert witnesses of their own selection[,]"¹⁵⁶ would neutralize all the presumptions of the judicial proposal. This clause leaves the use of court-appointed experts to the whim of the trial court. The judicial proposal turns that presumption on its head and makes quasi-court-sponsored experts the rule with party-sponsored experts the exception.¹⁵⁷ A court that would want to use the judicial proposal seriously would need to use its influence with the parties to attempt to limit the use of party-sponsored experts. However, even without such strong-arm tactics, a court that actively uses Rule 706 would gain the benefits of the expert's full expertise and the availability of higher quality experts.¹⁵⁸

2. *Application of the judicial proposal to current problems*

a. *Eliminating Co-opted Experts*

Utilizing Rule 706 with more "gusto" would not, by its own terms, eliminate co-opted experts. An expert who is wedded by money or contact to one party may still testify under the express terms of Rule 706(d). However, introducing the court-appointed expert into the trial would probably reduce the impact of party-sponsored experts.¹⁵⁹ A lawyer who had planned to use a "hired gun" might think twice about doing so for fear of how foolish his hired gun might look in comparison to the more balanced viewpoint of a court-appointed expert. While the more complete solution available through legislative change would do more to reduce the threat of co-opted experts, the judicial proposal's emphasis on court-appointed experts would help reduce the impact and use of co-opted experts.

152. *Id.*

153. *See supra* notes 125-127 and accompanying text.

154. *See supra* text accompanying notes 116-141.

155. *See supra* notes 128-129 and accompanying text.

156. FED. R. EVID. 706(d).

157. A judge can informally control a case by discouraging overuse of party-sponsored experts.

158. *See supra* text accompanying notes 142-144 (explaining how the legislative proposal attacks the problems of the current system).

159. *Kian v. Mirro Aluminum Co.*, 88 F.R.D. 351, 356 (E.D. Mich. 1980) (court feared trial by expert).

b. Retaining the Expert's Status as Expert

The Federal Rules of Evidence constrain methods of witness examination.¹⁶⁰ Although a court may control the progress of a trial,¹⁶¹ permitting the trial court some room to control a trial does not mean that a court can permit all experts to testify first in narrative form, and then allow liberal cross-examination by the parties, as the legislative proposal would permit. By implication, the Federal Rules do not permit such expanded examination, and a court should abide by Congress' intent to control a witness's testimony.

Thus, the judicial proposal does differ from the legislative proposal in that an expert testifying under Rule 706 only answers the questions propounded rather than explaining the testimony in narrative form. Although this difference reduces the ability of an expert to set forth her views in an undivided manner, relaxing the strictures imposed by being allowed to answer only the questions asked, and by the court asking additional questions, the expert can put forth a unified picture of how she views an issue.

c. Preserving the Expert's Intuitive Understanding

As in the legislative proposal, permitting the parties to use their own experts in addition to the court-appointed expert would theoretically not affect the ability of the court-appointed expert to utilize intuitive understanding of a problem. However, in practice, if a court-sponsored expert testifies after a party's expert testifies on the same or a related subject, the court-appointed expert might be tempted to reduce the testimony to rule-bound answers, in the manner of a competent or proficient. This would reduce the expert's ability to rely upon her own intuitive understanding.

d. Preserving the Benefit of Scientific Expertise

Having three experts testify about a subject—one for each side and one by court-appointment—could be confusing to a jury. Whether a jury would disregard the court-appointed expert's viewpoint would depend on the dynamics of the particular case. At a minimum, the jury might disregard some testimony because of its apparent repetitiveness, although the testimony might in fact not be repetitive. Thus, some of the benefits of scientific testimony would be lost because party-sponsored experts would be allowed to testify in addition to court-appointed ones. Furthermore, some experts may be unwilling to testify, because they fear their testimony will not be given the weight it deserves. This problem, however, seems minimal, given the other protections of the judicial proposal. Thus, the court's ability to attract the best scientists as expert witnesses would probably not be diminished by allowing the testimony of party-sponsored experts, unless the experts were to fear "guilt by association" with party-sponsored experts.

160. FED. R. EVID. 611.

161. *Geders v. United States*, 425 U.S. 80, 87 (1976); *see also* FED. R. EVID. 611.

3. *Comparison of Legislative and Judicial Proposals*

The most significant difference between the legislative proposal, which involves complete reform, and the judicial proposal, with an increased emphasis on Rule 706 is the degree to which co-opted experts would be eliminated from the trial. The legislative proposal would eliminate party-sponsored experts. In contrast, the judicial proposal permits party-sponsored experts, those who by definition are co-opted to some degree, to testify regardless of whether the court appoints an expert.

Additional differences do exist, but the important point to notice is the degree of similarity between these two proposals in addressing the problems with the current system of party-sponsored experts. Whatever the mechanism, the solution involves using more court-appointed experts and fewer party-sponsored ones. If a court faces a situation involving scientific evidence, and the court appoints an expert, greater truth and a fairer trial will surely result.

C. **Objections to Increased Court Appointment of Experts**

The two most obvious problems that the proposals present are (1) the possibility of judicial bias, and (2) the danger of the factfinder abdicating its role, that is, trial by expert.¹⁶² This section addresses each of these problems in turn.

1. *Judicial Bias*

Judicial bias¹⁶³ is a possible cost from implementing either of my two proposals. However, these proposals attempt to minimize and contain judicial bias. For instance, utilizing experts whom the parties have stipulated to before resorting to court-selected experts would eliminate judicial bias in all such cases.¹⁶⁴ Similarly, limiting partisan experts to highly controversial cases and in "best interest of justice" cases¹⁶⁵ would reduce the opportunity for judicial bias to substantially affect the result.¹⁶⁶ Finally, having the trial court create a record of its selection process, and including a list of the credentials and experience of each expert considered, would allow for meaningful appellate review of the selection process. Reversal of the trial result would be an appropriate remedy if bias affecting the outcome were discovered in the trial court's selection process.¹⁶⁷

162. What I mean by "trial by expert" is that a factfinder would abdicate all responsibility to ascertain independently the truth and would rely entirely upon the opinion of the expert. In other words, however the expert sees the problem, the jury will see it that way also.

163. The term "judicial bias" includes all types of favoritism that a court could show—for example, a judge might pick an expert who he knew would tend to favor one side over the other, or he might not allow an expert to testify at all on a certain subject. For an example of a judge affecting the outcome of a trial by his restriction of expert testimony see *Wood v. Stihl, Inc.*, 705 F.2d 1101 (9th Cir. 1983).

164. See *supra* text accompanying notes 116-141.

165. Criminal cases are the most likely example of when party-sponsored experts would be used with the legislative proposal, because this would be in the best interests of justice. See *supra* note 130.

166. See *supra* notes 130-135 and accompanying text.

167. Interlocutory appeals might also be used, and may be preferable as a means of preserving judicial resources. Obviously, either type of appeal would benefit from a full record of the selection process.

These safeguards do not completely eliminate the possibility of judicial bias, but they do contain it within acceptable boundaries. Comparing this bias with the flagrant abuses that occur everyday from the use of party-sponsored experts, possible judicial bias seems like the preferable risk for our society to run.

2 Trial by Expert

Trial by expert¹⁶⁸ remains a danger with both proposals. However, using only one expert at least removes the "showmanship" emphasized by the current system of party-sponsored experts.¹⁶⁹ The jury would decide the case on the substance of the expert's testimony rather than her polite ways or humorous manner. The attorneys have the chance to question the expert's views and can argue a more partisan view to the jury. In a case in which a crucial issue turns on a scientific question, having the most informed experts testify in a manner that best approaches the truth of the situation is more important than any concern about how much deference the jury would give to the expert. The party-sponsored system of experts also carries with it the risk of trial by expert. The possibility of trial by expert would be higher under the two proposals, but this risk is outweighed by the superior truth-seeking ability of the proposals. In addition, one should not underestimate the ability of lay people to cut through technocratic jargon and the truth of a situation.¹⁷⁰ The questioning atmosphere of a courtroom helps keep a jury from accepting *carte blanche* anything that is said. So while trial by expert is a danger, the benefits of using only one expert outweigh the dangers.

CONCLUSION

This Comment suggests two possible new treatments of scientific experts. The legislative proposal, a modified version of Rule 706, would require parties to negotiate for the appointment of a single expert for each subject area which requires expert testimony. The court would remain involved in the negotiations and could appoint the expert if the negotiations fail to produce an agreed-upon expert. In special circumstances, the court could permit each party to call its own expert, setting up the classic battle of the experts.

The legislative proposal's move away from the traditional workings of the adversary system may meet serious resistance from those steeped in adversarial traditions and stratagems. But before rejecting this proposal, it is worth considering its benefits. Higher degrees of objective truth are possible when one frees

168. See *supra* note 162 (defining trial by expert).

169. See Peck, *Impartial Medical Testimony*, 22 F.R.D. 21, 22 (1958) ("The witness with the cultivated courtroom manner, rather than with the superior knowledge and greater integrity, may make the best appearance and carry the jury.").

170. Imwinkelried, *supra* note 15, at 566-70; see also Doyle, *Applying Lawyers' Expertise to Scientific Experts: Some Thoughts About Trial Court Analysis of the Prejudicial Effects of Admitting and Excluding Expert Scientific Testimony*, 25 WM. & MARY L. REV. 619, 636-37 (1984); F.H. HARE, *MY LEARNED FRIEND: MEMORIES OF A TRIAL LAWYER* 99-100 (1976) ("war story" about the ability of a jury to evaluate expert testimony using common sense).

the expert to think independently of a cause or side. Naturally, the expert's testimony comes in the context of a concrete legal dispute that is bound to color the expert's opinions. Cross-examination style questioning, however, should highlight to the factfinder any biases or assumptions of the expert.

The judicial proposal attempts to solve the same problems as the legislative proposal does, and in so doing creates the same dilemmas. This proposal urges judges, through their power to control a case, to emphasize the use of court-sponsored experts, while minimizing the use of party-sponsored experts. This differs from the legislative proposal that would allow the use of party-sponsored expert witnesses only in cases that involve highly controversial areas of science or when in the best interests of justice.

The importance of knowing the truth of scientific situations will become even more important as our society becomes more dependent upon technology. As a people we must demand the best of our largest institutional dispute resolution system—the courts. To do so we need to free our best and brightest minds to think like experts. Intuitive understanding and independence of thought, those qualities crushed by the party-sponsored expert system, need to be reintroduced to the courtroom. We need to release the greatest asset of humanity—the human mind. As Blaise Pascal said: “mathematicians wish to treat matters of intuition mathematically, and make themselves ridiculous. . . . The mind. . . [works] tacitly, naturally, and without technical rules.”¹⁷¹

171. B. Pascal, *Pensees*, in *THE PROVINCIAL LETTERS, PENSEES, SCIENTIFIC TREATISES 171-72* (W.F. Trotter trans., W. Benton ed. 1952) (1670).

BOOK REVIEW

NATIONAL SECURITY ON THE HIGH FRONTIER

SPACE AND NATIONAL SECURITY

by Paul Stares

Published by The Brookings Institution, Washington, D.C., 1987

Pp. xvii, 219; \$10.95.

Reviewed By GLENN HARLAN REYNOLDS †

Over the past few years, for a variety of political and technical reasons, considerable attention has been focused on issues of space policy, both civilian and military. Although issues relating to civilian programs have not been ignored, the Reagan Administration's keen interest in all matters military has resulted in an explosion of interest in space militarization, and particularly in so-called "active" military uses of outer space, such as antimissile and antisatellite systems.

One of the analysts who has contributed the most to the discussion of space militarization over the last few years is Paul Stares of the Brookings Institution. With his latest work, *Space and National Security*,¹ Stares has produced an admirable successor to his previous work, *The Militarization of Space: U.S. Policy, 1945-84*.² The earlier book provided a comprehensive and well-documented history of United States military space policy from its first days; Stares' new book looks in great detail at the current U.S./Soviet military space situation, with primary emphasis on the possibility that the two nations will begin making realistic preparations for attacks on one another's satellites.

The threat of space militarization, including the use of satellites for military purposes and the possibility of attacks on satellites in response to those uses, has been addressed before by journalists, military experts, and members of the arms control and international law communities.³ Stares' coverage of the

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1. P. STARES, *SPACE AND NATIONAL SECURITY* (1987).

2. P. STARES, *THE MILITARIZATION OF SPACE: U.S. POLICY, 1945-84* (1985) [hereinafter *MILITARIZATION*].

3. See, e.g., W. BURROWS, *DEEP BLACK: SPACE ESPIONAGE AND NATIONAL SECURITY* (1986); D. RITCHIE, *SPACEWAR* (1982); Bunn, *Satellites for the Navy: Shielded by Arms Control?*, *NAVAL WAR C. REV.*, Sept.-Oct. 1985, at 55; Gravatt, *Elements for Conventional War—Land, Sea, Air and Space*, *NAVAL WAR C. REV.*, May-June 1985, at 2; Jasentuliyana, *Arms Control in Outer Space: A Review of Recent United Nations Discussions*, 9 *ANNALS OF AIR & SPACE L.* 329 (1984).

subject in the context of antisatellite (ASAT) weapons is, however, by far the best to date; in fact, it closely approaches the ideal for Washington policy analysis—though that virtue, as I will discuss further on, is not without certain accompanying vices.

The antisatellite issue has erupted into prominence as the result of a combination of technical and political developments. Antisatellite weapons are not new: the United States developed a rudimentary antisatellite capability in the 1960s, and maintained it (though at a low level of readiness toward the end) until the mid-1970s, while the Soviets started a bit later and (though they have proceeded slowly) never entirely abandoned their program.⁴ Now, however, advances in guidance and detection capabilities make "kinetic-kill vehicles" (those which destroy their targets through force of impact) and various laser and particle beam weapons practical.⁵ Meanwhile United States enthusiasm for eventual deployment of antimissile systems via the Strategic Defense Initiative has encouraged American efforts to prove much essential antimissile technology through development of ASAT systems, while American dependence on a relatively small number of vulnerable satellites for military purposes has encouraged the Soviet Union to work at developing the ability to attack those satellites.

Stares provides a detailed and accurate description of the current state and likely near-term future of United States and Soviet antisatellite capabilities, along with considerable detail regarding both the characteristics of various satellites likely to be targets of ASAT systems, and the different ways of interfering with those satellites. Military uses of satellites include reconnaissance (which may encompass photography, electronic intelligence, resource and crop estimates, etc.), early warning, command, control, and communications. Modern military forces in both the United States and the Soviet Union have become steadily more dependent on satellites for all of these functions, increasing the temptation for an adversary to deny them those capabilities by attacking the satellites that provide them. This temptation may be strong. Absent communications satellites, military units might be left paralyzed, unable to move without the necessary orders or information; absent reconnaissance and early warning

4. MILITARIZATION, *supra* note 2, at 106-55.

5. While there remains considerable debate about the effectiveness of such weapons as part of a "Star Wars"/SDI system, there is general agreement that the technology is up to the requirements of an antisatellite system. Although the basic technologies of antisatellite and antimissile systems are similar, as Stares notes, the challenges are of very different orders of magnitude. P. STARES, *supra* note 1, at 181-82. An antisatellite system, which must track and engage only a few targets moving over predictable paths (satellite orbits being very regular), has a much easier task than an antimissile system, which must deal with thousands of targets moving over short and unpredictable paths. See Hammond, *The Militarization of Space*, in INTERNATIONAL SPACE POLICY: LEGAL, ECONOMIC, AND STRATEGIC OPTIONS FOR THE TWENTIETH CENTURY AND BEYOND 235, 240-42 (D. Papp & J. McIntyre eds. 1987); Weiner, *Systems and Technology*, in BALLISTIC MISSILE DEFENSE 49, 54-63 (A. Carter & D. Schwartz eds. 1984). For more on the basic principles behind military and civilian uses of space see generally U.S. AIR FORCE, SPACE HANDBOOK (C. Cochran, D. Gorman & J. Dumoulin eds. 1985) (outlining orbital mechanics, various aspects of space technology, and U.S. military space doctrine); G. REYNOLDS & R. MERGES, OUTER SPACE: PROBLEMS OF LAW & POLICY (forthcoming from Westview Press).

satellites, commanders might be vulnerable to surprise attack or deception, or simply less able to deal with the hazards and opportunities of battle.⁶

Although satellites are not especially easy to attack, due to their high altitude and extreme speed, they are far from invulnerable. Because of their extreme speed, satellites may be destroyed simply by collision with relatively small amounts of inert matter, meaning that a handful of gravel lofted into the path of a multimillion dollar satellite can reduce that satellite to fragments. Satellites are also highly dependent on ground controllers for instructions (*e.g.*, on what to photograph) and maintenance (such as orbital correction, software modifications, etc.), meaning that interference with communications via jamming (or destruction of ground stations) can put otherwise intact satellites out of action. And satellites can be injured or destroyed by the electromagnetic pulse from a high-altitude nuclear explosion, or by laser beams or highly-concentrated microwave radiation that can damage their sensors or solar panels. As Stares reports, all of these techniques (as well, no doubt, as some others) are under examination by American and Soviet researchers. Stares' explanation of various antisatellite techniques is lucid and succinct and even those who are generally knowledgeable about the subject are likely to find it useful.⁷

After an examination of existing American and Soviet satellite systems,⁸ along with a discussion of current and planned antisatellite systems, Stares proceeds to evaluate how useful such ASAT systems might be if actually put to use. The answer, surprisingly enough, is that such systems are not likely to be very useful at all. Even allowing for the highest credible effectiveness and the greatest imaginable number of launches per day, either side would require days to destroy all—or even most—of the other side's vital military satellites.⁹ Clearly, under such constraints, an all-out surprise attack on an opponent's satellites is out of the question.

Of course, even lacking the ability to denude an adversary of satellites, either side might attempt to obtain local advantage by attacking a limited number of satellites supporting a given area. But such attacks would likely be counter-productive, and would pose a strong risk of escalation. Attacking

6. P. STARES, *supra* note 1, at 45-72. For a discussion of military commanders' use of satellite capabilities see Rehtin, *The Technology of Command*, NAVAL WAR C. REV., Mar.-Apr. 1984, at 5, 7-25.

7. P. STARES, *supra* note 1, at 73-141.

8. As tends to be the case in the area of military space systems, information on the nature, number, and orbital location of such satellites is both highly classified and generally available from unclassified sources. For example, although the launch dates and orbital parameters of United States military satellites are classified at a very high level, that information (apparently very accurate) is available on a poster that can be purchased through the National Air and Space Museum and which is updated monthly by *Air & Space* magazine. See Marshall, *A Spy Satellite for the Press?*, 238 SCIENCE 1346, 1347 (1987).

9. P. STARES, *supra* note 1, at 94, 108. In the meantime, of course, the adversary could be expected to take defensive measures (such as moving satellites into new orbits) as well as more aggressive steps such as attacking the ASAT facilities in question. The Soviet system, which requires a rocket launch (from a very limited number of launch sites) for each attack is more vulnerable than the current United States system, which uses missiles launched from specially-adapted F-15 fighters, but either would be a fairly "soft" target, and well worth attacking in order to prevent the loss of many crucial military satellites.

reconnaissance satellites before a surprise attack is itself a tip-off, and piecemeal attacks on adversary satellites invite retaliation in kind, do damage small enough that slack can be taken up by nonsatellite systems (like reconnaissance aircraft or landline communications), and might very well induce a nervous commander to fear that worse is to come, leading to an escalation of hostilities that might not be limited to outer space.¹⁰

Stares thus concludes that the real military usefulness of antisatellite weapons is much less than is commonly imagined.¹¹ Thus he recommends that the superpowers, rather than pursuing an ASAT arms race, enter into an arms control agreement limiting ASAT development, testing, or deployment.¹² He admits that "ASAT arms control cannot eliminate the threat to space systems, only bound it"¹³ — for example, existing ballistic missiles could be used to attack satellites, although at great expense, considerable risk of collateral damage to friendly systems, and with modest effectiveness—and there is (as with all treaties) always the possibility of outright cheating. But Stares says that, on balance, the benefits of an ASAT arms control regime outweigh the costs and the risks. Instead of attempting to deter Soviet ASAT attacks through our own buildup, we should negotiate a limit to the development of such weapons; then hedge our bets by taking steps to ensure the survivability of existing military space systems—both by "hardening" satellites against attack and by moving away from our current policy of dependence on relatively few multifunction satellites in favor of reliance on a larger number of simpler, one-function satellites that are both easier to replace and less attractive as targets.¹⁴

Finally, Stares recognizes that the constraints he proposes will inevitably limit the testing of antimissile systems as well. Because the technologies for intercepting satellites and missiles are virtually indistinguishable in all important respects (except for those relating to in point defense of missile silos, which involve interception of warheads after they enter the atmosphere), a ban on flight testing of ASAT systems or components will be likely to make much (if not all) SDI flight testing illegal as well. Similarly, since any conceivable space-based

10. P. STARES, *supra* note 1, at 136-39. Indeed, the mere existence of antisatellite capabilities may cause understandably nervous military commanders, and perhaps the civilians who oversee them, to fear the worst even if a satellite is lost accidentally at the wrong time. Space analyst Daniel Deudney has warned, quotably enough, that "The Archduke Francis Ferdinand of World War III may well be a critical U.S. or Soviet reconnaissance satellite hit by a piece of space junk during a crisis." Deudney, *Unlocking Space*, 53 FOREIGN POL'Y 91, 101 (Winter 1983-84). See also Reynolds, *Structuring Development in Outer Space: Problems of How and Why*, 19 L. & POL'Y INT'L BUS. 433, 444-45 (1987) (antisatellite weapons most destabilizing of space military systems).

11. As Stares puts it:

The situations in which dedicated ASAT weapons could be of some benefit to the United States appear to be confined to a narrow band on the conflict spectrum. . . . At lower levels of conflict, the risks of widening the crisis or war outweigh what are already doubtful military benefits, while the worth and relevance of ASAT attacks in a prolonged strategic nuclear exchange are questionable.

P. STARES, *supra* note 1, at 140-41. He concludes that ASATs are more likely to transform a crisis into a war, or to enlarge an existing war, than to confer any meaningful military advantage. *Id.*

12. *Id.* at 142-173.

13. *Id.* at 172.

