

**Texas Intellectual Property Law Journal**  
Winter, 1992

Note

INTERNATIONAL PROTECTION OF INTELLECTUAL PROPERTY

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**I. Introduction**

The protection of United States interests in intellectual property abroad represents a critical issue in the future of the nation's economy. As the United States share of the world markets for manufactured goods declines,<sup>1</sup> the importance of exports in other sectors increases. Specifically, exports in computer software, biotechnology and semiconductors have increased substantially over the last ten years.<sup>2</sup> The United States has long been a leader in the production of new technology--an export increasingly crucial in the long-term balance of trade. Unfortunately, this type of export is particularly susceptible to misappropriation due to the ease of piracy, estimated to cost United States industry well in excess of \$50 billion annually.<sup>3</sup> Consequently, the international laws of intellectual property which proscribe this \*42 activity are essential to the security of the technology export sector.

Persistent and successful appeals in world forums for changes in the climate of foreign law and enforcement practices must be made to ensure that consistent, robust growth in United States exports in this sector remains secure. Inevitably, many nations are reluctant to implement such changes on the ground that enhanced protection for foreign intellectual property represents draconian economic policy. Despite other nations' objections, multilateral trade negotiations and bilateral negotiations represent the most practical and effective means for the United States to compel these changes. Furthermore,

domestic policy initiatives would substantially enhance United States competitiveness in these areas.

#### ***A. Intellectual Property Law***

The law of intellectual property vests protection in three general areas: trademarks, patents, and copyrights.<sup>4</sup> The protection of trademarks promotes reliability in identification of consumer products by providing penalties for infringement of registered marks. Patent protection promotes new discoveries to aid the public<sup>5</sup> through the grant of a monopoly on inventions limited to a term of years, after which the protected invention enters the public domain.<sup>6</sup> In general, patent laws serve two functions: (1) to stimulate research by providing researchers with a seventeen year monopoly on their innovations,<sup>7</sup> and (2) to foster economic benefits for society.<sup>8</sup> Likewise, copyright law encourages artistic and literary creativity for the ultimate benefit of the general public<sup>9</sup> through protection of the creator's rights to the original work for a limited span of time.

Currently, domestic protection for intellectual property is provided primarily through federal statutory law. For example, the legislative power to create patent law is derived from the Constitution, which permits Congress "to promote the Progress of Science and the useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."<sup>10</sup> Although this section does not explicitly grant power to protect trademarks, power to do so has been derived from the Commerce clause<sup>11</sup> empowering Congress to regulate interstate commerce, culminating in the current federal trademark statute, the Lanham Act.<sup>12</sup> The Patent Act,<sup>13</sup> founded in the \*43 purposeful language of the Constitutional framers, is not limited by the scope of interstate commerce. The Copyright Act of 1976<sup>14</sup> constitutes the primary statutory basis for the law of copyright, which, in general, grants exclusive rights to the copyrighted work for the life of the author plus 50 years. This body of law currently provides the most important basis for protection of computer software,<sup>15</sup> an important new export from the United States.

#### ***B. Computer Programs as Technology***

Computer programs are technology for using computers.<sup>16</sup> Simply, the logic circuitry of the microprocessor forms a rudimentary device with a specific instruction set that can be executed by that computer--the most basic instruction level in the machine. Programs at this level are said to be written in object code. Eventually, every program that is to be run on the machine must be transformed into object code in order for the program to be executed on the machine. Although in principle programs can be written directly in object code, this is, in fact, rarely done in practice because the process of writing in object code is quite tedious. In the general case, programs called the operating system accommodate the more mundane tasks while allowing the machine to utilize other programs written at a higher level of abstraction. Compiler programs define higher-level, more abstract languages in which application programs are normally written. Programs written in these higher-level languages are called source code. The application programs combine with the operating system to allow the general purpose computer to function as a special purpose machine (such as a word processor, spreadsheet, or video game).

When a program is loaded in executable form in the memory of a computer, the code is represented in purely physical form. Just as a key adjusts the physical environment of the lock's internal mechanism to cause it to open, the stored executable program adjusts the physical environment inside the computer to activate switches, called transistors, in a precise sequence to cause the machine to function as a word processor or a PAC-MAN™ video game. The stored program can be symbolically represented in a form bearing a one-to-one correspondence with human-understandable symbols, the binary number system. However, the machine can no more understand the symbolic representation, the written symbols one and zero of the binary system, than it can understand the word "multiply." Nevertheless, it is precisely the one-to-one correspondence between the human symbolic representation and the physical environment inside a computer that makes computers so useful. Computer programmers are in fact circuit designers, although they design using sequentially implemented symbolic instructions. The machine converts these symbols, either directly from the symbolic ones and zeros if the program is written in object code or indirectly through a compiler if the program is written in a higher-level language, into appropriate physical signals that govern the machine's operation during execution of the program.

Consequently, programs are created using symbolic representations that are understandable only to trained human beings. They are certainly not understandable by machines, not even computers. This use of symbolic language to create programs leads naturally, almost inexorably, to their characterization \*44 as "literary works" under the Copyright Act.<sup>17</sup> However, programs resemble literary works only in their symbolic representation. Because programs are designed and used for computers to perform specific tasks, they differ fundamentally from literary works aimed at a human audience.<sup>18</sup> For this reason, argument by analogy to traditional literary works is unproductive at best.<sup>19</sup>

Notwithstanding the representational similarity of programs to literary works, programs remain the technology for using computers. They are not designed to communicate information, thought or feeling to human beings, nor are they designed to

communicate with, as opposed to physically control, computers. Even the process of program creation is more similar to the creation of other technological products than it is to the creation of books or plays, in that software engineers follow a logical and analytical process of defining the problem, specifying the design, implementing the design specifications (coding), documenting the procedures and specifications, and creating instructions for the user.<sup>20</sup> Notwithstanding its basic *purpose*, the source code program that results from this process can, of course, be read and understood, and to the extent that a program is designed with a view toward maintenance or improvement, it is even intended to be read at the time of creation. Moreover, other programmers may be interested in reading the program for the purposes of learning from and about it.<sup>21</sup> Thus, although the result of the programming process is expressed in a symbolic representation characteristic of literary works, the program is in a fact a technological and not a literary product.

