Chapter 8

Impact of New Technologies on the International Intellectual Property System

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FINDINGS

OTA found that recent developments in information and communication technologies are creating new stresses on the international intellectual property system. Such developments include:

- the increasing flow of information and information-based products and services among nations;
- the growing economic importance of information and related products and services, both within and between nations;
- the increasing cultural and political significance of information and related products and services;
- the emergence of new information-based products and services that do not correspond to traditional categories of protection;
- the increasing difficulty of enforcing intellectual property rights at the international level; and
- the growing convergence of international intellectual property issues with other international issues.

Given their magnitude, these technological developments pose novel difficulties that challenge the relative stability of the international system. They affect not only the international legal system, but also international economic and political relations. Consequently, they have major implications for the United States both as a participant in the international intellectual property system and also with respect to its choices for domestic intellectual property policy. These policy implications are:

- As information and communication technologies facilitate the international exchange of intellectual property, domestic intellectual property issues will need to be resolved within an international context and according to internationally agreed upon norms.
- As technological change prompts greater need for rapid international consensus on how and what to protect, the United States will need to take greater international action to keep abreast of as well as influence the development of international policies for the protection of new technologies.
- As information and information-based products and services become major trade items and the basis for economic growth, international trade and economic considerations will increasingly be brought to bear on the resolution of international intellectual property issues.
- Given the growing cultural and political significance of information-based products and services, international political relations will need to be taken into account in resolving international intellectual property issues.
- As information and communication technologies undermine the traditional mechanisms for enforcing intellectual property rights, the international community will need to cooperate and coordinate their efforts to provide adequate and uniform enforcement mechanisms and remedies.
- Given the convergence of international intellectual property issues with other international issues, the United States might need to establish domestic institutional arrangements to develop and coordinate consistent international policies.

The United States can choose among a variety of policy strategies to deal with technological change and its effects on the international intellectual property system. There is no clear-cut, single strategy, however, that will comprehensively address all international intellectual property issues. Moreover, many policy strategies may conflict with one another and exacerbate other stresses on the international intellectual property system. Thus, the United States will need to make fundamental decisions about how it would like to frame international intellectual property issues (for example, in terms of trade, legal, or political relations) and design its international intellectual property policies accordingly. As information and communication technologies become major factors in international trade and nations' economic and social development, such policy decisions will become more significant to many aspects of U.S. foreign policy—from international issues of trade, defense, and foreign aid to issues of international information and communication policy.

INTRODUCTION

Historically, U.S. intellectual property policy developed in isolation from the rest of the world. Such isolation was possible because print materials were confined, for the most part, within national borders. Over time and as the necessity arose, the United States slowly began to extend its participation in the international intellectual property system.

Recently, however, new technological developments have led to a great expansion in the number of ways to create, store, reproduce, distribute, and transmit literary, scientific, and creative works. The progressive development of, for example, radio, television, and computers coupled with advanced telecommunication and satellite systems have greatly increased international distribution and access to works. These technological developments are creating new stresses on the international intellectual property system, which raise questions about whether the United States should play a more active role in the international intellectual property system.

To examine the effects of new communication and information technologies on the international intellectual property system and the adequacy of U.S. participation in it, this chapter will:

1. review the early history of U.S. participation in the international intellectual property system;
2. describe the present international intellectual property system;
3. describe how technological developments may affect the international intellectual property system; and
4. suggest the implications that these developments have for both the level and type of U.S. participation in the international intellectual property system and for U.S. domestic intellectual property policy.

EARLY HISTORY

Before the 19th century, intellectual property protection was largely a domestic concern. Because of the limited intercourse and communication among nations, works were distributed almost exclusively within their authors' country. Thus, the lack of international protection caused little concern.

By the early 1800s, a variety of social and technological developments began to generate interest in international intellectual property protection. Increased trade, communications, and travel were important factors, as was the growing practice of learning foreign languages. In response, the European nations began to

consider mechanisms to ensure protection abroad for their domestic works, as well as to protect foreign works. These nations first set up a number of bilateral protection agreements; then, in 1866, many of the European nations joined together and signed the first multilateral agreement, the Berne Convention.[1]

While many European states relied on multilateral agreements to regulate their copyright relations, the United States did not participate in any international copyright arrangements for the first 100 years of its existence, nor did it recognize any copyright protection for foreign works or authors.[2] In fact, in the first U.S. copyright law of 1790, Congress explicitly restricted the protection of foreign works:

> . . . [N]othing in this act shall be construed to extend to prohibit the importation or vending, reprinting or publishing within the United States, of any map, chart, book or books, written or printed, or published by any person not a citizen of the United States, in foreign parts or places without the jurisdiction of the United States.[3]

It was not until 1891, when Congress passed the Chace International Copyright Act, that the United States begin to recognize international copyright relations. The act, however, provided neither for multilateral agreements nor for the protection for foreign works manufactured outside the United States.[4] But it did extend copyright relations to nations found and proclaimed by the President to afford adequate protection to American works. This act provided the basis for all of the U.S. bilateral copyright relations for more than the next 60 years.