14. *Id.* at 183-85. A shift by the Defense Department to a policy of using more and lighter satellites is also likely to provide a boost (in the form of increased demand and greater launcher flexibility) for the fledgling commercial space launch industry, which would be a valuable bonus.

antimissile system (and any ground-based system other than those designed for point defense) will unavoidably have antisatellite capabilities, any ban on ASAT deployment is likely to complicate deployment of antimissile systems.¹⁵ However, Stares notes that space-based SDI components would be highly vulnerable to attack by ASAT systems, so that ironically the SDI might well be impractical in the absence of constraints on ASAT systems.

As mentioned at the outset, Stares' book is a first-class example of what the Washington policy establishment can produce at its best. His explication is clear, accurate, and reasonably comprehensive, and his recommendations are sensible and follow logically from his analysis. These are the virtues of the policy-analysis approach to problems, but that approach has its vices as well. Chief among those vices is the need to stay within rather narrow bounds in order to be thought acceptable, practical, and suitably hard-headed. The problem is that the need to focus on what seems "practical" induces a sort of myopia, with political and technological forecasts based primarily on ready extrapolation from existing conditions.

Weathermen have an analog to this approach, which they refer to as the "persistence theory of meteorology"—all that is required is to look out the window, see what the weather is like, and assume that it will stay that way for a while. Such an approach is relatively accurate in the very short run, but of no use in the long run, whether one is forecasting the weather or international politics. For example, only a few years ago, the policy experts scoffed at the likelihood of an agreement on Intermediate Range Nuclear Forces in Europe, particularly one based on the so-called "double zero" option. Yet changes in the superpower climate, and in the attitudes of ordinary citizens and policymakers toward nuclear war—changes induced in no small part by those considered un-serious by the policy community—led to just that.

On a less dramatic plane, Stares treats the question of space militarization as one that involves only the United States and the Soviet Union. While that is largely true at the moment, several other countries—particularly India and Brazil—are on the verge of acquiring space capabilities great enough to support at least a modest ASAT system of the sort possessed by the United States in the late 1960s.¹⁶ Such countries have been known to acquire military capabilities

15. This is about as deep as Stares' legal discussion gets, but the book does not purport to be a legal analysis. For more on this topic, see Chayes, Chayes & Spitzer, *Space Weapons: The Legal Context*, 114 DAEDALUS 193 (1985); Note, *The Legality of Antisatellites*, 3 B.C. INT'L & COMP. L. REV. 467 (1980). See also R. GARTHOFF, POLICY VERSUS THE LAW: THE REINTERPRETATION OF THE ABM TREATY 1-15 (1987) (attacking Reagan Administration's "broad interpretation" of ABM Treaty as permitting flight testing of antimissile systems); *U.S.-Soviet Arms Accords Are No Bar to Reagan's Strategic Defense Initiative*, HERITAGE FOUND. BACKGROUNDER NO. 421 (1985) (stating Administration view).

16. See, e.g., Karp, *The Commercialization of Space Technology and the Spread of Ballistic Missiles*, in INTERNATIONAL SPACE POLICY, *supra* note 5, at 179, 182-88 (describing space programs of India, Brazil, and other third world countries as on verge of supporting military applications, which include ASAT and ballistic missile uses); Whitehouse, *Brazil Shows the Way*, SPACE, Mar.-Apr. 1987, at 4 (describing Brazilian space program, which includes acquisition of satellite design and launch capabilities, as a model for emerging third world space powers); Tefft, *The Chariot of Indra*, AIR & SPACE, Apr.-May 1988, at 33, 37-42 (describing India's progress in developing satellite launch capability, and goal of self-sufficiency in space). For that matter, the ingenious and capable Israeli aerospace industries might well be capable of duplicating the United States ASAT system and the

beyond what outside analysts consider to be their objective needs (e.g., India's nuclear capability) for reasons of prestige or in order to stand up to superpowers on other fronts, and might well consider doing so in the context of antisatellite weapons. This would create problems for the United States or the Soviet Union that would in some ways be greater than those presented by a U.S./Soviet ASAT arms race; it might be, for example, that a third world nation would not be deterred by the threat of retaliation against its own satellites, either because it had none, or because it depended on them less than more advanced nations. This offers a reason for an ASAT treaty including all space powers and not just the United States and the Soviet Union as Stares advocates.

Another such reason for limiting space militarization, also not addressed by Stares, is the discouraging effect it might have on commercial activity in outer space.¹⁷ Reflecting an unfortunate general trend, the militarization of space holds out no likelihood of actually protecting commercial space ventures from destruction—only the promise to wreak further destruction on an adversary, which is hardly a comfort to potential investors. In addition, the use (or even testing) of ASAT systems in space is likely to add to an already severe space debris problem that could make many near earth orbits dangerous or even unusable. Because of the very high velocities at which objects orbit the earth even small objects strike with enormous energy. Collision of a satellite with a golf ball-sized (about 4 cm.) fragment of material (whether an ASAT weapon or a piece of junk from prior experiments or actual attacks) can produce literally millions of fragments which, of course, continue to orbit and menace other satellites. At some level, such chain reactions become self-sustaining, yielding a "Kessler effect" in which satellites destroyed by fragments yield more fragments which destroy still more satellites.¹⁸ If this seems far-fetched, readers should

necessary modifications to F-15 fighters (already possessed by Israel) to operate it. This possibility might even become a likelihood if Arab nations were (say, in another Arab-Israeli war) to make use of Soviet intelligence satellite data—or to launch their own reconnaissance satellites—something not out of the question in coming years. Recent experience certainly indicates that space-related technology, in the form of Israeli-built "Jericho 2" missiles and Chinese-built CSS-2 missiles owned by Saudi Arabia (both of which are capable of carrying nuclear warheads) has been spreading to the Middle East, perhaps presaging a general third-world trend. See *Saudi Purchase of Chinese Missiles Changes Middle East Military Balance*, AVIATION WEEK & SPACE TECH., Mar. 28, 1988, at 30; see also *Brazil's Missile Capability Alarms CIA*, Washington Post, Mar. 28, 1988, at C14, col. 1 (describing Brazil's increasing capability in the ballistic missile field and fear that it would export missiles to unstable nations such as Libya and Iraq; analysts also believe that Brazil is pursuing its own nuclear weapons program). Less capable tactical missiles, of course, have played a part for some time in the so-called "war of the cities" between Iran and Iraq, a conflict that at this writing seems to be escalating and that lends credence to fears regarding third world use of ballistic missile technologies. See *Iraq Targets Bigger Missile on Tehran*, Washington Post, Mar. 28, 1988, at A17, col. 1. Prospects for reversal of this trend seem dim, at least in the absence of concerted action by both Western and non-Western nations. Even serious and concerted efforts by the existing space powers, though, will only slow the spread of such technology, not halt it.

17. For example, a desire to maintain a monopoly on space reconnaissance photography has led to the existence of regulations that threaten to cripple the United States' civilian remote sensing industry. See Reynolds, *The First Amendment and Satellite Newsgathering*, AIR & SPACE LAW., Fall 1987, at 1; Merges & Reynolds, *News Media Satellites and the First Amendment* (forthcoming in 3 HIGH TECH. L.J. 1988).

18. The effect is named after Kessler for his pioneering article on the subject. See Kessler & Cour-Palais, *Collision Frequency of Artificial Satellites: The Creation of a Debris Belt*, 83 J. GEOPHYSICAL RES. 2637 (1978).

bear in mind that already—*without* ASAT testing at anywhere near the levels that would take place in an all-out space arms race—the artificial debris flux in near earth orbits exceeds the natural meteorite flux.¹⁹ Serious testing of ASAT weapons, much less their use in combat, could thus have devastating effects on the potential for beneficial uses of space by nonmilitary ventures. Since it can take years, decades, centuries, or even longer at orbits more than a few hundreds of miles up for such debris to be removed by natural processes, the damage done could be virtually permanent, with incalculable impact on the future of mankind.²⁰

Aside from giving short shrift to the above issues, Stares' book pays no attention to the broader importance of man's activity in outer space, and how that could be used to steer superpower activities in more peaceful directions, at least within the context of outer space.²¹ Such a technique is not new: President Kennedy deliberately made use of civilian projects as a way of sidetracking military projects (including BAMBI—for Ballistic Missile Boost Intercept, a lineal ancestor of today's SDI—and SAINT, a satellite interception program) and promoting a general sense of space as a place for peaceful, not aggressive, endeavors.²²

This approach might profitably be used again. A solid commitment to civilian programs would also increase the likelihood that Stares' suggestions regarding military programs would be followed: although Stares makes a good case that ASAT is a bad idea, it is an idea from which some people stand to make money. Those people are thus likely to resist efforts to negotiate an ASAT arms agreement, but that resistance will be less vigorous (or at least counterbalanced) if such an agreement is to be followed by equally-lucrative civilian programs. Whether one calls this blatant interest-group bribery or simply good politics (assuming that there is a difference nowadays), it is hard to argue with, and the lessons should be obvious for those opposing space weapons programs in general. Stares, however, does not address it.

Leaving the pork barrel aside for a moment, bold civilian space programs could have a broader, more spiritual effect. Kennedy intended the moon race, a bloodless technological competition with the Soviet Union, to serve as a moral equivalent of war and it did—until, as Freeman Dyson has observed, it was eclipsed in the public mind by the real war in Vietnam, in which we were less

19. In the volume of space near earth, a satellite is more likely to collide with pieces of man-made objects (such as fragments from antisatellite tests or accidentally-exploded rocket boosters) than with naturally occurring meteors of the same size. See Kessler, *Earth Orbital Pollution*, in *BEYOND SPACESHIP EARTH: ENVIRONMENTAL ETHICS AND THE SOLAR SYSTEM* 47, 48-49 (E. Hargrove ed. 1986) [hereinafter *BEYOND SPACESHIP EARTH*].

20. For an interesting and up-to-date study of the orbital debris problem see David Enrico Reibel, *Prevention of Orbital Debris* (unpublished manuscript presented at IAF conference in Brighton, UK, October 10, 1987) (available from Glenn H. Reynolds). See also Johnson, *Preventing Collisions in Orbit*, *SPACE*, May-June 1987, at 17.

21. Others have addressed this topic. See, e.g., Deudney, *Forging Missiles into Spaceships*, 2 *WORLD POL'Y J.* 271 (1985) (arguing for cooperative projects in space to defuse superpower tensions); Reynolds & Merges, *The Role of Commercial Development in Preventing War in Outer Space*, 25 *JURIMETRICS J.* 130 (1985).

22. For more on President Kennedy's view of space see Reynolds, *Structuring Development in Outer Space: Problems of How and Why*, *supra* note 10, at 441-445 and sources cited therein.

successful.²³ More generally, the Apollo mission photographs of earth, showing our planet as a small, fragile object amid a sea of blackness and emptiness, did much to promote a view of our world as (significantly named) "spaceship earth" with consequences that have not yet been fully played out.²⁴ Gregg Easterbrook has proposed that the United States and the Soviet Union counter the fear of the future inspired by nuclear weapons with a measure of hope by engaging in cooperative ventures in outer space, to be financed by a one percent tax on the total of their defense budgets. At current levels that would yield about six billion dollars per year, enough for some substantial undertakings. As Easterbrook says, "If the venture reduced superpower tensions, it would surely do more to enhance United States national security than 1 percent more weaponry."²⁵ Easterbrook is right. The people of the world understand more clearly than their leaders—and most of those who advise them—that space represents the future of humanity, and that it should be a place of hope and aspiration, not simply a new arena for old conflicts. Leaders (and analysts) who understand this have an opportunity to make a real qualitative difference; those who do not will be consigned to picayune disputes about payload and sensor capabilities that, although important in the short run, offer no way out of the larger problems.

Stares' policy proposals should thus go beyond the "quick fixes" necessary to deal with the direct aspects of the problem and address some of the larger issues. Nonetheless, they are good proposals, based on good analysis. If the space policy field had more analysts of Stares' caliber, and more works like *Space and National Security*, it might be that our national leaders would have the wherewithal to act on a broader vision than Stares' book itself contains. Unfortunately, that vision is nowhere apparent today, and we are all the worse off for that.

23. See F. DYSON, *WEAPONS AND HOPE* 219 (1984).

24. See Hartmann, *Space Exploration and Environmental Issues*, 6 ENVTL. ETHICS 227-39 (1984), reprinted in *BEYOND SPACESHIP EARTH*, *supra* note 19, at 119-20.

25. Easterbrook, *Getting Back Into Space: 12 Cheap and Easy Ways*, *Washington Post*, Aug. 23, 1987, at B1, col. 4.

LEGISLATIVE UPDATE

INTRODUCTION

Legislative Update is a survey of recent state legislation relating to various aspects of high technology.¹ The survey is comprised of brief summaries of new state laws grouped under appropriate topic headings and listed thereafter alphabetically by jurisdiction. Each summary ends with a citation to the new law.

Although *Legislative Update* includes a broad selection of new technology related legislation, it is not intended to be comprehensive. In addition, the summaries do not mention aspects of the new laws that do not address high technology issues.

I. BIOTECHNOLOGY

California A biotechnology clearinghouse and referral service has been added to the Office of Business Development of the Department of Commerce to provide the public with information on biotechnology research, regulations, product development, and policy issues. The clearinghouse and referral service will end January 1, 1992 unless extended by the legislature. Act of Sept. 17, 1987, ch. 711, 1987 Cal. Leg. Serv. 963 (West) (codified at CAL. GOV'T CODE § 15333 (West Supp. 1987)).

II. HIGH TECHNOLOGY AND CRIME

A. Computer Crime

Arkansas It is now a felony to access a computer to extort or fraudulently obtain money, property, or services. It is a misdemeanor of computer trespass to access, damage, or disrupt a computer, program, or data without authorization. Persons injured by these offenses may recover any damages sustained, including loss of profits. An action under this statute must be brought within three years from the date the alleged violation is discovered or should have been discovered. Act of Apr. 13, 1987, 1987 Ark. Acts 908

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1. *High Technology Law Journal* wishes to thank Information for Public Affairs of Sacramento, California for providing us with access to their comprehensive computerized database of state legislation.

(codified at ARK. STAT. ANN. §§ 5-41-101 to -107 (Supp. 1987)).

- California It is now a crime for any person to knowingly and wrongfully access a computer network or system, make use of computer data or services, disrupt computer services, or assist in such conduct. A person convicted under these provisions may also be liable for compensatory damages in a civil action. Comprehensive Computer Data Access and Fraud Act, ch. 1499, 1987 Cal. Legis. Serv. 853 (West) (codified as amended at CAL. PENAL CODE § 502 (West 1987) and codified at CAL. WELF. & INST. CODE § 653.1 (West 1987) and codified as amended at CAL. WELF. & INST. CODE § 653.5 (West Supp. 1988)).
- Florida It is now a crime to use communication technology in furtherance of a scheme to defraud. A scheme to defraud includes attempts to obtain property under false pretenses. Communication technology is broadly defined to include transfer by mail, wire, radio, electromagnetic, photo-electronic, or photo-optical systems. Separate judgments and sentences may be imposed for attempts to obtain property and for acts which result in obtaining property. Status as a felony or misdemeanor is based on the value of the property obtained or endeavored to be obtained. Florida Communications Act, ch. 382, 1987 Fla. Sess. Law Serv. 697 (West) (to be codified at FLA. STAT. ANN. § 817.034) (West Supp. 1987) and repealing FLA. STAT. ANN. §§ 817.035, .036 (West 1978)).
- Illinois It is now a misdemeanor to knowingly and without authorization access a computer, program, or data. This offense will be increased to a felony if the person who commits the crime: (1) damages a computer or alters computer programs or data; (2) causes disruption of vital government or public utility services; (3) creates a strong probability of death or great bodily harm; or (4) defrauds any person or entity. Computer Crime Prevention Law, 1987 Ill. Legis. Serv. 319 (West) (to be codified as amended at ILL. ANN. STAT. ch. 38, paras. 16D-1 to D-7 (Smith-Hurd 1987) and repealing ILL. ANN. STAT. ch. 38, para. 16-9 (Smith-Hurd 1961)).

Missouri Three types of computer crime have been established, and they involve tampering with (1) computer data, (2) computer equipment, and (3) computer users. Tampering with computer data is defined as knowingly modifying, destroying, or disclosing computer data, programs, or passwords without authorization. This crime constitutes a misdemeanor. However, if the accused acted with intent to defraud and the property is valued at \$150 or more, the crime is a felony. Tampering with computer equipment is defined as modifying or destroying computer hardware without authorization. This crime also has a graduated system of penalties based on intent to defraud and on the amount of damage. Tampering with computer users is defined as gaining unauthorized access to a computer system or denying access to authorized users. This section provides both civil and criminal remedies including compensatory damages and attorney's fees. Act of July 14, 1987, 1987 Mo. Laws 905 (codified at MO. ANN. STAT. §§ 569.093, .095, .097, .099 (Vernon Supp. 1988) and repealing MO. ANN. STAT. §§ 569.093, .095, .097, .099 (Vernon 1986)).

North Dakota The offenses of computer fraud and computer crime have been redefined as attempting or gaining access to a computer system to use, alter, or destroy the information with intent to defraud. The penalty was reduced from a maximum 10 years and \$10,000 to 5 years and \$5,000. Computer crime has also been redefined to include any acts to gain unauthorized access to computer systems or software. The penalty for this crime was reduced from a felony to a misdemeanor. Act of Jan. 6, 1987, ch. 164, 1987 N.D. Sess. Laws 401 (codified at N.D. CENT. CODE §§ 12.1-06.1-01, 12.1-06.1-08 (1987)).

B. High Technology and Criminal Investigations

Hawaii A computerized fingerprint identification system will be established in the state criminal justice data center. The attorney general will coordinate the system with federal, state, and county law enforcement agencies. The system will increase the speed and accuracy of criminal investigations and enhance cooperative efforts among these law enforcement agencies. Act of July 7, 1987, 1987 Haw. Sess.

Laws 1206 (to be codified at HAW. REV. STAT. § 846 (1987)).

Washington

Automatic fingerprint identification systems used by local law enforcement agencies must now be compatible with the Washington state system. The local agencies must be able to transmit and receive data as well as answer inquiries from the state system. Local agencies that contracted for an automatic fingerprint identification system prior to Jan. 1, 1987 are exempt from this requirement, but the State Patrol may charge fees to process fingerprints from those jurisdictions. Act of May 18, 1987, ch. 450, 1987 Wash. Laws (codified at WASH. REV. CODE §§ 10.98.050, 13.50.050, 26.44.050, 43.43, .735, .740, .742 (1987)).

C. Protection of Trade Secrets

Alabama

It is now an offense to disclose or use trade secrets when discovered by improper means or by a breach of confidence. Liability is imposed when a party knew or should have known that the information was a trade secret. Available remedies include: injunctive or equitable relief, actual damages, reasonable attorney's fees to the prevailing party when a claim is either made or resisted in bad faith, and exemplary damages if the misappropriation was willful and malicious. Recovery is allowed for any profits or benefits attributable to the misappropriation. The plaintiff need only present proof of the misappropriator's gross revenue. This Act is the civil alternative to § 13A.8-10.4 which makes stealing, copying, communicating, or transmitting a trade secret a felony. Alabama Trade Secrets Act, 1987 Ala. Acts 1195 (codified at ALA. CODE §§ 8-27-1 to -6 (Supp. 1987)).

Idaho

The definition of trade secrets protected under the Idaho Trade Secrets Act has been expanded to include computer programs. The purpose of the Act is to protect computer software from pirating. Injunctive relief or damages may be sought for violation of the Act. Act of Mar. 23, 1987, ch. 67, 1987 Idaho Sess. Laws 121 (to be codified as amended at IDAHO CODE §§ 648-801 (1987)).

- Illinois The Illinois Trade Secrets Act provides relief for misappropriation of trade secrets. The remedies available include injunctions against actual or threatened misappropriation as well as damages. Damages can include both actual loss and unjust enrichment. An action for misappropriation must be brought within five years after the misappropriation is or should have been discovered. The Act does not apply to misappropriation occurring prior to its Jan. 1, 1988 effective date. Illinois Trade Secrets Act, 1987 Ill. Legis. Serv. 38 (West) (to be codified at ILL. ANN. STAT. ch. 140, paras. 351 to 359 (Smith-Hurd 1987)).
- Minnesota Courts may now impose injunctions allowing future use of a misappropriated trade secret upon payment of a reasonable royalty. These injunctions may be issued when there is a material and prejudicial change of position by the misappropriating party prior to knowing, or having reason to know, of the misappropriation. The plaintiff is entitled to damages except to the extent the defendant materially changed position before he had reason to know of the misappropriation. Act of Jan. 20, 1987, ch. 1, 1987 Minn. Sess. Law Serv. 1 (West) (codified as amended at MINN. STAT. ANN. §§ 325C.02, .03, .07 (West Supp. 1988)).
- Oregon The Uniform Trade Secrets Act authorizes recovery of damages for misappropriation of trade secrets. Under the Act, actual or threatened misappropriation of trade secrets may be enjoined. In addition, damages can be awarded for both the actual loss and the unjust enrichment caused by misappropriation. An action must be brought within three years after the misappropriation is or should have been discovered. The Act does not apply to misappropriations occurring prior to its Jan. 1, 1988 effective date. Act of Apr. 20, 1987, ch. 537, 1987 Or. Laws 1007 (to be codified at OR. REV. STAT. §§ 646.1 to -.12 (1987)).
- Virginia The Uniform Trade Secrets Act has been adopted to deter the misappropriation of trade secrets. Any actual or threatened misappropriation of a trade secret may be enjoined for the life of the trade secret. Damages can be awarded for both actual loss and unjust enrichment. An action for misappropriation must be brought within three years after the alleged misappropriation is or should have been discovered. Uniform Trade Secrets Act, ch. 210, 1986 Va. Acts 262 (codified at VA. CODE ANN. §§ 59.1-336 to -343 (1986)).

D. Proprietary Rights

Illinois The Software License Enforcement Act is repealed. The Act was designed to protect against the unauthorized use of computer software by providing for binding agreements between purchasers of retail software and software publishers. Act of Sept. 20, 1987, 1987 Ill. Legis. Serv. 19 (West) (repealing (ILL. ANN. STAT. ch. 29, paras. 801-08 (Smith-Hurd 1987))). For a complete summary of the Software License Enforcement Act, see *Legislative Update*, 1 HIGH TECH. L.J. 223-24 (1986).