Programs are no different from other technological products in another important area: technological efficiencies. Programs are designed to perform particular functions, and efficiencies such as a higher speed or more optimal use of available memory objectively distinguish one program as better than another. Even the court in *Whelan Assocs., Inc. v. Jaslow Dental Laboratory, Inc.*,<sup>22</sup> one of the most protectionist judicial decisions in this area to date, recognized that efficiency is a prime concern in programs, making such structural aspects as arrangement of modules and subroutines a critical factor for any programmer.<sup>23</sup> Many commentators, as well, have pointed out the importance of efficiency in programs.<sup>24</sup>

Closely connected with efficiency is another characteristic common to the development of software and other technologies; innovation occurs through sequential and cumulative improvements.<sup>25</sup> These improvements occur not simply through the efforts of an original creator, but by others who work in the same technological area and have access to the work. A civil engineer assigned to build a bridge at a particular place does not start from scratch but uses the accumulated knowledge of thousands of bridge builders who came before her, adapting to the particular circumstances she faces. In the course of building the particular bridge, she may also make some creative improvements in design or methodology. To the extent these improvements are not protected by patent law and are visible to other civil engineers who inspect her work, they will be incorporated into later bridges. While nonpatentable improvements \*45 are, by definition, “obvious” in a legal sense (and could theoretically be discovered independently by anyone skilled in the art), in practice engineers look to the work of others.

There is no reason to think that the software engineers are any different in the way they create their products.<sup>26</sup> The courts are increasingly recognizing, based on the evidence before them, that reference to existing programs in the creation of new ones is common in the industry.<sup>27</sup> In one case, for example, the witnesses for both sides admitted that dumping and analyzing competitors’ codes was standard industry practice.<sup>28</sup>

In the case of bridge construction technology, as well as all other forms of technological development prior to the advent of computer software, incremental improvements made by subsequent engineers are protected by law only if they involve nonobvious advances sufficient to make them patentable or, in the case of trade secrets, if the new technology cannot be discerned from inspection of the product. Absent patent protection, the monopoly in creative new technologies lasts only as long as it takes competitors to reverse-engineer the product and tool up for production. The advantages of even this limited amount of lead time seem to have been sufficient to provide an incentive for technological development.

Given these similarities to more traditional technologies, the question is whether computer software is different in any way that calls for a different type or level of protection from that traditionally afforded to nonpatented technology. The answer is clear and need not be belabored here. Because of the nature of programs, they can be duplicated without incurring any of the original creator’s development costs and indeed without even knowing anything about the code they contain. One can use the same tools (e.g., a computer) and the same raw materials (e.g., floppy disks) to duplicate programs of any kind, from video-games to word processing systems. Thus, the program pirate gets into competition almost immediately upon buying one copy of a commercially successful program, and he can sell it at a much lower price because of the absence of development costs. Moreover, the lead time available to the innovator of tangible products, which gives not only a short-term monopoly but also a chance to develop goodwill that may carry over to help sell his product even after competition develops, is reduced to almost nothing.

The ease of copying therefore provides the policy basis for distinguishing computer programs from more traditional technologies. There is virtually universal agreement that legal protection against literal copying of programs is justified. The debate, therefore, centers around how much protection should be afforded beyond prohibitions against literal copying. In addressing this question, we must remember that we are dealing with the protection of technology. We have decided to apply traditional copyright law directly to protect software, even though traditional copyright was designed to protect works of a very different, primarily non-technological character.

Expanded protection beyond traditional practice should be based on clearly articulated policy goals and be carefully tailored to meet those goals. To fail to do so runs the risk of upsetting the vague but steady balance between incentive and the free

flow of ideas that has characterized traditional copyright law, should expansive software protection come to be applied to more traditional works for which different policy goals are appropriate. Moreover, any decision to expand copyright protection for computer technology beyond that available for traditional technologies must consider whether the long period of copyright protection and the absence of compulsory licensing under copyright law remains \***46** appropriate under a more protective regime.

For many new technologies, difficulties such as these in the determination of the optimal protection regime are increasingly complex. This added to the increasing degree of piracy of such new technologies demonstrate the need for zealous advocacy of the American position in international negotiations for increased protection of these new technologies, given the importance of such technologies to the United States economy.

## **II. The American Economic Dilemma**

The assertion that the United States economy, or even the world economy, is headed for particularly difficult times can no longer be considered insightful.<sup>29</sup> The almost certain shift from United States worldwide economic dominance over the next decade has already angered the electorate, destabilized the political landscape and paralyzed responsible policymaking. National debt, consuming a lion's share of the limited funds available for capital investment, has severely impaired the rate of Gross Domestic Product growth. Japan's Parliament Speaker, Yoshio Sakuruchi, struck a sensitive nerve in the collective American psyche when he spoke of the difficulties in the American workforce as partially responsible for the decline in United States competitiveness<sup>30</sup> because his criticism was largely on target.<sup>31</sup>

As competitiveness in specific domestic production sectors declines, these sectors are lost to the downward spiral of market share deterioration, financial losses, and layoffs. This predicament unfortunately has become the plight of numerous major industries vital to our prosperity. Among those most significantly in danger is the manufactured goods industry.