[1]Edward W. Ploman and L. Clark Hamilton, *Copyright: Intellectual Property in the Information Age* (London: Routledge & Kegan Paul, 1980), p. 18.

[2]The position of the United States was almost unique at the time. The major Western nations early on made provisions for the international protection of authors' rights. Acting in 1828, Denmark was the first, Prussia followed in 1836 and England in 1837. France in 1852 and Belgium in 1854 also granted protection for all for foreign works. By the mid-19th century, only the Soviet Union, the Ottoman Empire, and the United States did not grant protection for foreign works. Aubert J. Clark, *The Movement for International Copyright in Nineteenth Century America*, (Washington DC: The Catholic University Press, 1960), p. 26.

[3]Committee on the Judiciary, Subcommittee on Patents, Copyrights, and Trademarks, hearing on "Oversight on International Copyrights, ' Sept. **24, 1984, p. 28.**

[4]The manufacturing requirement, still in existence today albeit in a much diluted form, stipulates that nondramatic literary material must be manufactured in the United States (or Canada) to enjoy full copyright protection in the United States. This requirement is scheduled to be repealed as of July 1986. Title 17 U.S.C. Sec. 601(a).

PRESENT INTERNATIONAL INTELLECTUAL PROPERTY SYSTEM

Over the last century, the international system for protecting intellectual property has been quite stable, displaying a higher level of cooperation than other international agreements. Unlike other international agreements that are periodically readapted or completely revised, the interlocking conventions that constitute the international intellectual property system have provided a permanent legal frame work, although it is subject to amendments and revisions if required. Table 8-1 summarizes the major international intellectual property conventions. Table 8-2 shows the national membership of each of the three major intellectual property agreements.

The system is complex and structured around many different international conventions and agreements to which different groups of countries adhere. These conventions share several outstanding characteristics that govern the international intellectual property system. They are:

1. the harmonization of disparate national intellectual property systems;
2. the principle of national treatment; and
3. the establishment of minimum rights.

Harmonization of Disparate National intellectual Property Systems

Although rooted in various philosophical traditions, the intellectual property systems of different nations have been harmonized over the years under international intellectual prop-

Table 8-1.—International Intellectual Property Agreements

Agreement	Revisions	Protected subject matter	U S membership	Comments
Copyright *agreements:*				
The Berne Convention for the Protection of Literary and Artistic Works (1886)	1896: Paris Additional Act and Interpretative Declaration 1908 Berlin Act 1914 Berne Additional Protocol 1928: Rome Act 1948: Brussels Act 1967 Stockholm Act 1971 Paris Act	"This Convention obliges Contracting States to protect the expression of literary and artistic works [which include] every production in the literary, scientific, and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets, and other writings: lectures, addresses, sermons and other works of the same nature, dramatic or dramatlco-musical works: choreographic works and entertainments in dumb show; musical compositions with or without words, cinematographic works to which are assimilated works expressed by a process analogous to cinematography: works of drawing, painting, architecture, sculpture, engrawng, and lithography, photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art, Illustrations, maps. plans, sketches, and three-dimensional works relative to geography, topography, architecture, or science. " Article II	No	Basic principles established under the Berne Convent Ion 1 Principle of national treatment 2. Principle of automatic protection (with no formalities) 3 Principle of Independence of protection 4 Minimum rights
The Rome Convention for the Protection of Performers, Producers of Phonograms, and Broadcasting Organizations (1961)	None	This Convention obliges Contracting States to extend protection: "a) to performers who are its nationals, as regards performances taking place, broadcast. or first fixed. on its territory, b) to producers of phonograms who are its nationals, as regards phonograms first fixed or first published on its territory, c) to broadcasting organizations which have their headquarters on its territory, as regaras Broadcasts transmitted from transmitters situated on its territory " Article II	No	
The Universal Copyright Convention (1957)	1971: Paris	"Each Contracting State undertakes to provide for the adequate and effective protection of the rights of authors and other copyright proprietors in literary, scientific, and artistic works, including writing, musical, dramatic, and cinematographic works, and paintings, engravings, and sculpture. " Article 1.	Yes	The primary purpose of the UCC was to join the United States and the Latin American countties with the countries of Europe, Asia, and Africa in a single multinational agreement. Like the Berne Convent Ion, the UCC IS based on national treatment and minimum rights. Unllie the Berne Convention, the UCC has several formalities, such as a notice requlirement
The Convention for the Protection of Producers of Phonograms Against the Unauthorized Duplicatlon of Their Phonograms (1971)	None	"Each Contracting State shall protect producers of phonograrns who are nationals of other Contracting States against the making of duplicates without the consent of the producer and against the Importation of such duplicates, provided that any such making or Importation IS for the purpose of distribution to the public, and against the distribution of such duplicates to the public. " Article II.	Yes	