E. Electronic Surveillance, Databases and Privacy

Georgia Public records containing certain trade secrets and proprietary information will be exempt from inspection. These exemptions do not apply to information that has been publicly released, published, copyrighted, or patented. Act of Apr. 2, 1987, 1987 Ga. Laws 377 (to be codified as amended at GA. CODE ANN. § 50-18-72 (1987)).

Montana Department heads of state agencies must assure adequate security for all information technology resources within their department. Information technology resources have been defined to include all computer hardware, software, and electronically stored data. Act of Apr. 23, 1987, ch. 592, 1987 Mont. Laws 1522 (to be codified as amended at MONT. CODE ANN. § 2-15-102 (1987)).

III. TECHNOLOGY AND DEVELOPMENT

A. Technology Transfer and Intellectual Property

Texas The Commissioner of Higher Education will review the intellectual property policies of Texas colleges and universities. The review will insure that the policies set minimum standards regarding disclosure of developments, licensing guidelines, identification of ownership and licensing responsibilities, royalty participation, and equity and management participation by those who utilize technology created at the institution. A copy of each institution's policies will be filed with the Coordinating Board of the Texas College and University System. If an institution fails to comply, it will not receive any funds from state-run competitive research or advanced technology funding programs. Act of June 19, 1987, ch. 772, 1987 Tex. Sess. Law

Serv. 5504 (Vernon) (codified as amended at TEX. EDUC. CODE ANN. § 51.680 (Vernon 1987)).

Texas An employee of a state college or university who develops intellectual property may now be awarded an equity interest in, or serve as a director of, a private business that is researching, developing, licensing, or exploiting that intellectual property. A state college or university with an ownership interest in intellectual property may appoint an individual to serve on the board of any business entity that has an agreement with the state regarding the exploitation of the intellectual property. Act of June 20, 1987, ch. 845, 1987 Tex. Sess. Law Serv. 5842 (Vernon) (codified as amended at TEX. EDUC. CODE ANN. § 51.912 (Vernon 1987)).

Virginia The State Council of Higher Education for Virginia will develop patent and copyright policy guidelines for state-supported colleges and universities. All employees of state-supported institutions of higher education will be bound by these patent and copyright policies. Act of Apr. 1, 1986, ch. 358, 1986 Va. Acts 590 (codified at VA. CODE ANN. §§ 23-4.3, -4.4, -9.10:4 (Supp. 1987)).

B. Technology and Government Agencies

Louisiana The Louisiana Department of Commerce will establish a clearinghouse for information relating to informal risk capital investment opportunities in new or emerging business ventures. The clearinghouse will compile current information describing opportunities for risk capital investment from fifty thousand to five hundred thousand dollars. This statute is designed to stimulate the growth of small business by improving the transfer of information between potential investors and entrepreneurs. Venture Capital Network Law, 1987 La. Acts 29 (to be codified at LA. REV. STAT. ANN. §§ 51:1141 to :1146 (West 1987)).

Nebraska The Department of Economic Development will set up a venture capital network to act as a clearinghouse for information relating to capital investment opportunities in the range of fifty thousand to five hundred thousand dollars. The Network will disseminate information about potential investors to subscribers for a reasonable fee. This law is designed to attract new small businesses and capital to the

state. Act of May 29, 1987, 1987 Neb. Laws 479 (codified at NEB. REV. STAT. §§ 81-1265 to -1271 (1987)).

New Jersey

The New Jersey Commission on Science and Technology has been allocated more than \$30 million to establish a network of advanced technology centers at colleges and universities. The appropriation will fund construction of advanced technology centers in the fields of biotechnology, medicine, food technology, hazardous and toxic substance management, and industrial productivity. Act of June 5, 1986, ch. 52, 1986 N.J. Sess. Law Serv. 68 (West) (codified at N.J. STAT. ANN. § 18A:64J (West Supp. 1987)).

New York

The authority of the New York State Science and Technology Foundation has been expanded to include the area of automation and robotics. The Foundation is authorized to fund technology centers by matching private funding. The Foundation was originally created to encourage scientific and technological education, promote cooperation between the government and private sector in research and development, and foster development of new products. Act of Aug. 7, 1987, ch. 828, 1987 N.Y. Laws 1574 (codified as amended at N.Y. PUB. AUTH. LAW § 3102-a (McKinney Supp. 1988)).

Oklahoma

The Oklahoma Department of Commerce will assist inventors by providing a full range of services including patent searches, business counseling, and help in obtaining financing. In exchange for its assistance, the Department of Commerce will require a \$100 application fee and will receive a ten year, 7.5% royalty on products sold. The inventor must conduct all stages of business in Oklahoma to the extent feasible. Income from the sale of products shall be exempt from state income tax for the first 7 years of sales. Inventors Assistance Act of 1987, 1987 Okla. Sess. Law Serv. 507 (West) (to be codified at OKLA. STAT. tit. 74, §§ 5061 to 5069 (1987)).

Oregon

The Software Industry Development Council has been established to advise the Economic Development Department and the Economic Development Commission on the software industry in Oregon. This law is designed to promote the growth and success of the software industry by identifying opportunities for growth as well as barriers to success. Act of May 28, 1987, ch. 198, 1987 Or. Laws 326

(to be codified at OR. REV. STAT. §§ 184.001 to .198 (1987)).

Texas

The Texas Center for Superconductivity will be established at the University of Houston to conduct research on superconductivity, including experiments as well as transfer of new technology to the marketplace. The center also will coordinate activities among other research centers, contract with private research entities, act as a resource center, seek funds from private and federal sources, and establish an advisory council. The center will be initially funded from amounts received by the state in the settlement agreement of *In re The Department of Energy Stripper Well Exemption Litigation*, 578 F.Supp. 586 (D. Kan. 1983). Act of June 20, 1987, ch. 95, 1987 Tex. Sess. Law Serv. 6405 (Vernon) (codified at TEX EDUC. CODE ANN. §§ 111.100 to .107 (Vernon 1987)).

C. Technology Incentives

Hawaii

The output from a state subsidized wind energy farm must be made available to the general public through the sale of the energy to the Hawaii Electric Light Company. Act of Apr. 6, 1987, 1987 Haw. Sess. Laws 16 (to be codified as amended at HAW. REV. STAT. §§ 39A-151 to -171 (1987)).

Illinois

Electric utilities are required to enter into long-term contracts to purchase electricity from qualified solid waste energy facilities. These electric utilities will be entitled to tax credits for the amount by which the cost of such electricity exceeds the cost of electricity from traditional sources. This law is designed to conserve energy resources by encouraging the development of alternative energy production facilities for the disposal of solid waste. Act of Sept. 11, 1987, 1987 Ill. Legis. Serv. 22 (West) (to be codified at ILL. ANN. STAT. ch. 111 2/3, paras. 8-403.1, 9-215.1 (Smith-Hurd 1987)).

Texas

A special fund has been created to attract the National Center for Manufacturing Sciences to the state. The fund will consist of appropriations and grants from industry and other sources. Every two years, the legislature may match up to \$2 million of the amount received from private donations. The fund will be available to the Center once it locates in Texas. The legislature concluded that the high technology research and development center would improve the health of the Texas manufacturing sector. Act of

Apr. 29, 1987, ch. 44, 1987 Tex. Sess. Law Serv. 155 (Vernon) (codified as amended at TEX. EDUC. CODE ANN. § 51.701 (Vernon 1987)).

IV TELECOMMUNICATIONS

- Colorado Flexible regulatory treatment for various intrastate telecommunications services has been adopted. All basic service providers must obtain a certificate of public convenience and necessity. The certificate gives the provider an exclusive grant or monopoly, subject to regulation as a public utility by the Commission. Emerging competitive telecommunications services are subject to regulation by the Commission unless the Commission determines that deregulation would be in the public interest. Emerging competitive telecommunications services include: advanced features, private line service, InterLATA toll, and switched access. Exempt from Commission regulation are other products and services such as cable services, cellular telecommunications devices, mobile radio services, radio paging, informational services, and new products and services not necessary to provide basic exchange service. Act of July 2, 1987, ch. 313, 1987 Colo. Sess. Laws 1336 (codified as amended at COLO. REV. STAT. §§ 40-15-1 to -15-4 (1987)).
- Minnesota Regulation of certain telephone services is now determined by the classification of the service. The three possible service categories are: (1) noncompetitive, (2) effective competition, and (3) emerging competition. A telephone company may not discontinue or change the rates of any noncompetitive service without express approval of the State Utilities Commission. The Commission must approve the classification as effective or emerging competition, and the telephone company has the burden of establishing that competition exists. Rates for emerging competition service may be raised only with notice to customers and Commission approval. Rates for effective competition service may be raised simply upon notice to customers. Act of June 1, 1987, ch. 340, 1987 Minn. Sess. Law Serv. 49 (West) (codified at MINN. STAT. §§ 237.51-.66 (1987) repealing MINN. STAT. §§ 237.13, .41, .42, .43; and amending MINN. STAT. §§ 237.01, .081, .11, .12, .16, .17, .22 (1986)).

Missouri Telecommunications companies and their business practices are now regulated by the Missouri Public Service Commission. Act of July 17, 1987, 1987 Mo. Laws 834 (codified at MO. ANN. STAT. §§ 386.020 to 392.530 (Vernon 1988) (repealing MO. ANN. STAT. §§ 386.020 to 392.360 (Vernon 1986))).

V. CONSUMER PROTECTION AND ELECTRONICS

A. Sales Using Electronic Equipment

California This Act exempts computerized data from the Electronic Commercial Services Act, which requires the provider of electronic shopping services to give customers specific information regarding charges and complaints. Act of June 17, 1987, ch. 49, 1987 Cal. Legis. Serv. 27 (West) (amending CAL. CIV. CODE § 1789.2 (West Supp. 1988)).

Georgia A comprehensive regulatory scheme will now govern the use of any device used to automatically dial telephone numbers and disseminate prerecorded messages ("ADAD equipment"). Users of ADAD equipment are required to obtain a permit from the Public Service Commission. Users must meet certain requirements before using ADAD equipment for advertising or offering consumer goods or services, conducting polls or soliciting information. For example, the ADAD equipment user must obtain prior consent from the individual consumer, calls must be made between 8:00 AM and 9:00 PM, random and sequential dialing cannot be used, and the recorded message must state the name and telephone number of the call's initiator. It is unlawful for ADAD equipment to be used by a non-profit organization, or for debt collection. Act of Apr. 16, 1987, 1987 Ga. Laws 1159 (to be codified at GA. CODE ANN. § 46-5-23 (1987)).

B. Sales and Warranties of Electronic Equipment

Hawaii Computer retailers are now required to provide purchasers with written disclosure regarding the removal or replacement of parts from the computer as received from the manufacturer. The disclosure must be printed in eight-point type-size or larger. This law is designed to protect the public from buying inferior equipment and paying for unnecessary repairs. Act of May 29, 1987, 1987 Haw.

Sess. Laws 129 (to be codified at HAW. REV. STAT. § 481B (1987)).

VI. TECHNOLOGY AND GOVERNMENT SERVICES

A. Technology and Education

Nebraska All teacher training programs are now required to instruct participants on the use and benefits of information technologies in the classroom. Technologies include computers, film, videodiscs, and instructional television. Act of Apr. 6, 1987, 1987 Neb. Laws 1440 (codified at NEB. REV. STAT. § 79-12,153 (Supp. 1987)).

B. Technology for State Agencies

California The Office of Emergency Services will establish a State Computer Emergency Data Exchange Program (SCEDEP) for the collection and dissemination of essential data for emergency management. SCEDEP will develop a program for improved communication of emergency information between appropriate statewide entities. Act of Sept. 30, 1987, ch. 1451, 1987 Cal. Legis. Serv. 488 (West) (codified at CAL. GOV'T. CODE §§ 8589.1, .2 (West Supp. 1988)).

Colorado The Commission of Information Management has been created to replace the Division of Automated Data Processing. The Commission will oversee strategic planning and set policy for state information systems. The Commission's responsibilities include preparing a strategic data processing plan, studying data processing needs, setting minimum standards to control purchases and acquisitions of information systems by state entities, and achieving state-wide compatibility of information systems. Act of July 11, 1987, ch. 175, 1987 Colo. Sess. Laws 246 (codified as amended at COLO. REV. STAT. §§ 24-30-1701 to -1704, 2-2-320(2), 24-1-116, 24-30-1603(1)(a), (d), 24-30-1606(1), 24-102-101 (1987) and repealing COLO. REV. STAT. ANN. §§ 24-1-116(2)(d), 24-30.6 (1982)).

New Hampshire An Automated Information Systems Board has been established to advise the Commissioner of Libraries on statewide policies, coordinate local systems, and make long-range plans. Act of May 18, 1987, ch. 224, 6 N.H. Laws

224 (codified as amended at N.H. REV. STAT. ANN. § 201-A:24 (1987)).

Washington

The Information Services Board and the Department of Information Services will replace the Data Processing Authority in order to respond to changing technology and increasing demands for information systems. The Board's primary duties are to set policies, guidelines, and standards for state information services. The Department is the working arm of the Board and its duties include providing information services to state agencies and local governments, establishing rates and fees, developing plans for training and development, and providing support staff for the Board. In addition, a data processing revolving fund has been created for acquiring information system technology. Act of May 19, 1987, 1987 Wash. Laws 504 (to be codified as amended in scattered sections of WASH. REV. CODE ANN. (1987)).

RESEARCH PATHFINDER

AT&T DIVESTITURE & THE TELECOMMUNICATIONS MARKET

BY JOHN PINHEIRO †

INTRODUCTION

The United States Department of Justice filed an antitrust suit against the American Telephone and Telegraph Company (AT&T) on November 20, 1974. It charged that AT&T had used its dominant position in the telecommunications market to suppress competition and enhance its monopoly power. It sought the divestiture of AT&T from the Bell operating companies (BOCs: regionally dispersed companies offering local and regional services), and the divestiture and dissolution of Western Electric, AT&T's manufacturing subsidiary.

On January 7, 1982, the parties reached a settlement and AT&T agreed to divest the local exchange facilities held by the BOCs. The Justice Department agreed to release AT&T from a 1956 Consent Decree which prohibited AT&T from serving unregulated markets. Judge Harold Greene approved the settlement with some minor modifications on August 24, 1982, and the BOCs were completely divested on January 1, 1984. In his landmark decision, Judge Greene required the Justice Department to issue a triennial report examining competition in the telecommunications market.

In February 1987, the Justice Department produced its report and recommended that Judge Greene allow the regional companies to manufacture telephone equipment while offering both long-distance and electronic services—a combination of activities barred under the 1982 Consent Decree. The Justice Department argued that competition in the telecommunications industry had expanded so rapidly that the BOCs would not have an unfair advantage.

Judge Greene reached his decision in September 1987 and refused to lift the regulatory restrictions that prohibit the BOCs from providing long-distance service and making telephone equipment. Greene conflicted with the Justice Department report stating that the BOCs still have monopoly control over their local telephone networks. Although he upheld the restriction that bans BOCs from providing electronic information services, he allowed the BOCs to offer information services and enter into non-telephone businesses. In October 1987, the BOCs announced they would appeal this decision.

Revenues in the telecommunications industry are estimated to total \$186 billion in 1987, and are projected to grow by about 8% to \$201 billion in 1988. Telecommunications will certainly be one of the dominant global industries in the future and hence critical to United States international competitiveness.

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Recognizing the significance of this development, this pathfinder identifies the legal framework that controls the direction of this industry. It begins with a chronology detailing important events and a glossary of terms and abbreviations. Next, it examines the relevant case law. Along with the precedent-setting divestiture decisions, the Federal Communications Commission (F.C.C.) has rendered rulings referred to as Computer Inquiry I, II, and III. These authoritative rulings, along with Judge Greene's decisions, establish the parameters of regulation in the telecommunications industry. Additionally, this pathfinder includes annotations of significant books, articles, and other background information addressing business, economic, and public policy issues in telecommunications. Finally, the pathfinder concludes with a list of public and private organizations involved in the industry. (Note: the research in this pathfinder is current as of March, 1988.)

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I. CHRONOLOGY OF MAJOR EVENTS

The breakup of AT&T was the culmination of more than thirty years of legal wrangling between the federal government and the telephone company. The following is a brief chronology of key dates:

- 1949: Justice Department filed suit alleging that AT&T is violating the Sherman Antitrust Act and asks that Western Electric, the manufacturing arm of the Bell system, be spun off as a separate company.
- 1956: AT&T agreed to a consent decree that ends the lawsuit. The company agrees to confine its activities to common-carrier communication services and government projects. It promises to only manufacture products needed by the Bell system and agrees to make its existing patents available to anyone without charge.
- 1971: The Federal Communications Commission (F.C.C.) released its Final Decision and Order, commonly referred to as Computer Inquiry I. It regulated communications, deregulated data processing, and left "hybrid" services up to the Commission's discretion.
- 1974: Justice Department acted under the Sherman Antitrust Act and charged AT&T, Western Electric and Bell Laboratories with conspiracy to monopolize the telecommunications industry. All twenty-two of the BOCs were charged as co-conspirators.
- 1980: F.C.C. rendered its Final Decision, known as Computer Inquiry II. Although this decision was later modified and affirmed, it reclassified services as either "basic" which were regulated, or "enhanced" which were not regulated. It also imposed structural separation requirements for major carriers.
- 1982: Judge Greene finished the Modified Final Judgment (MFJ) consent decree which released AT&T from the 1956 decree's restrictions on entering new businesses. In return AT&T was required to divest itself of its twenty-two local BOCs.

- 1984: Divestiture is completed and the former telephone monopoly is broken into eight units. AT&T remains as a provider of long-distance service and the twenty-two BOCs are consolidated into seven regional holding companies (RHCs). Judge Greene requires the Department of Justice to issue a report three years later analyzing the present market and conditions.
- 1986: F.C.C. released Computer Inquiry III which revised the classification problems created by Computer Inquiry II. Accordingly, the F.C.C. required AT&T and the BOCs to develop Open Network Architecture (ONA) standards based on a set of stated principles and parameters.
- 1987: *January*
Department of Justice released its report, *The Geodesic Network: 1987 Report on Competition in the Telephone Industry*, as requested by Justice Greene in the MFJ. It recommended that the regional companies be allowed to offer both long-distance and electronic information services, and to manufacture telephone equipment.
- September*
Judge Greene rendered his decision based on the report by the Department of Justice. He eliminated some restrictions on the BOCs but refused to remove others because the BOCs still had monopoly control over local telephone networks. He allowed the regional holding companies to transmit electronic information services, while upholding the restriction that bans them from providing the content and the actual service.
- October*
Several BOCs announced that they would appeal Judge Greene's Decision.
- December*
Judge Greene ruled that the BOCs can neither design nor develop phones and other telecommunications products.
- 1988: *March*
Judge Greene ruled that the BOCs can offer information services such as electronic mail and voice messaging. He continued, however, the restriction against the seven regional companies prohibiting them from providing the content for the information services or offering electronic Yellow Pages.

II. TERMS AND ABBREVIATIONS

ADAPSO:	Association of Data Processing Service Organizations.
Asynchronous Protocols:	Generic means of encoding, packaging, and controlling digital signals widely used in data communications.
Basic Services:	Services limited to the common carrier offering of transmission capacity for the movement of information including data processing, computer memory or storage, and switching techniques; this category of services was regulated under Computer Inquiry II.
BOC:	Bell Operating Companies are the twenty-two companies that offer local and regional service and are dispersed throughout the United States. Sometimes this term is used interchangeably with RHC, which refers to the seven regional holding companies.
Bottleneck Access:	Refers to BOCs' monopoly control over the local exchange facilities, for which there is no equivalent alternative. The MFJ dealt with this bottleneck by separating the competitive long-distance and equipment markets.
Bypass:	The use of facilities other than the local telephone company's to interconnect customer locations to either local telephone users at large, other customer locations in the same city, or to a long-distance carrier. In the case of long-distance access, the substitution of lower priced leased lines for switched (feature group) access is also a form of bypass. Judicially, bypass exists "when a telephone customer is able to reach those with whom he wishes to communicate without the use of the facilities of a Regional [Bell Operating] Company or its equivalent in the territories serviced by independents." <i>United States v. Western Electric</i> , 673 F.Supp. 525, 537, n.45 (D.D.C. Sept. 10, 1987). The established carriers are concerned that consumers will replace public communications links with private systems, thereby decreasing demand for carrier services.
CCLC:	Common Carrier Line Charge (vs. SLC).
CD ROM:	Compact-disk read-only memory is a storage device utilizing technology similar to the recording industry's compact disks. It is expected to become an increasingly important

- storage medium and link in the future distribution of information.
- CEI: Comparably Efficient Interconnection, which is a standard advocated in Computer Inquiry III.
- CENTREX: Multipoint-to-multipoint system which handles voice switching for large users and provides customers ubiquitous access to all other network subscribers.
- COG: Centralized Operations Group is a group that processes, coordinates, and schedules orders for CPE interconnection.
- Common Carrier: "[A]ny person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio or in interstate or foreign radio transmission of energy. . ." 47 U.S.C. § 153(h). Common carriers offer a class of services, provided by a combination of land lines, satellite and broadcast transmissions, including telephone, telegraph, facsimile, telephoto, and broadcast program transmission. They must offer transmission services at fixed rates to any interested customer, and they are regulated much like electric utilities and gas companies.
- Computer Inquiries: F.C.C. decisions regulating participants in the telecommunications industry. See cases described in Section I(A).
- CPE: Customer Premises Equipment includes equipment employed on the premises of anyone other than a carrier that is utilized to originate, route, or terminate telecommunications. It does not include equipment used "to multiplex, maintain, or terminate access lines." *United States v. Western Electric*, 673 F. Supp. at 552, n.116 (D.D.C. Sept. 10, 1987).
- CPNI: Computer Proprietary Network Information.
- CPU: Central Processing Unit is the control function or processor of a computer system. It executes computer instructions and usually consists of a logic unit, internal memory, buffers, and registers.
- Cross-subsidization: Refers to the use of revenues from one source to subsidize another business in a monopolistic manner. In the telecommunications industry, cross-subsidization typically applies to the situation where carriers (a) improperly burden ratepayers with artificially high rates by shifting costs of unregulated activities to regulated activities, and (b) later

shift revenues earned from regulated activities to unregulated business activities to gain an anticompetitive advantage.