The decline in exports of manufactured goods can be viewed from the revealing perspective of production characteristics. From 1960 to 1970, net exports in overall manufactures declined almost \$1 billion, while net exports in those manufactures which had a substantial research and development component increased over \$5 billion.<sup>32</sup> These statistics, although dated, demonstrate substantially that American research and development enhances competitiveness in goods manufactured for export. To the extent that we have been positioned in the global marketplace as leaders in new, advanced products, we have consistently achieved success.<sup>33</sup>

### ***A. Intellectual Property: Economic and Public Policy Rationales***

In order to *survive* the difficult economic hardships ahead, we must focus on our strengths--the ability of the United States to create value by scientific and technological advancement.<sup>34</sup> Global \***47** markets in information systems, biotechnology, energy and semiconductors are presently vast and full of future promise as new markets develop and gain purchasing power. For example, the pervasive changes taking place in the new Soviet Commonwealth have already resulted in new and increasingly open markets for previously developed U.S. technology.<sup>35</sup> Even though the cost of producing some technologies may have been retired long ago through domestic sales, the export of still-protected technologies represents further return on American investment and financial fuel for further research and development among a broad and deep array of other crucial domestic appropriations.<sup>36</sup>

Demonstration of the economic validity of an effort to improve protection for intellectual property is relatively simple from the perspective of the United States. Debate, for instance, over the rationality of economic resolutions often centers around the notion of Pareto-superiority.<sup>37</sup> Perhaps the best argument for protection of United States interests in computer software, biotechnology, and semiconductors is that uniform protection encourages creativity while fostering economic incentives. In the sections that follow, the argument focuses on the importance of intellectual property protection for both United States computer software and biotechnology producers. Since protection for these industries under intellectual property statutes may be supported as Pareto-superior, the option is demonstrably desirable. First, Americans are largely united with interests in a profitable business climate and the production of skilled persons. Consequently, the enhancement of global market incentives for these persons benefits the vast majority of Americans. Second, since the laws are enforced against foreign infringers, harm to Americans would be immaterial. The Pareto-superior character of such a policy initiative may thus be supported, although inevitably some meritorious criticisms of this simplistic analysis exist.<sup>38</sup> Furthermore, Pareto-superior options do not exhaust legitimate policy resolutions since public policy considerations are relevant as well.

Even if infringement of intellectual property were economically beneficial, those engaged in such activity do not contribute to the progress of the nation. Foreign infringers increase economic activity to an extent, producing the transfer of wealth and

distribution of technology (both limited primarily to the foreign nations themselves). Although these are important functions, a sound argument can hardly be made that infringement represents an appropriate means. The free market system has been shown to be a valid means of wealth transfer and resource allocation, while infringement escapes the market by weakening the producer's right to exclude others from the benefit of the product.

Furthermore, the framers of the Constitution in formally delineating the policy echoed the prior judgment of the English that encouragement of creative productivity was the dominant concern.

### ***B. Practical Conclusions***

To the extent that national economic objectives run contrary to those of the world, the resolutions deemed rational for each must be balanced. However, *from the national perspective*, United States interests may always be viewed as more important than global interests in determining *national* \*48 initiatives-- through responsible<sup>39</sup> deliberation and negotiation in the global forum, world interests will largely take care of themselves. Therefore, a persistent effort in advocacy of United States intellectual property rights enforcement is appropriate.

In balancing the various opposing interests inevitably arising from attempts to increase foreign protection for intellectual property, recognition of the obvious priority associated with certain nations is essential. Statistics might be analyzed to determine which nations are the most important as targets for insistent bilateral negotiations. Factors which might be assessed in the priority determination include the current extent of infringement in each nation, the current and forecasted size of each national market for the protected property, the ability of each nation to pay for the property, and the desirability of a relaxed policy toward protection of domestic IP rights as a means of economic developmental subsidy. To an extent, these ideas have been implemented as part of the "Special 301" provision of the Trade Act, to be discussed below.<sup>40</sup>

## **III. Motivating Change in the American Sphere of Influence**

Having established the validity of a priority initiative to enhance the protection offered abroad to United States intellectual property interests, this inquiry shall now turn to the assortment of possible modes for effecting the change. Much is already being done to battle the problem through negotiation and covenants.<sup>41</sup> Since, generally, infringing nations resist United States influence to arrest the drain, some means of leverage must be used to encourage respect for United States interests in this area. One sword essential in the battle is our control of the United States domestic market--the largest in the world. Almost all nations depend heavily on trade with the United States as a means of economic growth and development; moreover, infringement is a trade issue, and should be dealt with as such.<sup>42</sup> Through uniting the issues of fair intellectual property protection and import barriers, the United States gains key negotiating power.