Table 8-1 .—International Intellectual Property Agreements—Continued

Agreement Revisions	Protected subject matter	U.S. membership	Comments
Inter American Copyright Convent Ions			
The Montevideo Convention (1889)	This Convent Ion obliges Contracting States to protect the expres-	No	The Buenos Aires Convent Ion of 1910 remains the basic Pan
None	sion of literary and artistic works which include books, writings,		
The Mexico City Convent Ion (1 902)	pamphlets of al l Kinds, whatever may be the subject of which they	No	American copyright Instrument
None	treat and whatever the number of their pages, dramatic or dramatico-		During the past 20 years there has
The RIO de Janeiro Convent Ion (1 906)	musical works choreographic and musical compositions with or	No	been a clear trend away from these
None	w ithout words, drawings paintings sculpture engravings		regional copyright conventions IN
The Buenos Aires Convention (1910)	photographic works astronomical and geographical globes. plans	Yes	favor of worldwide agreements
None	sketches or plastic works relating to geography geology or		Consequently in many Instances
The Havana Convention (1928)	topography archiltecture or any other science and finally all	No	the UCC has replaced the Pan-
None	productions that can be published by any means of Impress Ion or		American conventions as the
The Washington Convention (1946)	reproduction Article II	No	operative agreement
None			
The Convent Ion Relating to Distribution of Program-Carrying Signals Transmitted by Satellite (1974)			
None	The Convent Ion obliges Contracting States to take adequate and effective measures to prevent the distribution on or from its territory of any program-carrying signal by any distributor for whom the signal emitted to or passing through the satellite IS not Intended."	Yes	
Patent and Trademark Agreements:			
The Paris Convent Ion for the Protect Ion of Industrial Property (1 883)			
1900: Brussels 1911 Washington 1925 The Hague 1934 London 1938 Lisbon 1967 Stockholm	The protection of industrial property has as Its object patents, utility models industrial designs, trademarks, service marks, trade names indications of source or appellations of origin. and the repression of unfair competition. Industrial property shall be understood in the broadest sense and shall apply not only to industrial and commerce proper but likewise to agricultural and extractive Industries and to all manufactured or natural products for example. wines, grain, tobacco leaf fruit cattle. minerals, mineral waters, beer, flowers, and flour Patents shall Include the various kinds of Industrial patents recognized by the laws of the countries of the Union such as patents of importation patents of [improvement, patents and certificates of addition etc." Article I	Yes	
The Patent Cooperation Treaty (1 978)			
None	The Treaty facilitates the filing of the applications for patents on the same Invent Ion in member countries by providing among other things for centralized filing procedures and a standardized application format	Yes	

SOURCE Off Ice of Technology Assessment

Table 8-2.— Membership in the Berne Convention, the Universal Copyright Convention, and the Paris Convention for the Protection of Industrial Property