- DGT: Director Generale des Telecommunications, the French state-owned telephone company that also owns all videotex access points.
- DOJ: Department of Justice (see Appendix III).
- EAEA: Equal Access Exchange Areas.
- ECSA: Exchange Carrier Standards Association is a relatively new private group that develops and oversees standards.
- Enhanced Services: Services that go beyond the carrier offering of transmission capacity for the movement of information. These services were deregulated under Computer Inquiry II.
- Equal Access: The ability of long-distance carriers to connect their subscribers through BOC facilities on an equal basis.
- F.C.C.: Federal Communications Commission (see Appendix III).
- FN/SI: Feature Node/Service Interface, a standard developed by Ameritech in conjunction with Bell Communications Research.
- FTS 2000: Network which will provide voice, data, video, and dedicated transmission services to government offices throughout the United States. Currently several companies are bidding on this 10-year contract which could approach \$25 billion.
- Gateways: Facilities used to deliver videotex similar to France's Videotex access points that have the following functions: data transmission, address transmission, protocol conversion, billing management, and introductory information content.

- Geodesic Network: Doctor Huber, author of the recent Justice Department report, concludes that the exchange network is being transformed from a "pyramid" to a "geodesic" network. In a pyramid, very few switches are arranged in a vertical hierarchy, which has historically been caused by the expensive costs of switching relative to transmission. In a geodesic network the number of switches and connections between them are much greater. Consequentially, the processing and control functions are decentralized. Dr. Huber contends that a geodesic network will evolve due to the decreased costs of switching and processing brought about by technological innovation. Geodesic networks are preferred because they support many interconnected, vertically integrated providers, and hence, erode monopolistic bottleneck control. Many argue, however, that this model does not characterize the present domestic telecommunications industry, nor will it in the foreseeable future.
- GTE: General Telephone and Electronics Corporation.
- Information Services: "The offering of a capability of generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information which may be conveyed via telecommunications." *United States v. AT&T*, 552 F. Supp. 131, 229 (D.D.C. 1982), *aff'd sub nom., Maryland v. United States*, 460 U.S. 1001 (1983) (also referred to as the Consent Decree); *see* cases described in Section I(A). § 11(d)(1) of this decree prohibits the RHCs from providing information services.
- Interexchange Service: Telecommunication between a point in one LATA (or exchange area) and a point located in another exchange area. It can loosely be equated with long-distance service (although some long-distance services occur within a LATA). Interexchange service includes both facilities-based service and the resale of the service by others. It is not limited to transmission, but includes related activities such as interexchange traffic routing, the selection of interexchange carriers through least-cost routing or shared tenant service systems, and the marketing of the services of interexchange carriers.

- ISDN: Integrated Services Digital Network, a service being developed through which numerous data communications can be handled over one broad band.
- ITT: International Telephone and Telegraph.
- ITU: International Telecommunications Union is a specialized agency of the United Nations through which the nations regulate the use of the air for communications purposes.
- IXC: Interexchange Carrier.
- LAN: Local Area Network is a high speed data communications line (e.g., twisted-pair cable or fiber optic) that connects data terminals, Central Processing Units, and other peripheral equipment within a particular location.
- LATA: Local Access and Transport Area is a term describing the geographic areas created by AT&T's Plan of Reorganization in which BOCs provide services. Each LATA encompasses "one or more contiguous local exchange areas serving common social, economic, or other purposes." *United States v. AT&T*, 552 F. Supp at 229.
- LEX: Local Exchange Carrier, includes all the local facilities both of a RHC as well as independents.
- LMS: Local Measured Service.
- MCI: MCI Telecommunications Corporation.
- MFJ: Modified Final Judgment or Modification of Final Judgment, portion appended to the AT&T divestiture decision in *United States v. AT&T*, 522 F. Supp. 131 (D.D.C. 1982), *aff'd sub nom., Maryland v. United States*, 460 U.S. 1001 (1983). Also referred to as the Consent Decree. See cases described in Section I(A).
- Mobile Services: Includes transportable services such as cellular radio, paging, and other mobile interexchange services.
- MSA: Market Service Area.

NARUC:	National Association of Regulatory Utility Commissioners.
NCTE:	Network Channel Terminating Equipment.
NTIA:	National Telecommunications Information Administration, Executive branch agency under the Commerce Department principally responsible for the development and presentation of domestic and international telecommunications and information policy.
NTS:	Non-Traffic-Sensitive Costs (as opposed to TS which are traffic-sensitive costs).
NTT:	Nippon Telephone and Telegraph.
OAN:	Operator Assisted Network.
OCC:	Other Common Carriers.
ONA:	Open Network Architecture standards are promulgated by the F.C.C. in its Computer III decision as an alternative to requiring structural separation between a dominant telecommunication carrier's regulated and unregulated service activities. These standards will theoretically unbundle the components of exchange services and permit the purchase of each component or "basic service element" under a tariff on an "equal access" basis.
OTP:	Office of Telecommunications Policy.
PBX:	Private Branch Exchange performs switching and processing functions forming part of an expanded network.
POP:	Point-of-presence serves as an entry point to a long-distance carrier's network. Long-distance carriers have multiple POPs within each LATA.
PUC:	Public Utilities Commission.
PTC:	Primary Toll Carrier.
RBOC:	Regional Bell Operating Company (synonymous with RHC).

- RCED: Resources, Community, and Economic Development Division.
- RHC: Regional Holding Companies are the seven companies that now own the regulated telephone companies divested by AT&T. The seven companies are Pacific Telesis Group in California and Nevada; U.S. West Inc., in the Northwest, Mountain, and Northern Plains states; Southwestern Bell Corporation in southwestern states; American Information Technologies Corporation (Ameritech) in the midwestern states; Bell Atlantic Corporation in the Mid-Atlantic region; Bell South Corporation in southern states; and NYNEX Corporation in New York and New England. (Synonymous with RBOC.)
- SLC: Subscriber Line Charge (vs. CCLC).
- Structural Separation: Requirement imposed by Computer Inquiry II requiring major carriers to provide enhanced services and CPE only through corporate affiliates fully separated from their basic services operations.
- Switches or Switching: Electronic device that takes incoming calls and routes them to outgoing facilities via local telephone lines or long-distance transmission lines. It is used to describe both a PBX in a single location and switches used at local telephone company central offices.
- TBDF: Transborder Data Flow.
- USOA: Uniform System of Accounts, established in 1935 as a means for classifying, recording, interpreting, and reporting a telephone company's financial information. The revised USOA (F.C.C. Docket 78-196) will provide only a financial accounting system.
- VAN: Value Added Network.
- VMS: Voice Message Storage involves the storage of telephone messages in the network for subsequent sending or retrieval. Examples include "advance calling" and "call answering."

Videotex: A wide variety of easy-to-use interactive data services arranging information in a text or graphic format on a video display with user input. This two-way communication service allows users to call up information, such as airline schedules or databases, and also perform transactions such as teleshopping, order entry, electronic mail, or electronic banking from home. It usually operates over telephone lines, and users can obtain access to Videotex with a dedicated terminal or a personal computer.

WATS: Wide Area Toll Service

III. CASES

The three F.C.C. Computer Inquiries, the 1982 AT&T consent decree, and Judge Greene's 1987 decision in *United States v. Western Electric* form the basis of current telecommunications industry regulations. In this section, Part A provides a detailed description and chronological listing of the principal decisions leading up to Greene's September 1987 decision. Part B then provides a detailed summary of this decision. Substantial discussion is devoted to this case, given its importance and lengthy analysis. Since this decision exhaustively examines the current issues and includes a considerable amount of background information, it provides an excellent starting point for research in this area. Following this discussion is a summary of Judge Greene's follow-up decision in December 1987. Finally, Part C examines a series of other relevant decisions.

A. Principal Cases

The 1956 Decree:

This decision prohibited AT&T from serving unregulated markets and confined AT&T's activities to common-carrier communication services and government projects. AT&T also promised to manufacture only products needed by the Bell system and agreed to make its existing patents available to anyone without charge. These guidelines were effective until the AT&T divestiture in 1982 following Judge Greene's decision in *United States v. AT&T*. *United States v. Western Electric Co.*, 13 Rad. Reg. (P&F) 2143, 1956 Trade Cas. (CCH) 71,134 (D.N.J. 1956).

Computer Inquiry I:

In Computer Inquiry I, the F.C.C. attempted to establish a regulatory framework for the provision of communications and data processing services. It adopted a three-part classification of computer and telecommunications services based on technical and functional characteristics—data processing, communications, and hybrid services. The F.C.C. decided not to regulate "data processing" services because these services were already offered on a competitive basis. "Communications" were regulated as common carrier offerings under Title II of the Communications Act. "Hybrid" services, offerings that combine "[r]emote [a]ccess data processing

and message-switching to form a single integrated service," were treated either as data processing or communications services based on F.C.C. determinations as to which characteristics predominate. The F.C.C. permitted common carriers other than AT&T and the Bell System subsidiaries to provide data processing services subject to a structural separation requirement. This requirement was designed to prevent such carriers from engaging in anticompetitive behavior such as discrimination and cross-subsidization of unregulated operations by only allowing them to provide data processing through a separate regulated subsidiary. *Tentative Decision*, 28 F.C.C.2d 291 (1970); *Final Decision and Order*, 28 F.C.C.2d 267 (1971), *aff'd sub nom.*, *GTE Service Corp. v. F.C.C.*, 474 F.2d 724 (2d. Cir. 1973); *decision on remand*, 40 F.C.C.2d 293 (1973).

Computer Inquiry II:

Significant technological and competitive developments in the telecommunications and computer industries exposed shortcomings in the F.C.C.'s definitional structure imposed in Computer I, in particular the F.C.C.'s *ad hoc* approach to evaluating the "hybrid" category. In Computer II, the F.C.C. adopted a new regulatory definitional scheme with two service categories: *basic* and *enhanced*. Basic service is limited to "the common carrier offering of transmission capacity for the movement of information." Data processing, computer memory or storage, and switching techniques can be components of a basic service if they are used solely to facilitate the movement of information. Enhanced service includes "any offering over the telecommunications network which is more than a basic transmission service." In order to maximize benefits for consumers, the F.C.C. promoted competition in the provision of enhanced services and Customer Premises Equipment (CPE). Accordingly, the F.C.C. mandated structural separation, requiring the major carriers to provide enhanced services and CPE through corporate affiliates fully separated from their basic services operations. Under the structural separation rules, AT&T's separate subsidiary was prohibited from providing basic services or owning any network or local distribution transmission facilities, while AT&T's basic services affiliates were prohibited from offering enhanced services or CPE. The F.C.C. required the separate subsidiary to obtain all transmission facilities necessary for providing enhanced services under tariff; elect separate officers; maintain separate books of account; employ separate operating, installation, and maintenance personnel; and perform its own marketing and advertising. The F.C.C. further ordered separate subsidiaries to deal with any affiliated manufacturing entity only on an arms-length basis and to utilize separate computer facilities in providing enhanced services. Moreover, the separate subsidiary was required either to develop its own software or to contract with non-affiliates for such software, except that it was permitted to obtain generic software embedded within equipment that its affiliate sold off-the-shelf to any interested purchaser. AT&T subsequently established AT&T Information Systems, Inc. as its separate subsidiary for enhanced services and CPE. *Final*

Decision, 77 F.C.C.2d 384, *modified on reconsideration*, 84 F.C.C.2d 50 (1980), *further modified on reconsideration*, 88 F.C.C.2d 512 (1981), *aff'd sub nom.*, *Computer and Communications Indus. Ass'n v. F.C.C.*, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983), *aff'd on second further reconsideration*, F.C.C. 84-190 (released May 4, 1984).

Disclosure Order:

In 1983, the F.C.C. promulgated an order requiring all carriers to disclose information regarding any new service or change in the network at a time reasonably before the implementation of a new service or change (the All Carrier Rule). In addition, the F.C.C. ordered AT&T to disclose to the public any network information disclosed to its separate subsidiary, all technical information concerning network services or changes in existing network services, information relating to the geographic availability of new network services, and information involving joint research and development by AT&T and its separate subsidiary leading to the design or manufacture of telecommunications products. *Computer and Business Equipment Manufacturers Association, Report and Order*, 93 F.C.C.2d 1226 (1983).

Modified Final Judgment (MFJ):

(a.k.a. "Consent Decree" or "AT&T Divestiture")

In January 1982, AT&T and the Department of Justice agreed to settle the antitrust lawsuit brought by the Department of Justice in 1974. The agreement proposed to the Court split AT&T generally into two components: (1) competitive services (long-distance and telecommunications equipment) and (2) regulated monopoly services (local telephone service). Provisions of the agreement included the following:

AT&T would divest itself of its monopoly local operating companies and would no longer provide local telephone service.

The divested BOCs would provide local service and equal access areas to all long-distance carriers (AT&T, MCI, etc.).

AT&T would keep its competitive long-distance service, its manufacturing arm, Western Electric, and its research and development unit, Bell Laboratories.

The 1956 Consent Decree would be repealed, allowing AT&T to keep its patents and provide unregulated services and equipment.

The rationale behind the divestiture was that a company providing both regulated monopoly services and competitive services has the incentive either to limit access to its rivals or to discriminate against its rivals in the competitive markets for access to AT&T monopoly services. Also, profits from the monopoly services could be used to subsidize its competitive activities. Such cross-subsidization would be unfair to rivals in the competitive markets and local telephone subscribers, who would have to pay more than they should for service. *United States v. AT&T*, 522 F. Supp. at 131.

BOC Separation Order:

In this order the divestiture court concluded that the BOCs should be required to provide CPE, enhanced services, and cellular services subject to a form of structural separation. It concluded that structural separation provided protection against improper cost-shifting that accounting safeguards alone could not provide. In addition, the court found that structural separation would alleviate concerns about potential BOC anticompetitive practices in enhanced services markets by requiring the BOCs to enter such markets on identical terms and conditions as other suppliers. Policy and Rules Concerning the Furnishing of Customer Premises Equipment, Enhanced Services and Cellular Communications Equipment by the BOCs, CC Docket 83-115, *Report and Order*, 95 F.C.C.2d 1117 (1984), *aff'd sub nom.*, *Illinois Bell Telephone Co. v. F.C.C.*, 740 F.2d 465 (7th Cir. 1984), *aff'd on reconsideration*, F.C.C. 84-252, 49 Fed. Reg. 26056 (1984), *aff'd sub nom.*, *North American Telecommunications Association v. F.C.C.*, 772 F.2d 1282 (7th Cir. 1985).

Computer Inquiry III:

By 1985 it was clear that Computer II's definitional dichotomy—classifying services either as basic (regulated) or enhanced (deregulated)—was sadly deficient. In Computer III, the F.C.C. declared AT&T and the BOCs responsible for developing “specific network designs” to implement Comparably Efficient Interconnection (CEI) while incorporating principles including: transparency, choice, equivalence, cost/pricing, unbundling, information disclosure, ISDN, and new services. The F.C.C. established a February 1988 deadline for the creation of a comprehensive “open network architecture” (ONA) standard which would replace the separate subsidiary requirements of Computer Inquiry II. Each ONA plan is approved subject to a public review period and compliance with accounting and other safeguards. Until the ONA standard is in place, a carrier must file a CEI tariff for each enhanced service it wishes to introduce. The CEI plan must include descriptions of the basic service elements used to support the enhanced service as well as interconnection and transmission rates. The commission also established CEI parameters including interface functionality, unbundling of basic services, technical equivalence, availability, and transport costs. Amendment of Sections 64.702 of the Commission's Rules and Regulations, *Report and Order*, 2 F.C.C.2d 280 (1986).

Joint Cost Order:

Under this order, each Regional Holding Company (RHC) is required to adopt a cost manual in accordance with cost allocation standards. Its purpose is to ensure that carriers engaged in both regulated and unregulated activities will not improperly burden ratepayers or gain an anticompetitive advantage by assigning costs of unregulated activities to regulated activities. *Separation of Costs of Regulated Telephone Service from Nonregulated Activities*, 104 F.C.C.2d 59 (1986); *RBOC Petition for Reconsideration of the Order*, 62 Rad. Reg. (P&F) 163 (1987). See F.C.C. News Release, Report

No. DC-723, Mimeo No. 1246 (Dec. 23, 1986) (Notice of Proposed Rule Making).

B. The 1987 Greene Decision: *United States v. Western Electric*

The 1987 Greene decision is organized into ten sections: Background, Standard for Removal of Restrictions, Interexchange Services, Manufacturing, Information Services, Regulation, Current Anticompetitive Activities & Public Policy, Information Transmission, Non-Telecommunications Services, and Conclusion. *United States v. Western Electric*, 673 F.Supp. 525 (D.D.C. Sept. 10, 1987). Each of these sections in the opinion is summarized below. (Note: this opinion was written by United States District Court Judge Harold B. Greene, and is referred to in this pathfinder as the "1987 Greene decision.") Following these sections is a discussion of Judge Greene's December 1987 and March 1988 decisions regarding the meaning of the term "manufacture," issues relating to enforcement of the decree, and the provision of information services. *United States v. Western Electric*, 675 F. Supp. 655 (D.D.C. Dec. 3, 1987); *United States v. Western Electric*, No. CA 82-0192, slip op. (D.D.C. Mar. 7, 1988).

1. Background

In the introductory portion of the opinion, the court provided a fairly useful description of the events that led up to this decision. While the introduction is a helpful place to begin research in this area, it is not a comprehensive background source.

2. Standard for Removal of Restrictions

Under section VIII(C) of the MFJ (see discussion of the Modified Final Judgment in Part A), the restrictions imposed on the RHCs (Regional Holding Companies) shall be removed upon a showing that there is no substantial possibility that the company can use its monopoly power to impede competition in the market it seeks to enter. The burden of proof was placed upon those requesting a removal of the restriction and consisted of a two-part test: (1) whether RHCs have a monopoly of an essential facility, the local switches and circuits; and (2) whether there is a substantial possibility that these companies have the incentive and the ability to use this monopoly power to impose competition in the particular line of business they now seek to enter. The court concluded that because the RHCs have retained control of the local bottlenecks, they are typically the only service providers for parties seeking transmission through local regional markets. The court based its conclusion, in part, on the statistically low incidence of bypass. It reasoned that the exchange monopoly controlled by the RHCs continues because of the economic and technological infeasibility of alternative local distribution techniques. While it will be difficult to maintain a monopoly over local switching in the long term, the court did not remove this restriction based on the RHC's current control over local bottlenecks.

3. *Interexchange Services*

Under section II(D)(1) of the MFJ, RHCs are prohibited from providing "interexchange telecommunication services." The court refused to remove this restriction, stating that "[o]nly when a practical and economically-sound method is found for large-scale bypass or for connecting local customers by different methods—as microwaves and satellites were ultimately found to be feasible for handling long-distance traffic—can the Regional [Bell Holding] Companies' local monopoly be regarded as eroded."

4. *Manufacturing*

Section II(D)(2) of the MFJ, as amended by section VIII(A), prohibited the RHCs from manufacturing or providing telecommunication products or manufacturing Customer Premises Equipment (CPE). The court held that no changes have occurred within the last three years that warrant removal of this restriction. This conclusion was based on the following facts: (1) RHCs maintain an ironclad hold on the local exchanges; (2) they collectively account for purchases of 70% of the national output of telecommunications equipment; (3) if the restrictions are lifted, the RHCs may be expected to buy from their own manufacturing units; (4) no measures can counteract this situation; (5) removing this restriction would allow the manufacturing sector to become monopolistic. Therefore, the court surmised that lifting the restrictions would allow the RHCs to foreclose nearly 70% of the equipment market, which would be further aggravated if the RHCs acted in concert. Finally, the court felt a removal of the restriction would extinguish or substantially curtail the healthy competitive domestic market that has emerged within the last three years.

5. *Information Services*

Section II(D)(1) of the MFJ prohibited RHCs from providing "information services" and a related provision of section VIII(D) prohibited AT&T from providing electronic publishing services for seven years from the date of the original MFJ decree. The court reaffirmed that the removal of the information services restriction would have to await "significant technological or structural changes" that would substantially reduce the dependence of information service providers on the local exchange networks. It reasoned that competition would be foreclosed because of the economic infeasibility of alternative local distribution technologies on a substantial scale.

6. *Regulation*

In this section, the court addressed the argument that the F.C.C. regulations will adequately solve the antitrust problems presented. The court concluded that the need for court-imposed restrictions is even greater today because many of the current operations of the RHCs occur in unregulated markets. This conclusion was supported by six findings. First, the F.C.C. was historically unable to prevent or remedy major anticompetitive abuses by the Bell System achieved through activities of its local affiliates.

Second, regulatory measures could not "approach even remotely" the effectiveness of a decisive court decree. Third, the court could only rely on regulation following a showing of substantial improvement in the regulatory language and practice. Fourth, recent changes have weakened regulations governing telecommunication carriers. Fifth, the F.C.C. has adopted a deregulation mentality and "[a] regulated body that is committed in principle to as little regulation as possible can hardly be cited . . . in support of the proposition that it will probably regulate more vigorously and more effectively than its predecessors which wanted to engage in tight regulation and operated in a general government environment that regarded strict regulation as a positive goal." Finally, the court argued that the budget and manpower of the F.C.C. has decreased significantly. Hence it is even less capable of regulating the industry than before. The court then discussed three other related factors: cross-subsidization, interconnection, and network design information. It found that previous regulatory programs did not succeed in preventing cross-subsidization. Furthermore, the Joint Cost Order which was initiated to prevent cross-subsidization cannot be relied upon. Concerning interconnection, the court held that the ONA proposal adopted by Computer Inquiry III has not been defined fully nor adopted or tested in the real world. Hence, the court contended that it is impossible to evaluate its effectiveness in preventing discrimination in interconnection. Finally, with regard to network design information, the F.C.C. regulations currently require disclosure of information regarding introduction of new network services or charges in existing network services as well as marketing information. The court stated that this regulation has been significantly relaxed such that RHCs are now able to use network information to design new equipment or a CPE device as soon as the information is finalized by the network planners. Hence, significant potential for monopolistic behavior still exists.

7. Regional Company Activities & Public Policies

In this section, the court addressed the current anticompetitive activities by discussing individual companies and statistical analysis. The court was persuaded by the statistic that RHCs had a total income from telephone operations paid by ratepayers of almost \$13 billion while sustaining a loss from other activities amounting to \$1/2 billion during the period examined. The court stated that these figures suggest that a rise in local telephone rates during the past several years may be due to the cross-subsidization (or diversion) of ratepayers' money to finance losses from other subsidiaries. It then articulated other relevant public policies including ratepayer protection, the Congressional mandate of universal service, and First Amendment considerations.