### ***A. Multilateral Trade Negotiation***

1. *The General Agreement on Tariffs and Trade*<sup>43</sup>--The United Nations supervises the ongoing negotiations in the General Agreement on Tariffs and Trade (GATT) first formed in 1948 under the Havana Charter. The GATT's objective is to provide a reliable set of rules for international trade, and to serve as a forum for ongoing negotiations. Concerned primarily with international trade of goods, the GATT implements its provisions via trade preference to the contracting parties, the coveted most favored nation status. Several subordinate provisions of the agreement relating to fair taxation, tariff, and subsidy \*49 practices constitute the norms for fair trade among the contracting parties. In order to give force to its provisions, the GATT conducts the resolution of disputes arising under its terms.<sup>44</sup>

Policymakers have been aware of difficulties in foreign intellectual property protection for some time and have begun to address the difficulty. The United States has formally delineated its priorities for trade negotiation in the current round of GATT;<sup>45</sup> among them is to extend the GATT to provide for the protection of intellectual property. Indeed, the *Uruguay Round* of trade negotiations has not been the first to involve intellectual property discussion--counterfeiting of trademarks was an issue unresolved from the prior Tokyo Round in the 1970s. At the forefront of the current debate in the Uruguay Round are trade-related intellectual property rights ('TRIPs'). The United States has driven TRIPs to the table of negotiation<sup>46</sup> and succeeded in making it one of the negotiating groups (smaller, working negotiation groups created to facilitate progress on vexatious subjects). Inevitably, the progress in TRIPs has been slow; differences among the trading partners quickly surfaced and the subject's complexity presented a further obstacle for trade experts. At the midterm review of the Uruguay Round negotiations in 1988, the trouble in TRIPs was apparent. Since then, difficulties arising from unrelated agricultural issues stalled the talks.<sup>47</sup>

The most important problem, of course, in the TRIPs group is the developing countries' reluctance to assent to greater protection for the more developed nations' intellectual property rights. However, important differences exist as well among the developed nations.<sup>48</sup> The developing nations feel that knowledge should be treated as public property, and made freely available.<sup>49</sup> This perspective arises from the disparity between the developing and developed nations as net importers and exporters of intellectual property. The developing nations hope that since technology much-needed by their nations is not protected explicitly by the GATT, they might continue to infringe the producer's rights while the producer nations tacitly approve as a form of subsidy. They argue that stricter rules under TRIPs would likely reduce their revenues and limit access to the technology.<sup>50</sup> As demonstrated, the developed nations reasonably feel that inadequate protection of their intellectual property harms their ability to compete internationally. The development of the TRIPs discussion has been of great concern to the developing nations since the leading nations have greater influence in the negotiations and favor stricter rules, sacrificing the social and development needs of the low-income economies. However, since the low-income economies represent only limited increases in foreign sales of intellectual property, perhaps their concerns are premature. Furthermore, an international agreement under GATT holds more promise for a regime with which the lesser developed countries can live than that of bilateral pressure which the U.S. can bring to bear on infringing nations.

\***50** The GATT is the most promising avenue for obtaining an optimal intellectual property protection regime for a number of reasons. First, the GATT is a United Nations affiliate, joined by over 90 nations representing over 80% of world trade. A concentrated, successful effort in the Uruguay Round and the subsequent round as will apparently be necessary will unite nearly all major trading nations in a clearly defined trading environment. Second, with United Nations involvement, enforcement of the GATT/TRIPs provisions is more certain; therefore the provisions themselves will likely be respected. Third, the GATT is fundamentally related to most other international business transactions; the trend of increasing globalization calls for a unified, reliable, predictable, simplified, and therefore inexpensive international trade policy. Such a policy strengthens the global economy and the United Nations--an organization infinitely more necessary now than during its original inception.

2. *World Intellectual Property Organization*<sup>51</sup>.--The World Intellectual Property Organization (WIPO), in cooperation with GATT, encourages and administers international treaties in respect of intellectual property rights, disseminates information, and assists developing countries in technical areas.<sup>52</sup> The primary treaties which WIPO administers are the Berne Convention,<sup>53</sup> the Paris Convention,<sup>54</sup> and a multiplicity of other multilateral and bilateral international covenants on the protection of intellectual property.<sup>55</sup> The WIPO has as well proposed a treaty to protect semiconductor mask works, the Treaty on Intellectual Property in Respect of Integrated Circuits,<sup>56</sup> but the United States and Japan were so dissatisfied with the provisions of the treaty they refused to sign.<sup>57</sup>

Due to the WIPO's specialization, it seems not up to the task of arranging the agreements necessary to protect United States interests. The most important problem appears to be the lack of integration of trade issues along with the intellectual property issue. Since such strong differences exist between the developing nations' interests and those of the United States, the American position cannot be competently advocated in the WIPO forum. Loss of the spectre of unilateral trade sanctions weakens our position excessively.

## ***B. Bilateral Negotiation***

On the other hand, through bilateral negotiation the United States can focus trade pressure very effectively. Since so many of the nations involved in piracy are also very dependent on United States trade, direct negotiations allow the United States to compel these nations to treat our intellectual property owners fairly. However, due to the almost unfair bargaining position which the United States holds in such a situation, the nations which have been forced to comply with American intellectual property policy have brought their concerns into the GATT/TRIPs group. In return for their complicity with the less stringent proposed GATT provisions, they demand rescission of United States trade sanctions and covenants not to reinstate such sanctions.<sup>58</sup>

\***51** Through extensive studies using the procedures directed by the *Special 301* provision<sup>59</sup> of the 1988 Trade Act,<sup>60</sup> the United States Trade Representative has identified through extensive studies the nations of highest priority for intellectual property violations. Among those on the watch list are developing nations with brazen infringement practices and others which should represent much greater revenue than is currently realized. Surprisingly, some fully developed nations are among the worst offenders. Nevertheless, Carla Hills, current United States Trade Representative, has been widely criticized for her stalwart advocacy of the United States trade position.<sup>61</sup> The passage of Special 301 was made as a strategy to encourage amenable negotiation in the multilateral TRIPs negotiations through a "credible but distant threat of possible U.S. unilateral action."<sup>62</sup> The strategy worked. Many nations have responded to the provision and are likely to call for its repeal upon conclusion of the Uruguay Round.<sup>63</sup>

### **C. Domestic Policy Initiatives**

Modes of international effectuation of the goal of enhancing American competitiveness may be made considerably more successful via concomitant domestic policy initiatives. The time has come for plans centered on preparing this nation for a transformed economy. Unfortunately, almost any major initiative will require leadership that this nation's fragmented political machine may not be able to offer. Nevertheless, priorities recognized are a giant leap in the right direction.