Country	Berne	UCC	Paris	Country	Berne	UCC	Paris
Algeria		X	X	Korea, Republic of			X
Andorra		x		Laos		X	
Argentina	X	x	X	Lebanon	X	X	
Australia	x	X	X	Liberia		x	X
Austria	X	X	X	Libya	X		
Bahamas	X	X	X	Liechtenstein	X	X	X
Bangladesh		X		Luxembourg	X	X	x
Barbados	X	X		Madagascar	X		X
Belgium	X	X	X	Malawi		X	X
Belize		x		Mali	x		X
Benin	x		X	Malta	X	x	X
Brazil	X	X	X	Mauritania	X		X
Bulgaria	X	X	X	Mauritius		X	X
Burkina Faso	X			Mexico	X	X	X
Burundi			X	Monaco	X	X	X
Cameroon	X	X	X	Morocco	X	X	X
Canada	x	x	x	Netherlands	x	x	x
Central African Republic	x		X	New Zealand	X	X	X
Chad	x		X	Nicaragua		x	
Chile	X	x		Niger	x		X
Colombia		x		Nigeria		X	X
Congo	x		X	Norway	x	X	x
Costa Rica	X	X		Panama		X	
Cuba		X	X	Pakistan	X	X	
Cyprus	X		X	Paraguay		X	
Czechoslovakia	X	X	X	Peru		X	
Democratic Kampuchea		X		Philippines	X	X	X
Denmark	X	X	X	Poland	X	x	X
Dominican Republic		x	X	Portugal	X	X	X
Ecuador		X		Romania	x		X
Egypt	x		X	Rwanda	X		X
El Salvador		X		San Marine			X
Fiji	X	X		Senegal	x	x	x
Finland	X	x	X	Singapore			
France	x	x	X	South Africa	X		x
Gabon	X		X	Soviet Union		X	X
Germany, Democratic Republic of	X	X	X	Spain	X	x	x
				Sri Lanka	X	X	X
Germany, Federal Republic of	X	X	X	Suriname	X		X
				Sweden	X	X	X
Ghana		X	X	Switzerland	X	x	X
Greece	X	x	X	Syria			X
Guatemala		X		Tanzania			x
Guinea	x	x	X	Thailand	x		
Haiti		x	X	Togo	X		X
Holy See	X	X	X	Trinidad and Tobago			X
Hungary	x	x	X	Tunisia	X	X	X
Iceland		X	X	Turkey	X		X
India	X	X		Uganda			X
Indonesia			X	United Kingdom	X	X	X
Iran			X	United States		X	X
Iraq			X	Upper Volta			X
Ireland	x	x	X	Uruguay	X		X
Israel	X	X	X	Venezuela	X	X	
Italy	x	X	X	Viet Nam			X
Ivory Coast	X		X	Yugoslavia	X	X	X
Japan	x	x	X	Zaire	X		X
Jordan			X	Zambia		X	X
Kenya		X	X	Zimbabwe	x		X

SOURCE Office of Technology Assessment

erty agreements. This harmonization was possible because each of the national systems shared a common set of goals. In general, nations have advanced four major rationales to justify intellectual property protection. These have generally been accepted in most countries, but nations weigh them differently.[5]

Based on these justifications, three traditions of intellectual property law have evolved. These include: the droit d'auteur system, which places the emphasis on the principles of natural justice; the Anglo-Saxon or copyright system, which is based on economic arguments; and the socialist system, which places the emphasis on socialist doctrine and the importance of the author in terms of his social role. There are, however, considerable variations among different countries that follow the same system.[6] Although both the justifications for and the actual systems of protection may differ from nation to nation, overall international agreement is possible because the end result or goal is the same–to protect intellectual property.

Principle of National Treatment

The second shared characteristic of these international agreements is the principle of national treatment. In practice, this principle was adopted to achieve two goals: 1) to facilitate international judicial interpretation; and 2) to unify laws among countries that offer differing levels of protection.[7]

National treatment facilitates international judicial interpretation because it requires that judicial decisions be made within the country where the rights holder seeks protection, regardless of his nationality. As a result, judgments are more consistent and more certain; the courts can more effectively interpret their own laws as opposed to those of other nations.

Second, many nations adhere to national treatment because they believe it leads to better political relations and unifies levels of protection among countries. Nations believe that this will occur because rights owners in countries of low-level protection, who receive higher levels of protection in other countries, will press their governments to raise their domestic levels of protection. Thus, it is believed that national treatment will give rise to a more unified and higher common level of protection among nations.