8. Transmission of Information Services

The court denied requests for removing the restriction on RHCs from controlling the content of information services. After examining the wide

network of Videotex services available in France and other similar foreign services, it had no definitive answer whether the transmission of information services by RHCs would impede competition. Thus, it exempted RHCs from part of the information restrictions, permitting the RHCs to transmit information services without controlling the content.

9. *Non-Telecommunication Services*

Section II(D)(3) of the MFJ prohibited RHCs from providing any other product or service that is not a natural monopoly service actually regulated by tariff, except exchange telecommunication and exchange access service. In other words, it prohibited the BOCs from participating in "unrelated businesses" in which they might be able to obtain improper competitive advantages by leveraging their control over local monopolies. Previously, the RHCs were able to petition for removal and obtain a "waiver" if the unrelated business (1) is operated as a separate subsidiary, (2) obtains its own debt financing on its own credit, (3) limits total estimated net revenue to under 10% of the companies' total net revenue, and (4) applies the established monitoring and visitorial provisions. The court ruled that these restrictions may safely be removed pursuant to section VIII(C) of the MFJ. While the problem of cross-subsidization remains, on balance the court found that removal would promote competition.

10. *Conclusion*

The court in the 1987 Greene decision identified three goals underlying its analysis and conclusions: (1) establishing fair competition, (2) providing universal service and reasonable rates for those who cannot otherwise afford telephone service, and (3) encouraging innovation to the end that the full benefits of a sophisticated telecommunications industry are made available to all segments of the American public. It refused to remove most of the restrictions imposed by the Modified Final Judgment because of potential anticompetitive consequences. It did, however, repeal the "catchall" restriction that prohibited the entry of the RHCs into non-telecommunication markets. In addition, it lifted the restriction prohibiting RHCs from transmitting information services while leaving the restriction prohibiting RHCs from controlling the content of information services.

United States v. Western Electric, 675 F. Supp. at 655.

Judge Greene clarified the meaning of the term "manufacture" in section II(D)(2) of the decree. In April of 1985 AT&T filed with the Department of Justice requests for enforcement of the decree's prohibition on Regional Company manufacturing of telecommunications equipment and customer premises equipment. The DOJ refused to enforce this provision unless a Regional Company was actually fabricating equipment. Judge Greene attacked the DOJ's lack of enforcement efforts and declared that manufacturing includes both fabrication and product design and development. He indicated that the evidence underlying the decree strongly suggests that the Bell

System used its local monopoly position to disadvantage and drive out of business competing manufacturers of equipment primarily through discrimination and cross-subsidization at the design and development stages. Therefore, at this time the Regional Companies were prohibited from designing, developing, or fabricating telecommunications products and customer premises equipment.

United States v. Western Electric, No. CA 82-0192, slip op. (D.D.C. Mar. 7, 1988).

Judge Greene ruled that the BOCs can offer information services such as electronic mail and voice messaging that are provided by other vendors. These voice storage and retrieval services, for example, will enable the local phone system to act as an answering machine. Judge Greene continued, however, the restriction against the seven regional companies prohibiting them from providing the content for the information services or offering electronic Yellow Pages.

C. Other Cases

In this section, part 1 includes a summary of other cases. These cases were selected because they were decided within the past few years and are relevant to the issues decided in the 1987 Greene decision. Following these summaries, part 2 contains some research suggestions.

1. Summary of Recent Cases

United States v. Western Electric Co., 797 F.2d 1082 (D.C. Cir. 1986).

The District of Columbia Circuit Court of Appeals held that the restrictions of the consent decree (MFJ) did not violate the due process rights of the RHCs. In addition, the court held that the decree did not prohibit RHCs from providing exchange telecommunication services outside of their respective geographic regions.

Western Union Telegraph Co. v. F.C.C., 815 F.2d 1495 (D.C. Cir. 1987).

Under the *Sierra-Mobile* doctrine (Communications Act of 1934, 47 U.S.C. §§ 202, 205), the F.C.C. has power to prescribe changes in contract rates when it finds them to be unlawful, and to modify other provisions of private contracts when necessary to serve the public interest. In regard to this doctrine the circuit court held that the F.C.C. has the power to prescribe changes in contract rates when it finds them to be unlawful and to modify other provisions of private contracts when necessary to serve the public interest. The court also held that final revised rates for leasing special access facilities did not comply with the six-months-notice requirements.

Western Union Intern., Inc. v. F.C.C., 804 F.2d 1280 (D.C. Cir. 1986).

The court held that it is within the expertise of the F.C.C. to evaluate the cogency of technical economic data in determining the public interest. Thus, the F.C.C.'s judgment regarding the most effective

regulatory tools to apply in a particular situation is entitled to considerable judicial deference.

In re Long Distance Telecommunications Litigation, 647 F. Supp. 78 (E.D. Mich. 1986).

In this case the court ruled that the F.C.C. had primary jurisdiction over an action against two providers of nationwide long-distance telecommunications service, and the F.C.C. could determine whether charges and practices of providers were reasonable even though the complaint alleged a state law cause of action. 47 U.S.C. §§ 151-155, 201, 201(b) (1982).

Southern Bell Tel. & Tel. Co. v. F.C.C., 781 F.2d 209 (D.C. Cir. 1986).

The court upheld the F.C.C.'s use of remaining life depreciation rates which base depreciation on the actual remaining life of the asset. The court reasoned that accelerated methods of depreciation could potentially exacerbate the bypass problem in the short run by significantly increasing local carrier expenses, causing increased rates. It stated that the F.C.C.'s reliance on state commission assessments of local competitive conditions and the effect of higher rates in each state is reasonable and consistent with the Communications Act. 47 U.S.C. § 220(i). In addition, the F.C.C. generally has authority to set aside threshold requirements for telephone company applicants seeking waivers or variances from generally applicable rules. The F.C.C.'s only obligation when changing its policies as applied to telephone companies is to provide an explanation at the time of the change.

Bell Telephone Co. of Penn. v. F.C.C., 761 F.2d 789 (D.C. Cir. 1985).

The F.C.C.'s rejection of a retroactive increase in rates charged to other common carriers for exchange network facilities used in interstate access was arbitrary when the only basis for rejecting the tariff was the fact that it was retroactive. Since retroactive rate increases had been approved for the fourth year of the interim agreement, a conforming tariff could have been filed for the fifth year if the decision on fourth year rates had been timely issued. 47 U.S.C. § 203(c).

RCA Global Communications, Inc. v. F.C.C., 758 F.2d 722 (D.C. Cir. 1985).

Small carriers which are exempt under the Record Carrier Competition Act (47 U.S.C. § 609) can validly differentiate between rates charged to customers who used the carrier's network for both domestic and international components of an overseas transmission and the rate charged when another company provided service to or from the carrier's international switch. This holds notwithstanding a claim that the price differential violated a section of the Act which prohibits "unjust or unreasonable" price discrimination in the provision of "like communication service," because to hold otherwise would effectively nullify the small carrier exemption. 47 U.S.C. §§ 151-155, 202(a), 222(c)(1)(B).

North American Telecommunications Ass'n v. F.C.C., 772 F.2d 1282 (7th Cir. 1985).

A F.C.C. order which permitted RHCs and their equipment subsidiaries to submit joint bills to their customers for telephone service and equipment during the four-year period following divestiture was reasonable and within F.C.C. discretion. The F.C.C. order also permitted employees of RHCs who installed basic, single-line telephone service for home or businesses, to install and maintain single-line telephone equipment. Finally, the F.C.C. could require RHCs to submit plans of capitalization for F.C.C. approval, in order to make sure that equipment subsidiaries of companies were not undercapitalized and that companies were not subsidizing equipment subsidiaries in violation of a prior F.C.C. order.

Louisiana Public Service Com'n v. F.C.C., 106 S.Ct. 1890 (1986).

The United States Supreme Court held that the F.C.C.'s ability to pre-empt inconsistent state regulations, under the Communications Act of 1934 (47 U.S.C. § 151) and under the Supremacy Clause of the United States Constitution (Art. VI, cl. 2) is limited by 47 U.S.C. § 152(b). Therefore, the F.C.C. is forbidden to prescribe depreciation practices and charges in the context of ratemaking for intrastate service. Even though 47 U.S.C. § 220 deals expressly with the F.C.C.'s authority over depreciation, it does not automatically pre-empt state depreciation regulation for intrastate ratemaking, because the meaning of § 220 is not sufficiently straightforward as to override the command of § 152(b).

Eagle v. American Tel. and Tel. Co., 769 F.2d 541 (9th Cir.), cert. denied, 106 S.Ct. 1465 (1985).

A \$381 million refund the telephone company was required to pay the ratepayers due to rate overcharges did not injure minority shareholders by depreciating the value of their stocks. If the telephone company had avoided a refund by adopting an accelerated depreciation method of accounting for rate-making, the consequent tax benefit would have flowed through to ratepayers and the company would not have collected an offsetting amount in utility rates. Therefore, minority shareholders could not maintain an action under California law against majority shareholders for breach of fiduciary duty.

Yakima Valley Cablevision, Inc. v. F.C.C., 794 F.2d 737 (D.C. Cir. 1986).

Cable companies brought a petition for review of orders of the F.C.C. dismissing requests for declaratory rulings regarding the legality of certain state and local taxes imposed on earnings of cable companies. The court held that the F.C.C. may change enforcement policy retroactively, but such a decision must be justified and is subject to judicial review. 5 U.S.C. § 706(2)(A) (1982). The court concluded that the F.C.C.'s unreasonable failure to explain its decision not to address disputes over franchise fees was arbitrary and capricious.

GTE Service Corp. v. F.C.C., 782 F.2d 263 (D.C. Cir. 1986).

The Court of Appeals is required to give substantial deference to decisions of the F.C.C., particularly where the F.C.C. has determined that a particular course of conduct is or is not in the public interest.

Cellular Mobile Systems of Pennsylvania, Inc. v. F.C.C., 782 F.2d 182 (D.C. Cir. 1985).

Applicants for nonwire line cellular telephone licenses sought review of a F.C.C. decision granting a license to one applicant. The court upheld the F.C.C.'s conduct. In reviewing a decision of the F.C.C. based on insufficient detail in competing proposals, the Court of Appeals cannot invalidate a determination as arbitrary, capricious, or unsupported if the decision embodied a considered and sufficiently articulated judgment and was founded upon substantial evidence in the record.

Steele v. F.C.C., 770 F.2d 1192 (D.C. Cir. 1985).

While the F.C.C. is entitled to deference in deciding how the public interest will best be served, the reviewing court must ensure that the F.C.C.'s action is based on consideration of permissible factors and is otherwise reasonable.

2. Case Research Suggestions

In general, it was difficult to search broadly on Lexis and Westlaw for relevant cases because too many cases were retrieved (using "telecommunications" combined with various other search terms). The following search terms are probably helpful in conjunction with terms that relate to the specific issue to be researched: F.C.C., BOC, Divestiture, Telephone, Telecommunication, Competition, Monopoly.

A more specific research focus, however, will probably mitigate this problem. Overall, the annotated federal codes are a useful research tool (see Part II(A) for relevant code sections). In addition, the federal digest also provides an effective case retrieval tool. Under the topic "Telecommunications," the following key numbers were most useful:

In General

- 31: Nature, status and regulation in general
- 32: Companies and persons subject
- 45: Affiliation, consolidation and merger
- 46: Interconnection and mutual service; operating agreements
- 47: Legality and approval of agreements
- 48: Duty to connect with other lines or furnish service thereto

Telephone Service

- 261: In general
- 267: Competition, agreements and connections between companies

Charges and Rates

- 305: International and cable messages
- 306: Telephone charges and rates in general
- 307: Regulation in general
- 309: Contracts and franchises
- 316: Rate of return
- 323: Toll or meter charges; long-distance or interexchange, and pay phones;
- 334: Powers of administrative officers and scope of inquiry;
- 335: Notice of hearing; rehearing;
- 341: Scope of inquiry and powers of court;
- 349: Remedies; injunction and recovery of overcharge;

IV. LEGISLATIVE AND ADMINISTRATIVE LAW**A. Statutes**

Communications Act of 1934, 47 U.S.C. § 151 *et seq.*

§§ 151-155 contain the general provisions including the provisions creating the F.C.C.

§§ 201-224 contain the provisions regulating common carriers such as schedule of charges, valuation of property, and extension of lines.

Communication Satellite Systems, 47 U.S.C. § 701 *et seq.*

This Act contains provisions regarding congressional policy and purpose; federal coordination, planning, and regulation; and Communications Satellite Corporation.

Rural Electrification & Telephone Service, 7 U.S.C. § 901 *et seq.*

This Act provides and ensures adequate telephone service in rural areas. §§ 921-924 (Rural Telephone Service); §§ 930-940 (Direct Loan Program); §§ 941-950b (Telephone Bank).

Judicial Review of Agencies and Administrative Procedures 5 U.S.C. §§ 701 *et seq.*

Antitrust Procedures & Penalties Act, 15 U.S.C. § 16(b)-(h) (Tunney Act).

This Act requires public hearings to be held on antitrust settlements in order to assure the presiding Court that the settlement is in the public interest.

B. Regulations

Communications Act of 1934

47 C.F.R.

- § 31 (Uniform System of Accounts for Class A & B Companies, specifies mandatory accounts to be used by telephone companies with operating revenues above \$100,000).
- § 32 (Uniform System of Accounts for Class C Companies, specifies mandatory accounts to be used by telephone companies with operating revenues between \$50,000 and \$100,000).
- § 64.702 (Furnishing of enhanced services and CPE).
- § 64.702(d)(3) (F.C.C. regulation preventing RHCs from obtaining an unfair head start over CPE rivals).
- § 65 (Interstate Rate of Return Prescription Procedures & Methodologies; includes regulations regarding procedures, exchange carriers, interexchange carriers, and maximum rate of return).
- § 66 (Applications Relating to Consolidation, Acquisition, or Control of Telephone Companies; specifies contents of application, support required, and notice).
- § 67 (Jurisdiction Separation Procedures; regulates telephone property; operational revenues, certain income, and retained earnings; operating expenses and taxes; reserves; and universal service factor).
- § 68 (Connection of Terminal Equipment to the Telephone Network; specifies conditions on use of terminal equipment, registration, and complaint procedures).
- § 69 (Access Charges, details the computation and apportionment of access charges).

Rural Electrification & Telephone Service

7 C.F.R.

- § 1702 (Organizations & Functions).
- § 1789 (Audits of Electric and Telephone Borrowers).

C. Recent Bills

Telecommunications Equipment and Information Services Act of 1987

Congress enacted this bill to permit the BOCs to provide information services and to manufacture telecommunications equipment subject to F.C.C. regulation. Specifically, the BOCs can provide information services if no substantial possibility exists that offering such services could harm competition in the industry or customers. The BOCs may also compete as manufacturers subject to the same condition. The bill, however, does not

extend to electronic publishing because of the potential for BOC monopolies. It also specifies safeguards against cross-subsidization and the convening of a joint federal-state board to establish and implement the principles of cost assignment and allocation. H.R. 2030, 100th Cong., 1st Sess. (Apr. 9, 1987).

Telecommunications Equity Act of 1986

The Telecommunications Equity Act of 1986 enables BOCs to provide information services and to manufacture telecommunications equipment, subject to regulation by the F.C.C. S. 209, 100th Cong., 1st Sess. (Jan. 6, 1987).

Telecommunications Policy Coordination Act of 1987

This bill aims to improve coordination in formulating telecommunications policy within the executive branch. It establishes an Office of Telecommunications Policy and specifies its functions. H.R. 323, 100th Cong., 1st Sess. (Jan. 6, 1987).

Telecommunications Employees' Protection Act of 1987

Congress proposed this legislation to establish re-employment rights for employees who have lost employment as a consequence of the divestiture of the Bell system. H.R. 2828, 100th Cong., 1st Sess. (June 29, 1987).

Telecommunications Trade Act of 1987

This bill promotes expansion of international trade in telecommunications equipment and services. Its purpose is to foster economic and technical growth while ensuring that trading nations have open markets. The bill requires investigation of foreign trade barriers and stipulates responsive actions. Additionally, it provides authority for entering trade agreements and other miscellaneous provisions. S. 596, 100th Cong., 1st Sess. (Feb. 26, 1987).

D. Recent Hearings

Modified Final Judgment

Hearings Before the Senate Subcommittee on Communications on the September 1987 decision of Judge Harold Greene that addressed the continued need for the three "core" restrictions imposed by the MFJ on the Bell Operating Companies. The Subcommittee also examined comments on possible future information services. *Proposed Modifications to the AT&T Decree: Hearing Before the Senate Judiciary Comm., Subcomm. on Antitrust, Monopolies, and Business Rights*, 100th Cong., 1st Sess. (Comm. Ser. No. J-100-19) (C.I.S. Abstract v.18:11 S521-52).

Telecommunications Trade

Hearing before the House Subcommittee on Telecommunications and Finance to consider the Trade and International Economic Policy Reform Act

of 1987. Subcommittee consideration was limited to Title II of the Telecommunications Trade Act of 1986, which amends the Communications Act of 1934 to (a) require the U.S. Trade Representative to investigate and report to Congress on foreign barriers to competitive opportunities for U.S. firms in telecommunications markets, and (b) require the President to negotiate trade agreements meeting U.S. Trade Representative recommendations for fair markets for telecommunications products and services, or to implement retaliatory trade actions. *Telecommunications Trade: Hearings Before the House Comm. on Energy and Commerce, Subcomm. on Telecommunications and Finance, 100th Cong., 1st Sess. (Comm. Ser. No. 100-5 1987) (C.I.S. Abstract v.18:8 H361-82).*

Federal Telecommunications Policy Act of 1986

This hearing concerned Senate Bill 2565 (99th Cong., 2nd Sess. (June 18, 1986)) introduced by Senator Robert Dole, which may be reintroduced in the current congress in a modified form. The hearings before the Senate Committee on Commerce, Science, and Transportation considered whether to transfer jurisdiction over implementation of the MFJ from Federal District Court, the Justice Department, and the F.C.C., to the F.C.C. alone. The hearings also examined proposals to relax MFJ restrictions prohibiting BOCs from providing information services, manufacturing telecommunications equipment, or offering long-distance service. *Federal Telecommunications Policy Act of 1986, Hearings to Consider S. 2565, the Federal Telecommunications Policy Act of 1986, Before the Senate Comm. on Commerce, Science, and Transportation, 99th Cong., 1st Sess. (1986) (C.I.S. Abstract v.18:8 S261-26).*

Competitive Status of the Bell Operating Companies

Hearings before the House Subcommittee on Telecommunications, Consumer Protection, and Finance to examine the competitive status of the BOCs. The Subcommittee assessed the anticipated consumer effects of potential relaxation of restrictions prohibiting local telephone companies from providing information services, manufacturing equipment, or offering long-distance services. It included a discussion of H.R. 3687 (Telephone Ratepayer Protection and Technology Promotion Act of 1985) which sought to permit BOCs to provide information services and to manufacture telecommunications equipment as long as these activities are not subsidized with local telephone service revenues; and H.R. 3800 (Telecommunications Equipment and Information Services Act of 1985) which sought to allow BOCs to provide information services and to manufacture telecommunications equipment subject to F.C.C. regulation. *Statements and Discussions Before the House Comm. on Energy and Commerce, 99th Cong., 2d Sess. 174-350, 369-408 (1986) (statements of Laurence DeMuth, Exec. Vice Pres. and Gen. Counsel, U.S. West, Inc., Gary McBee, Vice Pres., Pacific Telesis Group, Paul Levy, Chair, Mass. Dept. of Pub. Util., Phillip Onstad, Chair, Int'l Communications Comm., A. of Data Processing Ser. Org., Uzal Martz, Chair, Telecom Comm., Am. Newspaper Pub. A., Henry Geller,*

Wash. Cen. for Pub. Pol'y Res., Gene Kimmelman, Legis. Dir., Consumer Fed'n of Am., Robert Coakley, Dep't Mgr., Hewlett-Packard Co.) (C.I.S. Abstract v.18:3 H361-21.2).

Transition in the Long-Distance Telephone Industry

Hearings before the House Subcommittee on Telecommunications, Consumer Protection, and Finance to review the status and consumer effects of the transition to competition in the long-distance telephone service industry following the AT&T divestiture of local operating companies, and to assess F.C.C. policies implementing telephone industry transition. *Transition in the Long-Distance Telephone Industry: Hearings Before the House Comm. on Energy and Commerce, Subcomm. on Telecommunications, Consumer Protection, and Finance, 99th Cong., 2d Sess.* (Comm. Ser. No. 99-145 1986) (C.I.S. Abstract v.18:6 H361-48).

V. BOOKS AND REPORTS

Books provide a diverse and in-depth examination of telecommunication issues. Given the pace of technological and regulatory change, they provide useful background information, but often fail to account for cutting-edge technical innovations or recent regulations. (When books could be classified under more than one topic, they were placed under the category that was most appropriate.) Reports, in contrast, often examine a specific topic and contain timely statistical and background information. The following list is an extensive collection of the most useful and relevant books and reports addressing this topic.

A. AT&T Divestiture

1. *The Huber Report*

THE GEODESIC NETWORK: 1987 REPORT ON COMPETITION IN THE TELEPHONE INDUSTRY, Antitrust Division, United States Department of Justice, Jan. 1987.

Peter W. Huber prepared this report as a consultant to the Department of Justice in accordance with the court's decision in *United States v. Western Electric Company*, 552 F. Supp. at 194-95. The purpose of the report is to examine how changing technical, competitive, and regulatory conditions affect the economic and antitrust rationales underlying the restrictions imposed by the MFJ. It contains a comprehensive and detailed compilation of data, and analysis relating to competition in the telephone markets. The report is comprised of seventeen chapters: The Geodesic Network, The Local Exchange, Interexchange Communications, Mobile Radio Services, Data Transmission and Packet Switching, Information Services, Computerized Databases and Electronic Publishing, Public Announcement Services, Electronic Yellow Pages, Voice Storage and Retrieval, Electronic Mail, Transactional Services, Alarm Monitoring, Central-Office Switches, Transmission Equipment, Private Branch Exchanges, and Terminal Equipment. While very technical, this report

is one of the most important secondary sources for research in this area.