One important policy which might be undertaken is a competent effort to address the difficulties faced by technology-producing industries. A favorable regulatory environment would offer certain vital producers immeasurable assistance in maintaining profitability in their risky ventures. This is not to say that safety or environmental concerns should be disregarded, rather that they be competently managed. Among improvements which might be made are access to the current applicable regulations in a well-developed, highly indexed online information system. Such a system would be very inexpensive given the level of today's information processing technology, and would assist the industries in navigation of the voluminous rules, thereby decreasing costly violations. Deregulation in a very foresighted, careful manner might be appropriate in many areas and more efficient administration of the required approvals and licenses would certainly be key to the survival of many risky ventures. Failure to do such things can be costly. For example, biotech industries enduring these problems have responded in alarming ways. Some have simply relocated to areas where they feel regulations and public response are more conducive to their leading-edge experimentation.<sup>64</sup> Thus work in this area may draw businesses away from other nations that fail to do so.

The International Trade Commission might attempt to become more of a business service agency, assisting United States companies in obtaining patent and copyright protection in many foreign nations to which the United States commonly exports.

Lastly, the federal government simply must reform the education system to provide a work force capable of competing in the markets for production of technology. America will need many more skilled \*52 workers in the workplace of the future and many more very highly skilled designers, engineers, artists, and other workers with advanced degrees. With a current system riddled with dropouts, illiteracy, and crime, skilled man-hours will simply not be available when they are needed.

Notwithstanding the political expense, this grim reality must be communicated to the people--especially to the *children* through their parents--more effectively in order to transform and unify public recognition of the necessity for change.

### **IV. Conclusions**

The export of intellectual property is perhaps one of the most important economic factors in the future of the United States. There is ample cause for concern for the nation; declines in the volume of exports are among a variety of alarming trends. Yet certain industries remain strong--those with strong emphasis on the ingenuity of the American in production of new technology. Unfortunately, the intangible nature of this newly-important product causes difficulties for which our laws and those of the international trade community are not yet equipped. For instance, computer software fits only contrivedly into existing property protection schemes. Moreover, the ease with which such intangibles can be pilfered further frustrates the problem. Foreign infringement of U.S. intellectual property is excessive and continues as the U.S. works to stem the tide. The most effective modes of protection of U.S. interests in intellectual property are multilateral and bilateral trade negotiation and certain domestic initiatives. These activities are crucial to the nation's economic future, and must be considered of the utmost priority.

#### **Footnotes**

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<sup>2</sup> *United States Merchandise Trade 1953-1970*, GATT Studies in International Trade, no. 3, p. 24 (July 1972).

<sup>3</sup> *Trade Policy Review*, GATT Studies in International Trade, p. 124 (1990).

<sup>3</sup> Frank Emmert, *Intellectual Property in the Uruguay Round-- Negotiating Strategies of the Western Industrialized*

*Countries*, 11 MICH. J. INT'L L. 1317, 1325 (1990).

<sup>4</sup> The origin of intellectual property law lies with the medieval English guilds--groups of artisans who, through cooperation and later by royal decree, had cornered the market on their respective crafts. This early form of monopoly was first formally codified in 1623 with the Statute of Monopolies, a law designed to limit the unrestricted royal grants of monopoly which had begun to inhibit free trade and competition. The Statute of Anne, enacted in 1710, was the earliest codification of protection for authors of original works and is the predecessor to the modern law of copyright.

<sup>5</sup> See, e.g., *Carter-Wallace, Inc. v. Riverton Laboratories, Inc.*, 304 F. Supp. 357, 367 (S.D.N.Y. 1969) (stating that the purpose of a patent is not to reward inventors but to give incentive to publicly disclose new and useful inventions), *aff'd*, 433 F.2d 1034 (2d Cir. 1970); *Lage v. Caldwell Mfg.*, 221 F. Supp. 802, 805 (D.Neb. 1963) (stating that reward to an inventor is less important than the promotion of science and the arts).

<sup>6</sup> Patents may be issued by the Patent & Trademark Office [hereinafter, PTO] based on the examiner's consideration of three factors: federal patent law as delineated in the Constitution, the Patent Act, and relevant judicial decisions. The first patent statute was enacted by Congress in 1790; it has been substantially revised four times: Act of Feb. 21, 1793, ch. 11, 1 Stat. 318; Act of July 4, 1836, ch. 356, 5 Stat. 117; Act of July 8, 1870, ch. 230, 16 Stat. 198; Act of July 19, 1952, ch. 950, 66 Stat. 792 (codified as amended at 35 U.S.C. §§ 1-293 (1988)).

<sup>7</sup> *Universal Oil Prods. Co. v. Globe Oil & Ref. Co.*, 322 U.S. 471, 484 (1944) (stating that the seventeen year monopoly encourages disclosure and is a reward for inventions).

<sup>8</sup> Such benefits may include jobs and increased economic security for U.S. citizens. *Cf. Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974) (stating that patent law offers a right of exclusion to inventors as an incentive for their undertaking the risks/costs associated with research and development); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 266 (1977) (analogizing what Kitch terms the "prospect" function of the American patent system with the mineral claim system of the American west. Essentially, Kitch points out that the function of a "prospect" (which he defines as an opportunity to develop a particular technological possibility) is to assume efficient allocation of resources among firms, award their risk-taking within the field, and promote efficient communication among firms/researchers so as to prevent duplicative research as well as economic waste).

<sup>9</sup> *Hutchinson Tel. Co. v. Frontier Directory Co.*, 770 F.2d 128, 130 (8th Cir. 1985). *See also, Harry Fox Agency, Inc. v. Mills Music, Inc.* 543 F. Supp. 844, 862 (S.D.N.Y. 1982) (stating that the purpose of copyright laws is to encourage production and spread of artistic works for the general public good), *rev'd on other grounds*, 720 F.2d 733 (2d Cir. 1983), *rev'd sub nom.*, *Mills Music, Inc. v. Snyder*, 469 U.S. 153 (1985).

<sup>10</sup> U.S. CONST. art. I, § 8, cl. 8. Based on this clause, Congress enacted the present utility patent statute in 1952. *Cf. Act of July 19, 1952, ch. 950, 66 Stat. 792 (codified as amended at 35 U.S.C. §§ 100-376) (1988).*

<sup>11</sup> U.S. CONST. art. I, § 8, cl. 3.

<sup>12</sup> 15 U.S.C. § 1051 (1988) (originally codified at ch. 540, 60 Stat. 427 (1946)).

<sup>13</sup> 35 U.S.C. §§ 100-376 (1988).

<sup>14</sup> 17 U.S.C. §§ 10-914 (1976).

<sup>15</sup> Note *Copyright Protection of Computer Program Object Code*, 96 HARV. L. REV. 1723, 1725 (1983) (explaining that the source code of a program involves written text in readable form while machine or object code involves electrical signals corresponding to the associated source code). There exists case law holding object code as literary works under the Copyright Act. *See Apple Computer v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984) (expanding the Copyright Act such that source or object code is protected under copyright).

<sup>16</sup> The literature concerning the legal protection of computer software is already voluminous. Much of the commentary and even the judicial decisions include introductory discussion outlining and explaining the technology, usually with both accuracy and completeness. To avoid repeating much of this now well-known material, including the detailed factual situations involved in the cases, this note assumes a general knowledge of both the cases and the commentary. For general discussion of the technology in the legal literature, see generally Peter B. Maggs & James A. Sprowl, COMPUTER APPLICATIONS IN THE LAW 68 (1987); Duncan M. Davidson, *Protecting Computer Software: A Comprehensive Analysis*, 23 JURIMETRICS JOURNAL, 337,340-48 (1983); Paula Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 4 DUKE L.J. 663, 672-90 (1984).

<sup>17</sup> “‘Literary works’ are works . . . expressed in words, numbers, or other verbal or numerical symbols or indicia . . . .” 17 U.S.C. § 101 (1988). Computer programs are universally regarded as falling within this category. *E.g.*, *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1249 (1983), *cert. dismissed*, 464 U.S. 1033 (1984); NATIONAL COMM’N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT OF THE NATIONAL COMM’N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS (1978).

<sup>18</sup> Grogan & Kump, *The Broader Meanings of Apple v. Franklin in the Development of Compatible Operating Systems and in Determining Standards for Injunctive Relief*, COMPUTER LAW 1, no. 1 (Jan. 1984): 15, 18.

<sup>19</sup> Raymond Nimmer & Patricia A. Krauthaus, *Copyright and Software Technology Infringement: Defining Third Party Development Rights*, 62 IND. L.J. 13, 21 (1986).

<sup>20</sup> Plains Cotton Coop. Ass’n v. Goodpasture Computer Serv., Inc., 807 F.2d 1256, 1258 (5th Cir. 1987).

<sup>21</sup> Depending on their resolution of the basic policy issues in the software protection debate, some may refer to reading for this purpose as “stealing” rather than “learning.” At this stage of the analysis, the term “learning” can be interpreted broadly to include any taking from the original program that involves human thought in the taking process.

<sup>22</sup> 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

<sup>23</sup> *Id.* at 1230. The court also noted that efficiencies and conveniences are involved in data organization, after the program structure has been determined, which makes the program more or less desirable, *id.*

<sup>24</sup> David B. Drysdale *Thoughts on Copyright: Computer Programs*, 3 COMP. L. & PRACTICE 91, 92 (1987); Grogan & Kump, *supra* note 9, at ?.

<sup>25</sup> Note, *Copyright Infringement of Computer Programs: A Modification of Substantial Similarity Test*, 68 MINN. L. REV. 1291 (1984). *See also* Nimmer & Krauthaus, *supra* note 19, at 61; John M. Conley & Robert M. Bryan, *A Unifying Theory for the Litigation of Computer Software Copyright Cases*, 6 COMP. L.J. 55, 60-61 (1985).

<sup>26</sup> Even the *Whelan* court seemed to recognize this point, although missing its implications: “We are not convinced that progress in computer technology or technique is qualitatively different from progress in other areas of science or the arts.” *Whelan Assocs., Inc. v. Jaslow Dental Lab.*, 797 F.2d 1222, 1238 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031

(1987).