2. *Background and Historical Information*

THE BREAKUP OF AT&T: OPPORTUNITIES, PROSPECTS, CHALLENGES, Reuben B. Robertson & Richard E. Wiley as Chairpersons, Law & Business, Inc. (1982).

This source begins with a collection of the rulings, memoranda, and stipulations regarding the AT&T divestiture between August 11, 1982 and October 14, 1982. The last 150 pages include speeches and background material discussing these legal documents and the market impact of the AT&T divestiture.

THE DEAL OF THE CENTURY: THE BREAKUP OF AT&T, STEVE COLL (1986).

In this book, the author provides an intensely detailed description of the events and people that contributed to the AT&T divestiture. The information was collected through numerous interviews and reviews of trial transcripts, settlement conference transcripts, court pleadings, depositions, exhibits, and various other notes and documents. While this book does not provide any current information, it provides a comprehensive background of the key individuals, the setting, and the conditions leading to, and culminating in, the divestiture of AT&T.

DISCONNECTING PARTIES, MANAGING THE BELL SYSTEM BREAKUP: AN INSIDE VIEW, W. BROOKE TUNSTALL (1985).

Written by the former Vice President of Organization and Management Systems at AT&T, this book provides an inside perspective on the planning and execution of the break-up, and the vast corporate restructuring. This book is primarily useful for managers since it describes a historical narrative of the events from a managerial perspective, but it is not a helpful tool for understanding the current status and objectives of AT&T.

ON THE LINE: THE MEN OF MCI—WHO TOOK ON AT&T, RISKED EVERYTHING, AND WON!, LARRY KAHANER (1986).

The history of MCI's assault on AT&T is traced in this book. The account begins in 1960 and chronologically examines several stages of development, concluding with the chapter entitled "Equal Access, 1983 to Present." The book is derived primarily from the author's observations, interviews, and official documents. It provides a useful historical account focusing on MCI rather than AT&T.

3. *Analysis of Divestiture and Implications*

THE AT&T SETTLEMENT: TERMS, EFFECTS, PROSPECTS, Law & Business, Inc. (1982).

The National Association of Attorneys General and Legal Times prepared this handbook for a briefing. While it was compiled

primarily as source material for briefing attendees of the conference, it also serves as a comprehensive reference manual and includes a list of speaker biographies. Although the seminar occurred on March 25, 1982, it provides useful analytical and background information that aids in understanding the divestiture decree.

DISCONNECTING BELL: THE IMPACT OF THE AT&T DIVESTITURE (Harry M. Shooshan III ed. 1984).

This book contains nine essays written by telecommunication experts who have been active participants in the events leading up to the AT&T breakup. These essays include discussions of economic theory, problems presented for regulators on the federal and state level, and the social impact of divestiture.

IMPLEMENTING THE AT&T SETTLEMENT: THE NEW TELECOMMUNICATIONS ERA, Practising Law Institute, G4-3738 (1983).

A 1983 P.L.I. Conference was the basis for this handbook which contains essays concerning regulated interexchange services, equal access, enhanced services, state and local regulation, and BOC post-divestiture opportunities. In addition, this volume includes a useful collection of case and legislative materials.

THE NEW TELECOMMUNICATIONS ERA AFTER THE AT&T DIVESTITURE: THE TRANSITION TO FULL COMPETITION, Practising Law Institute, G4-3780 (1985).

This is a useful handbook containing articles discussing equal access, access charges, enhanced services, market competition, and the restrictions and opportunities for BOCs. It also has a valuable collection of cases decided during 1985.

TELECOMMUNICATIONS AMERICA: MARKETS WITHOUT BOUNDARIES, MANLEY RUTHERFORD IRWIN (1984).

The authors of this book explore the implications of the AT&T-Department of Justice Consent Decree of 1982. Along with background information, they speculate as to the future direction of information products and services in the United States, examine the role of federal and state regulation, and juxtapose regulation and future economic trends. The book also contains several useful tables and figures regarding market and product information.

TELECOMMUNICATIONS: BELL OPERATING COMPANY ENTRY INTO LINES OF BUSINESS, U.S. Government Accounting Office (April 1986).

In this report, the Government Accounting Office examines the rationale advanced for allowing the regulated BOCs to enter various lines of business restricted by the MFJ. The report provides information on the MFJ, current procedures and results of the restriction waiver process, the basic issues and arguments for and against BOC expansion, federal agency views on the restrictions, and related F.C.C. regulation of BOC business.

B. Computer Inquiries

COMPUTER III: A NEW ERA, A GUIDE TO THE F.C.C.'S LANDMARK DEREGULATORY RULING (Dick Stirba ed. 1986).

This special report recalls the evolution of the F.C.C.'s Computer III ruling which allowed AT&T and the BOCs to offer enhanced services without the previously imposed structural separation requirements. The guide is based on reports published in F.C.C. Week over a twelve month period ending in June 1986, when the Commission's final ruling was issued. Overall, this is a very helpful source and contains valuable appendices providing the text of the original Computer III Notice of Proposed Rulemaking, Computer III Order, and Computer III Notice of Supplemental Rulemaking.

C. State and Local Markets

COMPETITION IN THE LOCAL EXCHANGE TELEPHONE SERVICE MARKET, ALFRED LEE & TIMOTHY SLOAN, U.S. Department of Commerce, NTIA Report 87-210 (Feb. 1987).

The National Telecommunications Information Association prepared this very informative report. It contains data gathered from the BOCs, their competitors, long-distance telephone carriers, and large communications user groups. From this database, the report draws conclusions about the characteristics and competitiveness of certain local exchange telephone markets. It concludes that the BOCs do not yet face a high degree of competition for many of their services and customers. Some market demands for alternative services are being met by new entrants, but so far competitors have not fully exploited the BOCs vulnerability to competitive entry.

NEW STATE TELECOM LAWS, Telecom Publishing Group (1986).

This report updates all major state regulatory activity in telecommunications, including copies of laws, with summaries and explanations. In addition it covers deregulation, utility commission authority, life-line plans, long-distance pricing, and intra-LATA competition.

TELEPHONE COMPETITION AND DEREGULATION: A SURVEY OF THE STATES, National Telecommunications and Information Administration, U.S. Department of Commerce (1986).

The National Telecommunications Information Administration conducted surveys concerning the regulatory activities in the fifty states and the District of Columbia. Recent regulatory and legislative actions promoting competition in the intrastate markets—intraLATA and interLATA toll, and local exchange—were studied.

D. Economics

BREAKING UP BELL: ESSAYS ON INDUSTRIAL ORGANIZATION & REGULATION (David S. Evans ed. 1983).

The economic issues involved in the AT&T breakup is the focus of this collection of essays. Written by consultants to the Justice Department between June 1980 and January 1982, the essays provide intricate economic analyses of antitrust and market conditions.

ECONOMIC ANALYSIS OF TELECOMMUNICATIONS: THEORY AND APPLICATIONS (L. Courville, A. de Fontenay, R. Dobell eds. 1983).

This book is a compilation of papers presented at the Conference on Economic Analysis of the Telecommunications Industry in Canada in 1981. The purpose of the conference was to apply past economic research to the unique characteristics of the telecommunications sector in Canada in light of public policy concerns. The book consists of chapters on production analysis, demand analysis, welfare considerations, and regulation.

THE ECONOMICS OF COMPETITION IN THE TELECOMMUNICATIONS INDUSTRY, JOHN R. MEYER, ROBERT W. WILSON, M. ALAN BAUGHUM, ELLEN BURTON, & LOUIS CAQUETTE (1980).

Although this book predates the divestiture of AT&T, it contains a valuable study that (1) analyzes the economic forces (competitive, regulatory, technological, etc.) at work in the telephone industry; (2) analyzes the impact of increased competition of the telephone industry and customers; and (3) identifies appropriate public policies for the industry. The authors overall conclusion is that the free market should decide the size, nature, and direction of the telecommunications industry.

TELECOMMUNICATIONS AND ECONOMIC DEVELOPMENT, ROBERT J. SAUNDERS, JEREMY J. WARFORD, BJORN WELLENIUS (1983).

Members of the United Nations World Bank wrote this book. It contains detailed macroeconomic and microeconomic analysis of benefits, telephone access and use, telecommunications tariff policy, and the mobilization of resources. In addition, the appendices focus on use of telecommunications in health care, postal services and telecommunications, and a survey of rural public call offices in Costa Rica.

E. Public Policy

COMMUNICATIONS DEREGULATION: THE UNLEASHING OF AMERICA'S COMMUNICATIONS INDUSTRY, JEREMY TUNSTALL (1986).

This book provides a broad perspective in its discussion of deregulation in the communications industry. It identifies a series of events that promote the policy of placing new technologies in private hands.

HERITAGE & DESTINY: REFLECTIONS ON THE BELL SYSTEM IN TRANSITION, ALVIN VON AUW (1983).

This personal account of national telecommunications policy and the character of AT&T is written by a former vice president and assistant to the chairman of the board of AT&T. The book covers topics including regulation/deregulation and public policy, Bell system's technology and the stress of policy change, accountability of AT&T to its shareholders and the public, and policy-making and the character of the business.

TELECOMMUNICATIONS AND PRODUCTIVITY (Mitchell L. Moss ed. 1980).

An international conference focusing on the effects of telecommunications systems on individuals and organizations, rather than the specific technologies, provided the material for this book. It is organized into sections examining the potential of telecommunications systems, public and private roles of telecommunications policy making, the work environment, services to the home, public uses of telecommunications systems, and emerging policy directions.

TELECOMMUNICATIONS POLICY HANDBOOK (Jorge Reina Schement, Felix Gutierrez, Marvin A. Sirbu, Jr. eds. 1982).

A collection of articles discussing telecommunications policy research written by government officials and the research community is contained in this book. The essays focus on policy-oriented themes such as converging technologies, reforming public broadcasting, pricing communication services, understanding change, and influencing policy. Some of the selections are very specific, while others are abstract.

TELECOMMUNICATIONS REGULATION TODAY AND TOMORROW (Eli M. Noam ed. 1983).

This book is a compilation of articles from a conference at the Columbia University Graduate School of Business. The articles are divided into four chapters by topic: the passing of the public utility concept; new industry and new regulation; legislation; and access, pricing, and local competition. The book is outdated in terms of recent industry developments, but contains a variety of interesting and pertinent policy discussions.

F. International

THE CALCULUS OF INTERNATIONAL COMMUNICATIONS, MEHEROO JUSSAWALLA & CHEE-WAH CHEAH (1987).

The political economy of Transborder Data Flows (TBDF) is studied in this book. Beginning with background information and the historical and institutional setting of TBDF, the authors proceed to examine its growth and provide an economic analysis of information privacy, regulation, and TBDF policy coordination.

COMMUNICATION REGULATION AND INTERNATIONAL BUSINESS (J.F. Rada & G.R. Pipe eds. 1984).

A collection of essays presented at the International Management Institute workshop in April 1983 are contained in this book. The conference involved a discussion of trends in the telecommunications industry by government officials, international institutions, and academics. The topics covered include transborder data flow, protection of privacy, as well as perspectives on telecommunications issues from Canada, Brazil, Japan, and industry.

THE COMPETITION FOR MARKETS IN INTERNATIONAL TELECOMMUNICATIONS, RONALD S. EDWARD (1984).

Developments in telecommunications policy in seventeen selected countries are explored in this book. It profiles the telecommunications industry in each country and focuses on the structure and policies that govern the degree of access by U.S. companies. For each nation, the authors identify the present organizational structure of the industry, governmental policies concerning the provision of domestic and international telecommunications service, approval processes controlling foreign-produced telecommunications equipment, governmental policy regarding information processing such as valuation and taxation, differences in policies applied to U.S. services versus other countries, future plans to expand competitive access, and views of overseas consumer groups and professional organizations concerning competition. The countries included in the study are Australia, Austria, Belgium, Brazil, Canada, Federal Republic of Germany, France, Hong Kong, Italy, Japan, Mexico, Philippines, Singapore, Sweden, Switzerland, United Kingdom, and Venezuela.

THE DEREGULATION OF INTERNATIONAL TELECOMMUNICATIONS, RONALD EDWARD (1985).

The F.C.C. has restructured the international telecommunications marketplace with the intention of (1) providing for increased market and technological competition, and (2) relying on this enhanced market competition instead of traditional regulation. As a result of several actions, the National Telecommunications and Information Administration has been commissioned to evaluate these actions, summarize the overall effect of the actions, estimate their impact on the consumer, and identify additional steps which are needed to promote fair competition. Their findings and analyses are contained in this book. It concentrates on international telecommunication topics including a description and summary of the F.C.C. actions and their impact, evolving technologies and services, ISDN and global network services and regulations, response of foreign administrations' correspondents, international facility planning and use, long-term market position of international service carriers, and the issues and implications concerning international telecommunications deregulation.

INTERNATIONAL TELECOMMUNICATIONS & INFORMATION POLICY (Christopher H. Sterling ed. 1984).

Presented in this report is a symposium of issues in international telecommunications and information policy. The symposium responded to the government report issued in the beginning of 1983 which outlined the United States' policy options. Also included is the National Telecommunications & Information Administration (NTIA) report entitled "Long-Range Goals in International Telecommunications and Information: An Outline for United States Policy."

THE JAPANESE COMPUTER AND TELECOMMUNICATIONS INDUSTRY 1986: PROFILE & ANALYSIS, Telecom Publishing Group.

In this two-volume set, the Telecom Publishing Group analyzes major sectors of the Japanese computer and telecommunications industry and profiles many companies involved in the industry. Volume I investigates major market sectors including artificial intelligence, cellular radio, computers, semiconductors, telecommunications carriers, telecommunications equipment, and videotex. The report examines each market sector, analyzes its growth potential and regulatory trends, and assesses its openness to sales by U.S. and foreign equipment and service providers. Volume II describes 200 Japanese computer and telecommunications firms, including operating statistics and details regarding their R&D efforts. The profiles vary in length, but cover all of the industry sectors analyzed in Volume I. Volume II is a comprehensive reference tool that provides facts about all of the major and minor participants in the market.

LONG RANGE GOALS IN INTERNATIONAL TELECOMMUNICATIONS AND INFORMATION: AN OUTLINE FOR UNITED STATES POLICY, NATIONAL TELECOMMUNICATIONS INFORMATION ADMINISTRATION, United States Department of Commerce, National Technical Information Service, PB83-175893 (Feb. 1983).

International trends and long-range goals are explored in Part I of this government report. Part II describes the international processes (collaboration and compromise with other countries) through which the United States seeks to advance its interests. This section discusses the International Telecommunications Union and its upcoming challenges. Part II also explains the problems of government structure and organization that should be promptly and soundly resolved to ensure comprehensive, consistent, and effectively executed policy. Finally, Part III delineates important issues on which specific policies and strategies must be developed.

TELECOMMUNICATIONS DEVELOPMENT IN COMPARATIVE PERSPECTIVE: THE NEW TELECOMMUNICATIONS IN EUROPE, JAPAN AND THE U.S., Michael Borrus, Francois Bar, Patrick Coge, Anne Brit Thoresen, Ibrahim Warde, and Aki Yoshikawa (May 1985), Berkeley Roundtable on the International Economy (BRIE) Working Paper.

The Berkeley Roundtable on the International Economy focuses on advances in digital telecommunications networks and their impact in

industrialized countries in this report. It summarizes the different approaches taken in the United States, Japan, and Europe, and how these strategies competitively position each country to take advantage of the emerging use of broad-band technology.

THE UNITED STATES IN THE INTERNATIONAL TELECOMMUNICATIONS UNION AND IN PRE-ITU CONFERENCES, MILDRED L.B. FELDMAN (1976).

Nations regulate the use of the air for communications purposes through the ITU. This book explains the United States' role in the international telecommunication conferences held since the late 1800s. Although the discussions focus on radio and telegraph technologies, the book presents a useful historical view of United States' participation in ITU Conferences.

G. Miscellaneous

THE CHANGING TELEPHONE INDUSTRY: ACCESS CHARGES, UNIVERSAL SERVICE, AND LOCAL RATES, Congressional Budget Office (June 1984).

In this report, the Congressional Budget Office analyzes the impact of the F.C.C. decisions concerning the recovery of fixed costs and cost recovery methods used by local telephone companies. It also contains useful, but slightly out-of-date tables and appendices.

1986: THE YEAR IN REVIEW, Telecommunications Reports, Inc.

Activities in the telecommunications industry during 1986 are summarized in this report. While the issue is dated, it contains a useful exposition of trends and events of the past which set the stage for future developments. This report is divided into twenty short chapters narrating events such as access charge areas, federal preemption, local rate hikes, etc.

VI. ARTICLES

Articles are important resource tools because they provide more recent information than books. The law review articles generally provide thorough analyses and extensive footnotes, while articles from specialized magazines (such as PUBLIC UTILITIES FORTNIGHTLY and TELECOMMUNICATIONS) offer shorter discussions covering more specialized and recent topics. When searching for articles under LegalTrac, Current Law Index, or Index to Legal Periodicals, it is probably best to begin using the terms "telecommunication" and "telephone." The following list annotates recent articles and categorizes them into general subject classifications: AT&T Divestiture and Implications, Articles Discussing the 1987 Greene Decision, F.C.C. Rulemaking and Regulations, State and Local Regulation, Public Policy, Rates and Revenues, Specific Technologies, and Miscellaneous.

A. AT&T Divestiture and Implications

Is Divestiture Working?, John Gantz, TELECOMMUNICATIONS PRODUCTS + TECHNOLOGY, Jan. 1987, at 17.

In this article, John Gantz explores whether divestiture is working. He provides useful statistics and information concerning the effects of deregulation, winners and losers, carrier business, results for vendors, waivers, and strategies for survival. In addition, he briefly examines the various rulings and their future implications.

The Shape of Things to Come, Richard E. Wiley, TELECOMMUNICATIONS, Aug. 1987, at 29.

The author, an attorney and former chairman of the Federal Communications Commission, depicts the restructuring of the telecommunication industry and the new regulatory requirements. He concludes that the aftershocks of the AT&T divestiture are still imminent, and that we are now entering the "Third Wave Restructuring of the Telecommunication Industry."

A Critique of the Huber Report: In Search of the Geodesic Network, Dr. Lee L. Selwyn & W. Page Montgomery, (BUSINESS COMMUNICATIONS REVIEW, May-June 1987, at 23.

Dr. Peter Huber, as a consultant to the DOJ, prepared a comprehensive report on the condition of the former Bell System companies three years after the divestiture. This article criticizes Huber's report which influenced the DOJ recommendations to Judge Greene. The authors believe that Huber's report portrayed a fundamentally flawed view of the technical, economic, and competitive character of the telecommunications industry, and that the DOJ's reliance upon the report was seriously misplaced.

Getting the BOCs Into Long Distance, BUSINESS COMMUNICATIONS REVIEW, Mar.-Apr. 1987, at 32.

The Department of Justice has recommended eliminating the MFJ's line-of-business restrictions against the RHCs entering into information services, manufacturing, other non-telecommunications enterprises, and interexchange long-distance services. In this perspective article, the author argues that Judge Greene should accept the DOJ's recommendation and enter the interexchange long-distance services market subject to listed concerns. The author also suggests specific changes to the DOJ proposal.

Should the RHCs Manufacture?, John Gantz, TELECOMMUNICATIONS PRODUCTS + TECHNOLOGY, Aug. 1987, at 46.

The Department of Justice is promoting the concept that RHCs be allowed to compete by manufacturing telecommunications equipment and Congress seems to concur. In this commentary, John Gantz offers six reasons why the RHCs should not be allowed to manufacture transmission and switching equipment.

Greene Ruling to Touch Many Network Customers, Victor J. Toth, BUSINESS COMMUNICATIONS REVIEW, Jan.-Feb. 1987, at 33.

In this article, the author predicts that proprietary network customers will face dramatic changes in the cost and type of exchange services

used as local and off-network access lines. As a result of several actions before Judge Greene and the F.C.C., multinode network customers are likely to be required to use feature group switched services as the sole means of linking into networks within the local exchange area.

Winning By Losing: The AT&T Settlement and Its Impact on Telecommunications, Paul W. MacAvoy & Kenneth Robinson, 1 YALE J. ON REG. 1 (1983).

This article describes AT&T's subsidization of local service with profits from long-distance services. It then discusses the allegations at issue in the Department of Justice's suit against AT&T along with the terms of settlement, the legal merits of the suit, and the economic consequences of the settlement which allow AT&T to compete more effectively.

Losing by Judicial Policy Making: The First Year of the AT&T Divestiture, Paul W. MacAvoy & Kenneth Robinson, 2 YALE J. ON REG. 225 (1985).

The effects of divestiture one year after the consent decree are analyzed in this article which concludes that divestiture has not worked. Specifically, the article discusses revenue transfers among telephone services existing prior to divestiture. Following a description of developments and failures, the article concludes by proposing goals which the authors argue should be the focus of the post-divestiture telecommunications policy.

Deregulation and the AT&T Divestment: A Competitor's Perspective, Robert D. Alton, 10 WILLIAM MITCHELL L. REV. 501 (1984).

In this short essay, the author advocates that the telecommunication industry "shrug off its regulatory mentality, increase its flexibility, and become more willing to accept risks."

The AT&T Divestment: For Whom Will the Bell Toll?, Kenneth A. Nickola, 10 WILLIAM MITCHELL L. REV. 507 (1984).

In light of the aftermath of divestment, this article describes relevant policy and suggests alternative forms of industry structure. The author based this discussion on Minnesota law and conditions.

Fulfilling the Promise of Divestiture: A Call for Fair and Open Competition, Philip A. Campbell, PUB. UTIL. FORT., Mar. 6, 1986, at 13.

This article reviews regulatory and judicially decreed restrictions imposed on the operation and organization of the regional and local Bell telephone companies. It contends that these restrictions hinder the BOCs' performance and also harm the related consumer interests.

The Demise of the Telephone Network, Alfred W. Duerig, PUB. UTIL. FORT., Jan. 23, 1986, at 30.

The costs and inefficiencies resulting from deregulation in the telecommunications market and the divestiture of AT&T are revealed in this article. In response to these changes, the author considers steps that maximize the benefits for the telephone-using public.

"Baby Bells"—Still Going Strong, Morton L. Brown & Daniel A. Burkhardt, PUB. UTIL. FORT., Jan. 9, 1986, at 41.

This financial news commentary discusses the strong financial position of the seven regional holding companies. It briefly reviews three "baby Bells" (em US West, BellSouth, and Pacific Telesis—and major points of interest concerning each.

The Divestiture of American Telephone & Telegraph Company, Symposium in 9 COMM/ENT 1 (1987).

The Hastings Journal of Communications and Entertainment devoted this issue to topics concerning AT&T divestiture. Overall, this symposium addresses recent issues and provides a helpful background for research in this area. Louis B. Schwartz contributed *Forum and Substance: Introduction to the Symposium*, which discusses the recurrent struggle between AT&T and the antitrust laws. Schwartz presents four criticisms of the MFJ, and advocates that the technical goals of this judgment not overshadow the more important substantive goals. Next is an article entitled *The Modification of Final Judgment: An Exercise in Judicial Overkill*, by Robert B. McKenna and Ronald L. Slyter. These authors contend that divestiture has created an anticompetitive marketplace because it imposes line-of-business restrictions which prevent the regional BOCs from competing with AT&T. They also argue that this judgment created a needlessly bifurcated and duplicative regulatory framework by disregarding contemporaneous pro-competitive regulatory developments propagated by the F.C.C. The third article, written by John R. Worthington, is entitled *The Case for Continued Judicial Enforcement of the AT&T Decree*. This article examines the need for line-of-business restrictions and the dangers of the proposed transfer legislation. It supports enforcement of line-of-business restrictions as necessary to promote competition, and declares attempts to transfer enforcement responsibility to the F.C.C. as unconstitutional and against public policy. The symposium section concludes with James P. Denvir's article, *The Dole Bill: Freeing the Telephone Company Seven?*. While the telecommunications industry is currently subject to overlapping regulation by the F.C.C. and the United States District Court for the District of Columbia, the Dole Bill proposes consolidation of jurisdiction in the F.C.C. The author discusses the Department of Justice position, which supports the consolidation, and examines the potential risks to the regional BOCs.

THE REPORT ON AT&T, Telecom Publishing Group.

In this weekly newsletter, the Telecom Publishing Group provides full coverage of AT&T's new products, long-distance service, international marketing, joint ventures, and regulatory actions.

B. Articles Discussing the 1987 Greene Decision

1. General News Announcing the Decision

These newspaper clippings are marginally useful as research sources but do provide brief descriptions and initial responses to the 1987 Greene decision.

Judge to Ease Information Services Restrictions, S. Mace, INFOWORLD, Sept. 21, 1987, at 11.

Judge Keeps Several Limits on Regional Phone Firms; Some High-Tech Services May Be Permitted, Washington Post, Sept. 11, 1987, at A1.

Most Curbs Retained on 'Baby Bells', Calvin Sims, New York Times, Sept. 11, 1987, at D1, col. 6.

Judge Loosens Grip on Baby Bells Just a Bit; Regional Phone Companies Get a Little More Freedom, but Restrictions Remain, Bruce Keppel, Los Angeles Times, Sept. 11, 1987, at part 4, p. 1, col 5.

Judge Jilts Bells on Key Goals, Elisabeth Horwitt, Computerworld, Sept. 14, 1987, at 1.

2. Implications of the Decision

AT&T—In For the Long Haul, Denis Gilhooly, TELECOMMUNICATIONS, Dec. 1987, at 122.

Denis Gilhooly argues that the 1987 Greene decision was supportive of AT&T's long-term ambitions. He discusses the various players in the telecommunications market and how AT&T intends to "be around for the long haul—in computers, in long-distance, and in equipment manufactur[ing]."

Greene Ruling Shakes Private Transatlantic Fiber Optic Cable Project, Communications Daily, Sept. 24, 1987, at 2. Television Digest, Inc.

This article discusses how Judge Greene's MFJ has affected NYNEX's investment in the Market Link transatlantic cable system.

Home Videotex Gets Shot in Arm from Telephone Ruling, Catherine Arnst, BC Cycle, Reuter Business Report, Sept. 14, 1987.

The focus of this article is on how Greene's 1987 ruling allows telephone companies to provide "gateways" to a local network, enabling users to gain access to services available on a videotex system with a local phone call and at a lower cost.

More Long Distance Firms Arranging for BOC Card Data Base Access, Communications Daily, Nov. 10, 1987, at 3. Television Digest, Inc.

In this article, the author examines the efforts to compete with the BOC card market. A cooperative of long-distance resellers and information service providers has reached an agreement with all twenty-two BOCs. It enables resellers to accept, process, validate, and be billed for BOC Calling Card transactions. Los Angeles-based Operator Assistance Network (OAN) has requested relief from Judge Greene in the bill management area, but Judge Greene and the F.C.C. still have not decided whether data base access pricing should be based on costs or on "what the market will bear."

AT&T Plea on FTS System Rejected, Washington Post, Nov. 9, 1987, at F13; *Baby Bells May Bid Against AT&T*, New York Times, Nov. 7, 1987, at 38; *Judge Greene Approves Martin Marietta Plan for FTS 2000 Switching*, Communications Daily, Nov. 9, 1987, at 3; *Television Digest, Inc; Phone Firms Get OK to Bid Against AT&T*, San Francisco Chronicle, Nov. 7, 1987, at D-22, col 1.

Judge Greene agreed to let regional phone companies bid against AT&T on a \$25 billion government contract. The contract was for the FTS 2000 network which would provide voice, data, video, and dedicated transmission services to government offices throughout the United States, Puerto Rico, the U.S. Virgin Islands, and Guam. AT&T argued that if RHCs provided switching for the FTS 2000 plan administered by Martin Marietta, it would violate the MFJ. Judge Greene allowed Martin Marietta, MCI, and other regional phone companies to bid on the multi-billion dollar contract.

Clash Among Japanese Executives Enlivens International Telecommunications Meeting, Daily Report for Executives, Nov. 2, 1987, at L-5. Bureau of National Affairs, Inc.

The international telecommunications conference was entitled "Pending Changes in Telecommunications Policy: The United States, Europe and Japan." Participants debated the future of deregulation of the U.S. telecommunications industry and the role government should or should not play in its development. This is a brief news story expressing some dissenting views of the Japanese representatives.

Deregulation of U.S. Telecommunications Industry Has Strengthened Its Hand Abroad, Symposium Told, Daily Report for Executives, Oct. 20, 1987, at L-4. Bureau of National Affairs, Inc.

This article discusses how deregulation of the U.S. telecommunications industry has made the industry more efficient domestically which has increased clout internationally. It elaborates some points raised at the international symposium entitled "Pending Changes in Telecommunications Policy: The United States, Europe and Japan."

Worldwide Telecommunications Deregulation Necessary, Greene Says at Telcom 87, Communications Daily, Oct. 23, 1987, at 5. Television Digest, Inc.

A recent statement made by Judge Greene calls for increased competition in telecommunications services worldwide. He criticized the barriers to competition and noted the positive effects of deregulation. Specifically, he praised the French Minitel information service as highly developed and offering substantial public benefit.

C. F.C.C. Rulemaking and Regulations

Will the F.C.C. Free "The Bell Operating Company Seven"?, George Leopold, Electronics, Jan. 20, 1986, at 48.

George Leopold evaluates Computer Inquiry III in this article and asserts that it loosens reins on local phone monopolies.

December 19, 1984—A Big Day in Telecommunications, Michael R. Gardner, 34 CATH. U.L. REV. 625 (1985).

In this short essay, the author focuses on F.C.C. rulemaking in different areas. For example, it discusses telephone access charges and how the F.C.C. revamped the pricing structure for the national telephone systems. In addition, it also discusses how F.C.C. actions regarding Separate Satellite Systems opened the door for privately owned systems.

The Federal Communications Commission and Common Carrier Regulatory Policy: Some Recent Initiatives, PUB. UTIL. FORT., May 15, 1986, at 35.

Three F.C.C. initiatives are examined in this article: (1) a proposal to remove structural separation requirements for the provision of CPE by BOCs; (2) a proposal to separate accounting costs between regulated and unregulated telephone company operations; and (3) guidelines for interim nontraffic-sensitive cost recovery plans. The article provides a good background for issues delineated in Computer Inquiry III.

The Regulatory Burdens of the Bell Operating Companies: Are They Needed?, Jerald N. Fritz, PUB. UTIL. FORT., Apr. 3, 1986, at 25.

This article re-examines the line-of-business restrictions imposed on the BOCs and the F.C.C.'s regulatory requirement that noncarrier competitive businesses are conducted as structurally separate subsidiaries. It reviews the rationales for these restrictions, the changing circumstances, and the possibility of more efficient ratepayer protection through other mechanisms.

Computer III and Independent Value-added Telephone Networks, David A. Reams, PUB. UTIL. FORT., Mar. 20, 1986, at 45.

In this brief commentary the author addresses the three major requirements addressed in Computer III: network interconnection, network disclosure, and accounting requirements. He briefly analyzes the later-imposed regulations.

The F.C.C.'s Path to Deregulation: Turnpike or Quagmire?, Gerald R. Faulhaber, PUB. UTIL. FORT., Sept. 3, 1987.

The author of this article maintains that the gradual, service-by-service deregulation of AT&T is futile and needlessly prolongs the regulatory process. He advocates instead a "social contract" transition period from three to five years, during which the dominant carrier is prevented from raising rates for certain core services by more than a specified percentage.

Regulatory Developments, BUS. COMM. REV., Jan. 1988.

In each January issue of BUSINESS COMMUNICATIONS REVIEW, a summary of major telecommunications-related proceedings at the F.C.C. is presented. This valuable source explains and comprehensively details significant matters facing the F.C.C. In the January/February 1988 issue the following developments were discussed: tariffing reform initiatives, access charges, interstate long-distance service, operator services, Computer III, elimination of structural separation

for the BOCs' provision of CPE (CC Docket No. 86-79), joint and common costs (CC Docket No. 86-111), and F.C.C. jurisdiction.

F.C.C. WEEK, Telecom Publishing Group.

The Telecom Publishing Group provides in-depth reports on key federal regulatory developments concerning the telecommunication industry.

D. State and Local Regulation

Federal and State Roles in Telecommunications: The Effects of Deregulation, Eli M. Noam, 36 VAND. L. REV. 949 (1983).

Eli M. Noam examines the evolution of the traditional federal-state coregulatory system, contrasts the emerging federal regulatory approach with state policies, and discusses reasons for federal predominance in telecommunication regulation. He argues that reorientation is creating administrative problems for states, and concludes that the current coregulatory system is unstable because it necessitates a new intergovernmental consensus that replaces federal dominance.

Federal Preemption of Conflicting Telecommunications Regulations, Laura H. Phillips, 7 GLENDALE L. REV. 141 (1987).

The friction between federal and state statutes and regulatory policy is the subject of this law review article. It surveys the legal rationales for federal assertion of jurisdiction that the F.C.C. has used in the development of a federal telecommunication policy. Then it addresses the practical problems inherent in a jurisdictional analysis under the Communications Act of 1934 and the uncertain impact on recent Supreme Court cases. Finally, the article suggests that federal preemption controversies in this field will be vindicated by federal preemptive authority, provided that the exercise is within the statutory delegation of authority, and is neither arbitrary, capricious, nor an abuse of discretion.

The Present Function of State Regulation of Local Telephone Service, Matthew E. McLogan, PUB. UTIL. FORT., Apr. 16, 1987, at 11.

As a member of the Michigan Public Service Commission, Matthew E. McLogan describes a positive response to the dilemma facing regulators: how to provide effective protections for captive users of monopoly services, while not impeding the spread of competitive benefits—new and additional uses of the local exchange network—to the largest possible number of customers. To summarize, he calls for a transitional regulatory scheme that protects monopoly ratepayers while pursuing policies which allow competitive benefits to reach the widest possible number of customers.

New Choices for Intrastate Long Distance Services, Michael T. Hills, BUS. COMM. REV., Sept.-Oct. 1987, at 17.

Since tracking the activities of each carrier from state to state can be complex and expensive, this article summarizes the major trends occurring in the interstate market.

STATE TELEPHONE REGULATION REPORT, Telecom Publishing Group.

In their newsletter, the Telecom Publishing Group details statutory regulatory actions and cases at the state level.

E. Public Policy

"Back to the Future": A Model for Telecommunications, Mark S. Fowler, Albert Halprin, & James D. Schlichting, 38 FED. COMM. L.J. 145 (1986).

The authors of this article urge a re-examination of government regulation in the telecommunications industry. They offer a broad proposal encouraging active participation by industry, users, and especially state regulatory commissioners. Before arriving at this proposal, they explore goals, the public utility paradigm and its breakdown, the competitive industry paradigm, and the regulatory problems of an asymmetric transition.

A Public Policy Goal: Preserving Public Confidence, Timothy E. Wirth, PUB. UTIL. FORT., Jan. 23, 1986, at 15.

United States Representative from Colorado Timothy E. Wirth cites the important relationships between the telecommunications industry and the financial market—both of which have been marked by significant economic volatility. He emphasizes the need to re-examine public policy goals in order to preserve confidence in our system of raising capital and to nurture a partnership between the public and private sectors.

Social Contract Regulation Is a Bad Bargain for Ratepayers, Jack L. Landau, PUB. UTIL. FORT., July 9, 1987, at 21.

Jack L. Landau argues that the concept of social contract regulation is flawed in many respects. Focusing on the telephone industry, he identifies the legal impediments, policy problems, and questionable assumptions upon which the theory is based. He believes that regulators should examine other methods to achieve the twin goals of providing regulatory flexibility while protecting ratepayers from unreasonable rate increases.

F. Rates and Revenues

The Effect of Deregulation on AT&T's Pricing, Penny L. Sedgley & Larry J. Cody, PUB. UTIL. FORT., Nov. 26, 1987, at 34.

In this article, the authors summarized the purpose, method, and findings of a study conducted by staff members of the Virginia State Corporation Commission. The study focused on the pricing of intra-state services by AT&T Communications subsidiary companies in eleven states during the period from January, 1984, to March 1, 1987. The eleven states were chosen as representative of varying degrees of regulatory control, ranging from conventional rate base and rate-of-return regulation to complete deregulation. While the authors found it difficult to draw firm conclusions about the effects of varying degrees of regulation or deregulation on AT&T's prices, they concluded that AT&T's pricing behavior in Virginia under deregulation indicates progress towards competition.

The Globalization of Telephone Pricing and Services, Peter Cowhey, TELECOMMUNICATIONS, Jan. 1988, at 39.

Peter Cowhey discusses how the experiments in national regulatory reform and the intergovernmental negotiations on the organization of the global telecommunication market have significant implications for local exchange carriers in the United States. The article elaborates on the effects of internationalization and current international negotiations.

Price Theory and Telecommunication Regulation: A Dissenting View, Basil L. Copeland, Jr. & Alan Severn, 3 YALE J. ON REG. 53 (1985).

This article assesses the applicability of the static price theory to market conditions currently confronting local operating companies. It challenges the theory that structural reform in telecommunications is necessary to achieve economic efficiency, particularly in intraLATA markets. Finally, it recommends that regulators view with skepticism arguments derived from price theory that justify departure from the historic pricing theory.

Telephone Lifeline Rates After the AT&T Divestiture, PUB. UTIL. FORT., June 12, 1986, at 57.

In this article the author describes how the imposition of access charges and the concomitant increase in local exchange rates resulting from the divestiture decree have affected the lifeline rates for telephone service. It reviews jurisdictional questions and other related questions involving lifeline rates.

The Truth About Telephone Company Diversification, Edwin B. Spievack, PUB. UTIL. FORT., May 15, 1986, at 13.

This article warns that loosening the restrictions on the regional BOC operations in businesses other than local telephone exchange service may not benefit local telephone users. The author argues that telephone users are likely to find themselves providing revenues for regional companies which are used to support other non self-sustaining business activities.

Telephone Company Capital Recovery: Crisis and Dilemma Persist, Joseph R. Fogarty, PUB. UTIL. FORT., Feb. 6, 1986, at 23.

Adequate capital recovery and consistent depreciation methods are essential to modern telephone company operations in a competitive market, according to this author. He identifies the causes of deficient depreciation reserves and explores the prospects for policy reform.

Transition to Telecommunications Competition Amid Residual Regulatory Obligations, Dennis L. Weisman, PUB. UTIL. FORT., Aug. 6, 1987, at 14.

The market distortions caused by the provision of uncompensated default network capacity ("carrier-of-last-resort service") by the local exchange carriers are discussed in this article. It proposes as a solution the levying of flat rate default network capacity charges on bypassers who choose to rely on the carriers' network for emergency or backup service.

Coping with Access Charges on Data Information and Enhanced Services Providers, Victor J. Toth, BUS. COMM. REV., Sept.-Oct. 1987, at 35.

In July 1987 the F.C.C. announced its intention to extend its access regime to encompass noncarrier providers of enhanced services. (Notice of Proposed Rule Making, CC Docket No. 87-215). This column offers suggestions for minimizing the impact of this new rule which took effect on January 1, 1988.

Private Line Access Charges—A Lesson in Shooting Yourself in the Foot, Victor J. Toth, BUS. COMM. REV., Jan.-Feb. 1988, at 36.

On November 24, 1987 the F.C.C. threatened to extend its access regime to include private line and private network customers. Early customer response bitterly reacted to the prospect of increased rates. The author, however, suggests that the potential net impact will not be very severe, and the proposal could actually lower costs and increase functionality. This article discusses pertinent issues and who will be the winners and losers.

G. Specific Technologies

1. Centrex

A New Factor in RHC's Long-Term Strategies, Barry L. Marks, TELECOMMUNICATION PRODUCTS + TECHNOLOGY, Aug. 1987, at 51.

Barry L. Marks discusses Centrex Systems which are voice switching systems for large users. He explains the large contribution to the resurgence of Centrex by the regional Bell holding companies (RHCs), and how these RHCs have embraced Centrex as a key element in their long-term strategies.

2. Equipment

Telecom Equipment Markets: Life in Flatland, John Gantz, TELECOMMUNICATIONS PRODUCTS + TECHNOLOGY, Apr. 1987, at 37.

This article briefly discusses the telecommunication equipment markets and analyzes delayed capital spending and market trends. It contends that the equipment markets are likely to level off and enter a period of decline, which indicates that a shift to a buyer's market is imminent.

3. ISDN and Standards

Standards in the Telecommunications and Computer Industries: Some Emerging Legal Issues, John G. Lamb, Jr., 4 COMPUTER LAW. 14 (1987).

In this article John Lamb summarizes some of the events which are responsible for the increased emphasis being placed on computer standardization, briefly explains how standards have been adopted in the past, discusses some of the traditional legal issues surrounding adoption of standards, and finally, isolates some emerging trends concerning computer and telecommunications standardization.

ISDNs: Shaping the New Networks that Might Reshape F.C.C. Policies, Comment, 37 FED. COMM. L.J. 171, (1985).

The questions that the F.C.C. proceedings raise regarding ISDNs in light of domestic policies toward ISDN are the focus of this Comment. It begins by discussing general technology and the expected impact of these F.C.C. proceedings. Then it describes the efforts of the United States to develop international standards, and the implementation and implications of these standards.

Fourteen Things You Should Know About ISDN, Tom Valovic, TELECOMMUNICATIONS, Dec. 1987, at 67.

Tom Valovic presents fourteen key issues that end users should be aware of as ISDN continues to emerge as a dominant standard. It mentions concerns of the BOCs and is a useful article for demystifying the various "flavors" of ISDN and the relevant concerns.

4. Networks

Recent Telecommunications Developments Affecting Computer Networks, Warren G. Lavey, 2 COMPUTER LAW. 1 (1985).

This article discusses the regulation of data communications services and equipment, and how this plays a critical role in determining the configurations of computer networks, their ability to meet certain demands, the attractiveness of certain products, and who supplies which components. It focuses on three overlapping areas of regulatory developments: "basic" services used for data transmission, customer-premises computer equipment interconnected with common carriers' lines, and enhanced services.

5. ONA

Why the BOCs Should Provide an ONA-Based Information Fabric, A.M. Rutkowski, TELECOMMUNICATIONS, Sept. 1987, at 108.

The author of this article narrates testimony before the U.S. House of Representatives' Subcommittee on Telecommunications and Finance concerning telecommunications policy. The author argues for growing technological leadership in the U.S. that will allow information services to flourish, and offers specific recommendations on how to achieve this goal.

6. Transborder Data Flow

Impact of Transborder Data Flow Restrictions on Cash Management Services, Fred M. Greguras, 1 COMPUTER LAW. 10 (1984).

In this article Fred Greguras examines the transborder data flow of cash management services including the types of activity, government objectives, privacy issues, national security, economic welfare, protection of domestic industries and public monopolies, and actions and trends throughout the world. He concludes that governmental restrictions could have serious negative consequences, that a minimum level of privacy/data protection rights should be created,

and that substantial investments must be made in long-term planning and management of these systems.

Business Secrets Across International Borders: One Aspect of the Transborder Data Flow Debate, T. Murray Rankin, 1 *COMPUTER L. & PRACTICE*, Mar.-Apr. 1985, at 106.

This article examines the extent to which various standards of business secrecy and disclosure may constitute non-tariff barriers to trade in information services. Specifically, it analyzes varying business secrecy protection in the context of Transborder Data Flow, the impact of data protection laws on international business, and the degree of protection granted business information in the United States and Canada, as well as providing some reform proposals.

7. *Bypass Technologies*

Targeting Bypass Technologies, Leslie Townsend, *TELECOMMUNICATIONS PRODUCTS + TECHNOLOGY*, Feb. 1987, at 21.

Through bypass, consumers are replacing public communication links with private systems. This article discusses recent bypass technologies including T1 multiplexers, SDN (Software-Defined Networks) and two-way VSATs (Very Small Aperture Terminals). It also briefly covers the BOC responses to bypass.

Whatever Happened to Bypass?, George Pfister, *BUS. COMM. REV.*, Mar.-Apr. 1987, at 12.

While the controversy over bypass has been stirred up by the RHCs in the trade press and in conferences, the actual amount of bypass has been relatively small. This article seeks to define some of the underlying factors that have combined to limit the amount of bypass and suggests that many of these barriers are likely to remain.

H. *Miscellaneous*

A Narrow, Misinformed Court Victory for the Bell Operating Companies, Warren G. Lavey, 3 *COMPUTER LAW*. 8 (1986).