<sup>27</sup> Q-Co Industries v. Hoffman, 625 F. Supp. 608, 612 (S.D.N.Y. 1985) (revealing that defendant programmer collected books and programs he thought would be of assistance in developing the program he wished to write); E. F. Johnson Co. v. Uniden Corp. of America, 623 F. Supp. 1485, 1498 n.11 (D. Minn. 1985) (claiming that the computer software industry progresses by a stepping-stone improvement process, with each innovation building on past innovations to produce an improved product); Synercom Technology, Inc. v. University Computing Co., 462 F. Supp. 1003, 1007 (N.D. Tex. 1978) (revealing that program improvement resulted from combining many functions already available from other programs into a single package).

<sup>28</sup> E.F. Johnson Co., 623 F.Supp. at 1501 n.17.

<sup>29</sup> R. Taggart Murphy, *Power Without Purpose: The Crisis of Japan's Global Financial Dominance*, HARV. BUS. REV., Mar.-Apr. 1989, at 71 (detailing a dreadful perspective on the negative impact of Japan's sharp increase in global financial influence). See also Edward J. Lincoln, *A New Kind of World Power-- Japan in the 1990s*, THE BROOKINGS REV., Spring 1992, at 12 (casting Japan as the model nation state for the U.S. to *encourage and emulate*, and implying that among other problems, the U.S. excessive allocation of resources to military power has unduly compromised our global status).

<sup>30</sup> David E. Sanger, *A Top Japanese Politician Calls U.S. Work Force Lazy*, N.Y. TIMES, Jan. 21, 1992, at D1 (wherein Japanese Parliament Speaker Yoshio Sakurai is quoted as stating before an assembly that a source of the U.S. decline in competitiveness "is the inferior quality of U.S. labor . . . U.S. workers are too lazy. They want high pay without working." He further asserted that about 30 percent "cannot even read.").

<sup>31</sup> Unfortunately, the Speaker's comments aren't entirely false; some difficulty exists with declining work ethics, excessive salaries, and illiteracy. See David E. Sanger, *America Bashing, Not All False*, N.Y. TIMES, Jan. 22, 1992, at A22.

<sup>32</sup> United States Merchandise Trade 1953-1970, *supra* note 1, at 24.

<sup>33</sup> See Jacob M. Schlesinger, *Not So Invincible: Electronics Industry in Japan Hits Limits After Spectacular Rise: Some Markets Get Saturated and Many Firms Lag in Creating New Products*, WALL ST. J., Apr. 28, 1992, at A1 (describing problems of the Japanese manufacturers as arising partially due to their lack of emphasis on development of new technology).

<sup>34</sup> See G. Pascal Zachary, *Apple Unveils 'Breakthrough' In Technology: Macintosh Model Responds To Spoken Commands Using Plain Language*, WALL ST. J., Feb. 24, 1992, at A1 (relating an announcement by John Sculley, CEO of Apple, at the company's speech-recognition technology breakthrough--clearly a vastly profitable, globally marketable technology).

<sup>35</sup> See John J. Keller, *AT&T Sets Accord To Adapt, Sell Gear in Russia*, WALL ST. J., Feb. 13, 1992, at B3 (describing a recent joint venture between AT&T and a Russian telephone equipment manufacturer and indicating that AT&T intends to draw profits from the operation back to its U.S. parent, wherein an AT&T spokesman is quoted as saying, "The business potential, given the country's size, is enormous.").

<sup>36</sup> Keith Bradsher, *American Exports to Poor Countries are Rapidly Rising*, N.Y. TIMES, May 10, 1992, at A1.

<sup>37</sup> One state of the world, S1, is Pareto-superior to another, S, if and only if no one is worse off in S1 than in S, and at least one person is better off in S1 than in S. The Pareto superiority criterion is limited, however, in a very basic way. It enables us to order or rank social states, and thus to evaluate policies only when there are no losers. Policies can

prevent losers in one of two ways: straightforward (as this paper attempts to) or by compensation ex post.

<sup>38</sup> For example, American investors in foreign infringers or foreign intellectual property consumers (as the price for intellectual property rose) would be harmed. The response to this may require a more detailed analysis, including a comparison of the extent to which these persons would be harmed with the extent to which these persons would benefit from the resolution. This analysis would fall outside the bounds of Pareto-optimality theory, and as well outside the scope of this inquiry.

<sup>39</sup> Care must be taken to monitor the progress of international trade and intellectual property policy for developments which run contrary to global interests. Of course, macroeconomic theory conventionally applied to national economies applies as well to the global economy; defects in the free-market system caused by externalities are manifest. Cf. Paul Lewis, *U.S. Informally Offers to Cut Rise in Climate-Warming Gases*, N.Y. TIMES, April 29, 1992, at A10 (explaining that the U.S. only is reluctantly willing to make treaty concessions crucial to the environmental future of Earth). Yet unfortunately, the world has no supreme government to respond to such difficulties as do nations. Therefore, responsible leading nations must rise to the occasion when necessary, perhaps contrary to their interests, to address thorny externalities such as environmental decay. For a rigorous pedagogical illustration of the economic theory underlying this discussion, see RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW*, (3d ed. 1985); William M. Landes & Richard A. Posner, *Trademark Law: An Economic Perspective*, 30 J.L. & ECON. 265 (1987).

<sup>40</sup> See *infra* note 47.

<sup>41</sup> Of course, negotiation and treaties have long addressed the problem of protection of intellectual property, necessitated by distribution of literary works long before the modern sales of valuable technology.

<sup>42</sup> Among alternative means of inducing modification of foreign nations' policies, military pressure comes to mind. However, no controversy is likely over the obvious irrationality of the use of military force for such reasons, except if the technology sought by such foreign nations were of an absolutely vital national security interest. Observe generally from this perspective the nuclear proliferation factor in the 1991 Persian Gulf conflict.

<sup>43</sup> General Agreement on Tariffs and Trade, *opened for signature* Oct. 30, 1947, 61 Stat. A5, 55 U.N.T.S. 187.

<sup>44</sup> Marshall A. Leaffer, *Protecting United States Intellectual Property Abroad: Toward a New Multilateralism*, 76 IOWA L. REV. 273, 299 (1991).

<sup>45</sup> The codified position of the United States has been:

“(a) Overall trade negotiating objectives. The overall trade negotiating objectives of the United States are to obtain--  
(1) more open, equitable, and reciprocal market access;  
(2) the reduction or elimination of barriers and other trade-distorting policies and practices; and  
(3) a more effective system of international trading disciplines and procedures. . .  
(b)(10) Intellectual property. The principal negotiating objectives of the United States regarding intellectual property are--  
(A) to seek the enactment and effective enforcement by foreign countries of laws which--  
(i) recognize and adequately protect intellectual property, including copyrights, patents, trademarks, semiconductor chip layout designs, and trade secrets . . .”  
19 U.S.C. § 2901 (1988).

<sup>46</sup> See generally GENERAL ACCOUNTING OFFICE, *INTERNATIONAL TRADE: STRENGTHENING WORLD PROTECTION OF INTELLECTUAL PROPERTY RIGHTS*, (1987); A. Jane Bradley, *Intellectual Property Rights, Investment, and Trade in Services in the Uruguay Round: Laying the Foundations*, 23 STAN. J. INT'L L. 57 (1987) (providing a thorough review of United States treatment of TRIPs in the multilateral negotiations).

<sup>47</sup> Judith H. Bello and Alan F. Holmer, *Special 301*, 14 FORDHAM INT'L L.J. 874, 877-78 (1991).

<sup>48</sup> Even Canada and Japan have been identified by the U.S. Trade Representative as important infringers of American intellectual property. OFFICE OF THE U.S. TRADE REPRESENTATIVE, FACT SHEET: "SPECIAL 301" ON INTELLECTUAL PROPERTY (May 25, 1989), *reprinted in* 6 Int'l Trade Rep. (BNA) No. 22, 718 (May 31, 1989), *cited in* Bello, & Holmer, *supra* note 47, at 875.

<sup>49</sup> Emmert, *supra* note 41, at 1318.

<sup>50</sup> M.M. Kostecki, *Sharing Intellectual Property Between the Rich and the Poor*, 13 EUR. INTELL. PROP. REV. NO. 8, at 271 (1991).

<sup>51</sup> Created by the WIPO Convention, July 14, 1967, and associated as a special agency of the United Nations by resolution in 1974. *See generally* WORLD INTELLECTUAL PROPERTY ORGANIZATION, SPECIAL AGENCY, UNITED NATIONS, WIPO: WHAT IT IS, WHAT IT DOES, Pub. 436(E), (1987) (providing a general description and brief history of WIPO).

<sup>52</sup> Leaffer, *supra* note 44, at 292.

<sup>53</sup> *E.g.*, Berne Convention, Protection of Literary and Artistic Works, Sept 9, 1986, *reprinted in* WORLD INTELLECTUAL PROPERTY ORGANIZATION, GUIDE TO THE BERNE CONVENTION, (1987).

<sup>54</sup> Paris Convention, Protection of Industrial Property, *reprinted in* INTERNATIONAL TREATIES ON INTELLECTUAL PROPERTY (M. Leaffer, ed., 1990).

<sup>55</sup> Emmert, *supra* note 3, at 1338. For a text of the major treaties on Intellectual Property with commentary, see Leaffer, ed., *supra* note 54.

<sup>56</sup> As yet, the third world nations most interested have been able to block the treaty by negotiating tough provisions unacceptable to the West. The draft treaty was signed, however, by six third world nations at a conference in Washington, D.C. on May 26, 1989. *See* Leaffer, *supra* note 44, at 293.

<sup>57</sup> U.S., *Japan Refuse to Sign WIPO Treaty to Protect Integrated Circuits*, 6 International Trade Rep. (BNA) at 742 (May 31, 1989).

<sup>58</sup> Kostecki, *supra* note 50, at 273.

<sup>59</sup> 19 U.S.C. § 2242 (1992).

<sup>60</sup> Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, 102 Stat. 1107 (1988) (codified in scattered sections of 19 U.S.C.).

<sup>61</sup> Emmert, *supra* note 41, at 1317.

<sup>62</sup> Bello & Holmer, *supra* note 47, at 876.

<sup>63</sup> *Id.*, at 879.

<sup>64</sup> Ronald Bailey, *Brain Drain*, Forbes, Nov. 27, 1989, at 261 (“[T]ake the story of German chemical giant BASF Group, (1988 sales \$24 billion). For over a year its Knoll pharmaceutical subsidiary has been prevented from manufacturing the cancer fighting substance tumor necrosis factor in Ludwigshafen . . . Just this September BASF announced that it is building a \$60 million biomedical R&D facility in Massachusetts.” In addition, Hoechst invested over \$60 million for research at Massachusetts General Hospital. Henkel, 1988 sales \$5.6 billion, relocated its primary research facility from Dusseldorf to Santa Rosa, Cal.). *See also* H. Jeffrey Leonard, *Are Environmental Regulations Driving U.S. Industry Overseas?*, 2 PACE ENVTL. L. REV. 166 (1984) (noting that United States companies did not relocate overseas in response to heightened environmental regulation).