On August 15, 1986, a D.C. Circuit Court of Appeals opinion regarding extraregional exchanges services ruled that the 1982 consent decree does not impose geographic restrictions on the BOCs' exchange services. *United States v. Western Electric Co.*, 797 F.2d 1082 (D.C. Cir. 1986) (Buckley, J.). This article explores the restrictions on extraregional information services in light of the decision.

The Private Pay-Phone Business is a Sleeper, John Gantz, *TELECOMMUNICATIONS PRODUCTS + TECHNOLOGY*, Mar. 1987, at 54.

Thus far the pay-telephone's deregulated status has been slow to affect profits. The author forecasts, however, that these devices offer the potential for high returns at a low risk.

Scaling the Heights of the PTTs, John Walko, *TELECOMMUNICATIONS PRODUCTS + TECHNOLOGY*, Apr. 1987, at 19.

Compared to the United States, deregulation in Europe is much further behind. Currently, government monopolies control network

services and the range of business products. While Britain has moved towards deregulation, most PTTs (Post, Telegraph and Telephone authorities) are struggling to hold onto their monopoly position.

The Rewiring of America: Scenarios for Local-Loop Distribution, Tom Valovic, TELECOMMUNICATIONS, Jan. 1988, at 30.

As new fiber transmission broad-band ISDN technologies develop, attention shifts from interexchange carrier trunks to local-loop facilities. These facilities are potentially the most economical and efficient means of distributing broad-band services (i.e. voice, data, video, and combinations thereof) to a wide range of residential subscribers currently served by twisted-pair local-loop facilities. This article summarizes key issues that surfaced in a seminar at MIT involving representatives from the major forces within the telecommunications industry.

Embarking on Our Third Decade, TELECOMMUNICATIONS, Aug. 1987, at 27.

This special section of TELECOMMUNICATIONS concentrates on the future of telecommunications. It provides a useful summary divided into history/regulation, technology, and user's views, includes a valuable perspective of evolving technologies, and concludes with an article entitled "Telecommunication in the Year 2000."

US Decisions on Pacific Telecommunications Facilities: Letting a Million Circuits Bloom?, Timothy J. Logue, 27 JURIMETRICS J. 65, Fall 1986.

In this article, three 1985 decisions having a decisive effect on telecommunication development in the Pacific region are discussed. The first concerns F.C.C. approval of United States carrier participation in construction of the Han 4 Transpac-3 undersea fiberoptic cable. The other two discuss approval of policies regarding private undersea cables and international satellites. Essentially, it asserts that these large investments result in increased capacity which can lead either to increased tariffs or a reduction of tariffs with the hope of a corresponding increased demand.

Universal Telephone Service and Competition: The Rural Scene, Joseph Gillan, PUB. UTIL. FORT., May 15, 1986, at 22.

This article discusses obstacles to bringing competitive long-distance telecommunications service to rural areas. It develops the policy rationale for promoting competitive entry to the rural market, and then describes an existing project in this setting.

Electric Utilities in Commercial Telecommunications—Does It Make Sense?, Samuel C. Sciacca, PUB. UTIL. FORT., May 15, 1986, at 18.

Samuel C. Sciacca considers why utilities are attracted to diversify into the telecommunications field following deregulation and AT&T divestiture. He addresses the various levels of participation by the utilities, the risks, and other relevant concerns.

The Bypass of Local Telephone Facilities: How Serious a Threat, PUB. UTIL. FORT., May 1, 1986, at 49.

In this article the author identifies how bypass—the provision of telephone services by means other than the facilities of the

established local exchange carriers — threatens a loss in revenues and the various responses to this problem.

The Changing Nature of Communications Law Practice, Stuart N. Brotman, 9 COMM/ENT 179 (1987).

The evolution of communications law practice over the past fifty years is outlined in this article. The author discusses how lawyers have adapted their practices to serve increasingly complex client needs. The communications law practice previously emphasized the lawyer's skill in administrative adjudications. Gradually the focus shifted to the quasi-legislative activities found in the informal rulemaking process. During the 1960s, attention shifted from the F.C.C. to the courts as a result of appellate litigation initiated by public-interest advocates. Finally, the author describes how business negotiation skills and traditional modes of advocacy are currently being emphasized.

Who is a "Common Carrier" or "Carrier" Within the Meaning of § 3(h) of the Communications Act of 1934 (47 USCS § 153(h)), 46 A.L.R. Fed. 626 (1980).

In this annotation, A.L.R. collects and analyzes the federal court cases, decisions, and F.C.C. reports that have construed the meaning of the terms "carrier" or "common carrier" as used in § 3(h) of the Communications Act of 1934. It is an invaluable source of information on this limited topic which provides a link into the Lawyers Co-operative network of sources.

Antitrust Immunity Under Federal Communications Act of 1934 (47 USCS §§ 151 et seq.) of Communications Carriers for Acts Involving Interconnections With Other Communications Carriers and Equipment, 59 A.L.R. Fed. 239 (1982).

This A.L.R. annotation compiles federal cases in which the courts determined whether communications carriers were entitled to anti-trust immunity under the Communications Act with respect to the establishment or refusal to establish physical connections with other carriers or to interconnect equipment made by other telecommunication manufacturers. It is a very useful, informative source on this particular subject.

INTERNATIONAL COMMUNICATIONS WEEK and BOC WEEK, Telecom Publishing Group.

International Communications Week provides news and developments on international telecommunications services, policy, and equipment trade, as well activities of the ITU, OECD, and GATT. BOC WEEK regularly covers products and services provided by the BOCs.

VII. PUBLIC AND PRIVATE ORGANIZATIONS

A. Government Agencies

1. *Federal Communications Commission*

Background

The F.C.C. is responsible for regulating all interstate and foreign communications by means of radio, television, wire, cable, and satellite. Following the AT&T divestment, the F.C.C.'s role in regulating the telephone industry is likely to diminish over the long run. In the short run, however, the F.C.C. is expected to remain heavily involved in shaping the post-divestiture telephone industry. The commission continues to regulate AT&T's long-distance tariffs, rate of return, rate of depreciation, and corporate structure, as well as regulating the interstate operations of the BOCs. Moreover, the F.C.C. is responsible for reallocating the costs of telephone service between local and long-distance companies and ensuring that consumers using long-distance service provided by AT&T's competitors have equal access to the national long-distance switching network. In 1985, the Commission imposed access charges on local customers to reimburse local phone companies for providing the equipment that connects customers to the long-distance network. The Commission also presided over the state-by-state conversion of the long-distance system from one that favored AT&T to one in which all long-distance companies received a share of the market. To help deal with the problems of allocating costs and providing universal service, the F.C.C. established the Joint Board, composed of three F.C.C. commissioners and four state regulatory officials.

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Chairman (202) 632-6600
Congressional Liaison (202) 632-6367
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Freedom of Information (202) 632-6990
General Counsel (202) 632-7020
Public Information (202) 632-7000
Library (202) 632-7100
Recorded Information (202) 632-0002

Publications

Information Services and Publications—includes a list of publications and details on prices and how to order; available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; (202) 783-3238

Annual Report—summarizes commission actions, major decisions, and legislation; and appendices contain detailed information and statistics on broadcasters and common carriers including financial data, applications, license revocations, and complaints.

F.C.C. Rules and Regulations by Categories—contains regulations arranged under subject headings.

F.C.C. Reports—pamphlets issued weekly, containing decisions, reports, public notices, and other documents of the F.C.C. Available on a subscription basis and bound periodically.

2. *Department of Justice*

Background

The Department of Justice (DOJ) has been instrumental in initiating divestiture of AT&T. The Antitrust Division is the unit within the Justice Department responsible for investigating and prosecuting cases under federal antitrust law. In November 1974, the Antitrust Division charged AT&T, Western Electric, and Bell Laboratories under the Sherman Act with conspiracy to monopolize the telecommunications industry. In January 1984, the divestiture was completed, and Judge Greene commissioned the Antitrust Division to produce a triennial report examining competition in the telecommunications industry.

Address

10th St. & Constitution Avenue, N.W.
Washington, DC 20530

Telephone Numbers (Antitrust Division):

General Information, Mark Sheehan, (202) 633-2007
Assistant Attorney General, Charles F. Rule, 633-2401
Deputy Assistant Attorney General, Frederick R. Warren-Boulton, 633-2408
Economic Litigation Sec. Chf., Jon M. Joyce, 724-6665
Economic Regulation Sec. Chf., Curtis Jernigan, 724-6332
Policy & Leg-Exec Ofcr., Ralph J. Justis, 633-2421
Antitrust Library, room 3310, Roger Karr, 633-2431

3. *Congressional Committees*

HOUSE ENERGY AND COMMERCE COMMITTEE

Subcommittee on Telecommunications and Finance; Edward J. Markey, D-Mass., chairman; Larry Sidman, chief counsel and staff director; H2-316 Annex 2, Washington, D.C. 20515; (202) 226-2424

SENATE COMMERCE, SCIENCE AND TRANSPORTATION COMMITTEE

Subcommittee on Communications; Daniel K. Inouye, D-Hawaii, chairman; Thomas Cohen, senior counsel, 227 Hart Senate Office Building, Washington, D.C. 20510; (202) 224-9340

B. Private Organizations

COMPETITIVE TELECOMMUNICATIONS ASSOCIATION (COMPTEL), 120 Maryland Ave., N.E., Washington, D.C. 20002; (202) 542-9022.

COMPUTER AND BUSINESS EQUIPMENT MANUFACTURERS ASSOCIATION (CBEMA), 311 First St., N.W., Suite 500, Washington, D.C. 20001.

COMPUTER AND COMMUNICATIONS INDUSTRY ASSOCIATION (CCIA), 666 11th St., N.W., 6th Floor, Washington, D.C. 20001; (202) 783-0070.

FITCH INVESTORS SERVICES, 5 Hanover Square, New York, New York 10004; closely monitors developments at the Bell RHCs and considers rating actions on a case-by-case basis. Bruce Hyman, (212) 668-8455.

MCI COMMUNICATIONS CORPORATE NEWS BUREAU, 1133 19th St. N.W., Washington, D.C. 20036; (202) 887-3000.

NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (NTIA), Office of Policy Analysis and Development, NTIA, Suite 4725, U.S. Department of Commerce, Washington, D.C. 20230; (202) 377-1880.

NATIONAL TELEPHONE COOPERATIVE ASSOCIATION (NCTA), 2626 Pennsylvania Ave., N.W., Washington, D.C. 20037; (202) 298-2300.

NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION (NATA), 2000 M. St., N.W., Suite 550, Washington, D.C. 20036; (202) 296-9800.

SOCIETY OF TELECOMMUNICATIONS CONSULTANTS (STC), One Rockefeller Plaza, Suite 1410, New York, NY 10020; (212) 582-3909.

TELECOM PUBLISHING GROUP, 1101 King St., Suite 444, Alexandria, VA 22314; 1-800-327-7205.

TELECOMMUNICATIONS RESEARCH AND ACTION CENTER, P.O. Box 12038, Washington D.C. 20005; (202) 462-2420.

BOOKS RECEIVED

The books listed below have been received by *High Technology Law Journal* over the past year. The books are cataloged by subject and are listed alphabetically by title within each subject area. Each annotation begins with a citation to the book received, including publisher and price information. All prices are for cloth editions except where noted.

I. COMPUTER & ELECTRONICS LAW

A. Computer Technology and Law

COMPUTER APPLICATIONS IN THE LAW by Peter B. Maggs and James A. Sprowl. St. Paul, Minnesota: West Publishing Company, 1987. Pp. xxix, 316; \$28.95, \$19.95 (disk).

This book, part of West Publishing Company's Basic Legal Text Nutshell Series, introduces law students and lawyers to the use of computers in a law practice and provides a good hands-on presentation of law office computer possibilities. No prior reader knowledge of computers is assumed by the authors. Initially, a sociological backdrop to the use of computers in the law is presented, and then the text proceeds on a chapter by chapter exploration of a variety of applications for computers in the law such as word processing, document management, legal research, programming, communications, and accounting. The book contains IBM compatible software which can be used in conjunction with the text to gain practical experience. The detailed appendix walks the reader through the LawWord, LawSpread, LawComm, and PCMail programs. In addition, this book contains a glossary of computer related terms.

THE MICROELECTRONICS RACE: THE IMPACT OF GOVERNMENT POLICY ON INTERNATIONAL COMPETITION by Thomas R. Howell, William A. Noellert, Janet H. MacLaughlin, and Alan Wm. Wolff. Boulder: Westview Press, Inc., 1988. Pp. xxi, 278; \$ 27.50 (paper).

As part of the publisher's Economic Competition Among Nations Series, THE MICROELECTRONICS RACE analyzes the effect of government policies on the international competitiveness of their domestic microelectronics companies. Initially, the study examines and compares the government policies of Japan and the United States and the effect such policies have had on the relative international competitiveness of each country's microelectronics industry. In later sections the authors explore current efforts in Korea and Europe to implement comparable measures, and conclude with an analysis of U.S. policy alternatives.

B. Artificial Intelligence

AN ARTIFICIAL INTELLIGENCE APPROACH TO LEGAL REASONING by Anne von der Lieth Gardner. Cambridge, MA: The M.I.T. Press, 1987. Pp. xiii, 225; \$25.00.

This book discusses and analyzes the author's computer model of the legal reasoning process. Initially, the author explores several aspects of the legal reasoning process, and then suggests a framework which attempts to capture this process. Finally, the author compares the resulting framework with those used by other legal analysis programs in addition to exploring current artificial intelligence techniques.

MICROCOMPUTERS AS DECISION AIDS IN LAW PRACTICE by Stuart S. Nagel. New York: Quorum Books, 1987. Pp. xxvi, 358; \$45.00.

This book explores potential uses of a personal computer as a component of legal decision making. After an informational section discussing general microcomputer materials and currently available decision-aiding software, the author focuses on the use of personal computers in judicial prediction, litigation choices, allocation of law firm resources, and negotiation and mediation.

C. Legal User's Guides

HOW TO COPYRIGHT SOFTWARE: EVERYTHING YOU NEED TO COPYRIGHT ALL TYPES OF COMPUTER PROGRAMS AND OUTPUT by M. J. Salone. Berkeley: Nolo Press, Second Edition, 1987. Pp. 223; \$24.95 (paper).

This manual, written primarily for programmers and software developers, explores copyright in layman's terms. After an initial introduction to copyright law, the manual concentrates on the practical steps necessary for securing copyright protection for software and other computer output. The final chapters explore various remedies for copyright infringement, the implications of international copyright laws and additional legal protections applicable to software. Several sample completed copyright forms are included in the appendix.

LEGAL CARE FOR YOUR SOFTWARE: A STEP-BY-STEP GUIDE FOR COMPUTER SOFTWARE WRITERS AND PUBLISHERS by Daniel Remer & Stephen Elias. Berkeley: Nolo Press, Third Edition, 1987. Pp. 352; \$29.95 (paper).

This "self help" law manual presents an overview of legal concerns facing software developers and publishers including intellectual property rights (copyright, trade secret, patent, and trademark protections), contract negotiating and drafting, and other related issues. This third edition includes discussions of recent legal developments in these areas. As in previous editions, a wealth of sample forms and contracts accompany the text. As the book is targeted toward a lay audience (primarily software developers) few references are made to statutes or other legal materials, therefore it is limited as a research tool. (A previous edition of this manual was annotated in 1 HIGH TECH. L.J. 595 (1987).

D. Tax Issues

ACCOUNTING AND TAX ASPECTS OF COMPUTER SOFTWARE MANUFACTURING by Robert W. McGee. New York: Praeger Publishers, 1987. Pp. viii, 155; \$35.95.

This book presents a comprehensive overview of the accounting and taxation issues which surround computer software. The book begins with a discussion of financial accounting issues and then proceeds to an exploration of federal and state tax aspects of computer software including discussions of investment tax credits, research credits, and sales, use, and property taxation.

II. BIOTECHNOLOGY

BIOTECHNOLOGY AND THE ENVIRONMENT: INTERNATIONAL REGULATION by Jeffrey N. Gibbs, Iver P. Cooper, and Bruce F. Mackler. New York: Stockton Press, 1987. Pp. 339. \$160.00.

This book discusses the current regulatory policies of twelve countries with respect to the environmental effects of the biotechnology industry. The first thirteen chapters provide an overview of the United States' regulatory scheme, including such topics as the division and coordination of regulation among federal agencies (EPA, USDA, NIH, and FDA), state and local regulations, and private control mechanisms in the form of environmental and product liability litigation. The next eleven chapters cover the regulation of the environmental aspects of biotechnology in the United Kingdom, Australia, Austria, Canada, Denmark, West Germany, France, Ireland, the Netherlands, New Zealand, and Switzerland. Finally, there is a brief discussion of attempts to regulate the biotechnology industry through international forums such as the European Economic Community and the Organisation for Economic Co-operation and Development.

BIOTECHNOLOGY: FEDERAL REGULATION 1986 edited by CCH Editorial Staff. Chicago: Commerce Clearing House, Inc., 1986. Pp 302; \$10.00 (paper).

This book brings together documents relating to the regulations governing biotechnology processes utilized by the food and pharmaceutical industries. Included are Policy Statements, NIH and FDA Guidelines, Points to Consider, and other miscellaneous related materials.

CLONING AND THE CONSTITUTION: AN INQUIRY INTO GOVERNMENTAL POLICYMAKING AND GENETIC EXPERIMENTATION by Ira H. Carmen. Madison: University of Wisconsin Press, 1985. \$22.50.

The author explores potential application of the First Amendment protection of "expression" to genetic engineering and the effect this relationship would have on government policymaking.

HUMAN EMBRYO RESEARCH: YES OR NO? by the Ciba Foundation. New York: Tavistock Publications, 1986. Pp. xv, 232; \$39.95.

This book records the comments of scientists, doctors, and jurists who attended the 1985 Ciba Foundation forum on human embryo research. Following an introductory exploration of the legal issues which surround this field, various scientific aspects of human embryo research are discussed in detail. In addition, religious attitudes and public opinion toward the use of human embryos in scientific research are examined.

INTELLECTUAL PROPERTY RIGHTS IN BIOTECHNOLOGY WORLDWIDE by Stephen A. Bent, Richard L. Schwaab, David G. Conlin, and Donald D. Jeffery. New York: Stockton Press, 1987. Pp. xx, 640; \$150.00.

This treatise aims to provide attorneys, business managers, and researchers with an understanding of the legal principles governing the protection of biotechnology property rights internationally. It begins with a discussion of the theoretical and historical development of biotechnology proprietary rights, followed by a summary of current patent protection for biological inventions in Europe, Japan, and the United States. Subsequent chapters analyze issues regarding biotechnology rights based on patents and trade secrets. The final chapters deal with the impact of existing treaties and regulatory schemes on biotechnology property rights worldwide and details of patent and trade secrecy protection in specific countries. This treatise proposes an internationally uniform analytical framework for protection of biotechnology inventions worldwide and imparts to practitioners valuable guidance for protecting a broad range of biological developments in thirty-seven countries.

III. TELECOMMUNICATIONS

A BIBLIOGRAPHY OF TELECOMMUNICATIONS AND SOCIO-ECONOMIC DEVELOPMENT by Heather E. Hudson. Boston: Artech House, Inc., 1988. Pp. xviii, 241; \$40.00 (paper), \$60.00 (disk).

This bibliography compiles a variety of resource materials which explore the relationship of telecommunications to economic and social development. Over 1100 entries are included which provide information regarding the author, title, publisher, or periodical, and limited key word references on each of the resources. Entries are organized only by author and no annotations of the works are provided. A disk version of the bibliography in dBase III is available from the publisher for use on IBM XT, AT, or compatible machines.

THE LAW AND REGULATION OF INTERNATIONAL SPACE COMMUNICATION by Rita Lauria White and Harold M. White, Jr. Boston: Artech House, Inc., 1988. Pp. xxviii, 309; \$60.00.

This comprehensive study traces the origin and development of the international regulation of space communication. Part I presents historical and technical background information on the regulation of

radio communication and geostationary satellite orbit, and the development of the International Telecommunications Union (ITU). Part II explores the current structure of the space communication law-making process of the ITU. Part III details various international space conferences from 1959 to 1985, and Part IV focuses on special space communication topics. In addition, the book provides a very useful glossary, bibliography, and index.

IV. SCIENCE AND THE LAW, AND OTHER ISSUES

ENERGY IN EUROPE: ISSUES AND POLICIES by Thomas G. Weyman-Jones. New York: Methuen & Co., 1986. Pp. xii, 176; \$55.00.

This book studies how the energy crises of the 1970s and 1980s affected the European community. The author examines the economic impact of oil price fluctuations on Europe and the resulting governmental energy policies including conservation efforts and oil pricing policies. In addition, the economic, political, and social impact of the development of nuclear power and other alternative energy sources are analyzed.

FORGING THE ATOMIC SHIELD: EXCERPTS FROM THE OFFICE DIARY OF GORDON E. DEAN edited by Roger M. Anders. Chapel Hill: University of North Carolina Press, 1987. Pp. xxxix, 309; \$27.95.

This book contains excerpts from the recently declassified office diary of Gordon E. Dean who served as chairman of the United States Energy Commission from 1950 - 1953. The diary is primarily comprised of notes taken from telephone conversations which provide a unique inside view of the early days of government policy-making in the field of atomic energy. It includes Dean's accounts of pressing issues before the commission including the development of the hydrogen bomb, the Korean War, the decision to conduct atmospheric tests in the United States, and the development and testing of the first thermonuclear device.

IDEAS IN THE WORKPLACE: PLANNING FOR PROTECTION by H. Clarke Anawalt. Durham, NC: Carolina Academic Press, 1988. Pp. vii, 154; \$17.95.

IDEAS IN THE WORKPLACE is an intellectual property primer for employers and employees which seeks to explain "which ideas are protectable and how protection is achieved." The author introduces the reader to the laws of patent, copyright, and trade secrets, and explores how these topics relate to employment law. The final chapter presents planning suggestions and sample contracts.

IF WE CAN KEEP A SEVERED HEAD ALIVE...: DISCORPORATION AND U.S. PATENT 4,666,425 by Chet Fleming. St. Louis: Polynym Press, 1988. Pp. xxxiv, 461, \$12.95.

Chet Fleming, a scientist/engineer and attorney explores the ethical, religious, and legal consequences of the application of U.S. Patent 4,666,425 "Device for Perfusing an Animal Head" to humans. After

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