Minimum Rights

All international intellectual property agreements also establish a common set of minimum rights that may be claimed in all adhering countries, regardless of national legislation. Although convention countries are not required to grant minimum rights to their own nationals, all foreign member country nationals are entitled to these minimum rights. These minimum rights attempt to ensure that national treatment does not lead to any imbalances in levels of protection among nations. Without them, national treatment, which exclusively calls for equal treatment of foreigners and nationals within a convention country, could not prevent large discrepancies in levels of protection among countries.[8] Consequently, mini-

[5]"First, the principle of natural justice says that the author is the creator of the work, which is the expression of his personality, and therefore he should decide whether and how his work is commercialized and prevent any injury and mutilation of his intellectual offspring. The royalties he receives are the wages for his intellectual work, Second, the economic justification for protection is based on the argument that the investment in creating works, as well as in disseminating them to the public, would not be undertaken unless creators have a reasonable expectation of recouping investments and earning a reasonable profit. The third justification for protection is based on the argument that creative works are a considerable national asset, and therefore it is in the public interest to encourage and reward creativity as a contribution to the national culture. The fourth is based on a social argument that the dissemination of works to many diverse sectors of the public improves social cohesion and advances the society. Stephen Stewart, *The Law of International Copyright and Neighboring Rights* (London: Butterworth & Co. (Publishers) Ltd., 1983), pp. 3-6.

[6]Stephen Stewart, *The Law of International Copyright and Neighboring Rights* (London: Butterworth & Co. (Publishers) Ltd., 1983), pp. 6-11.

[7]Ibid., p. 39.

[8]"The principle of national treatment without minimum rights might produce a serious imbalance which States would find unacceptable. For example:

> If countries A and B were members of a [international] convention which provides only for national treatment and has no minimum rights and country A grants performance and broadcasting rights as well as a reproduction right, the effect would be that the nationals of country B would enjoy performance and broadcasting rights in country A, but nationals of country A would

[continued on next page)

mum rights work in conjunction with national treatment to achieve the greatest possible uniformity of intellectual property protection among countries.[9]

Minimum rights also provide a flexible mechanism for unifying and increasing levels of international protection as needed. Starting with a small number of minimum rights, a convention can add others as new rights are required and as the level of international agreement rises. For example, beginning with the translation right, the Berne Convention later added the rights of public performance and broadcasting, the droit moral (moral rights), and the cinematographic right. The Universal Copyright Convention (1952 text) originally provided only for the translation right; its revised version (1971 text) added the reproduction right, the broadcasting right, and the public performance right. ""

The harmonization of different national intellectual property systems, the principle of national treatment, and minimum rights have enabled the periodic revision of international conventions, which has given the international system the flexibility needed to adapt over time to technological change and changing attitudes about intellectual property protection. However, with the development of many new ways of creating, reproducing, and exploiting intellectual works, the international intellectual property system is currently experiencing a number of new and perhaps more serious stresses. Questions arise, therefore, as to whether U.S. domestic policy and participation in the existing international system can deal with such changes.

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not enjoy these rights in country B because the nationals of country B do not enjoy them either. This could produce a serious disequilibrium which would be unacceptable to country A.

Ibid., pp. 40-41.

[9] A history of copyright and neighboring rights bears this out . . . When the Universal Copyright was negotiated 60 years after [the Berne Convention], the difference in the level of protection with rights covered by the convention became less marked, and thus less stringent measures to insure against unacceptable differences in the level of protection were required.

Ibid., p. 40.

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"[bid., p. 40.

STRESSES ON THE INTERNATIONAL INTELLECTUAL PROPERTY SYSTEM

Recent technological developments are creating pressures on the international intellectual property system. Such developments and their effects include:

1. the increasing flow of information and information-based products and services among nations;
2. the growing economic importance of information and related products and services, both within and between nations;
3. the increasing cultural and political significance of information and related products and services;
4. the emergence of new information-based products and services that do not correspond to traditional categories of protection;
5. the increasing difficulty of enforcing intellectual property rights at the international level; and
6. the growing convergence of international intellectual property issues with other international issues.

Greater in magnitude than those of the past, today's technological developments pose novel difficulties that challenge the relative stability of the international system. Such developments affect not only the international legal system, but also international economic and political relations. Consequently, these developments may affect the U.S. role in the international intellectual property system as well as domestic intellectual property policy. A brief description of these developments and

their potential implications for U.S. international and domestic policies are provided below.

Increasing Flows of Information and Information-Based Products and Services Between Nations

Technological advances in and the growing convergence of information and communication technologies have greatly increased the flow of information and information-based products and services across national borders. Increases in international trade, as well as the development of satellite, broadcast, fiber optics, and other telecommunication technologies, have combined with more powerful information storage, processing, and distribution technologies to bring about international exchanges of intellectual property. As illustrated in figure 8-1, these developments have led to greater international exchanges of information and technology and international interdependence.

Although exact measurements of computerized data flows are difficult to attain, many inquiries reveal that their rate of growth exceeds the growth rate of nonvoice communications.[11] The growing number of installed terminals, telecommunication facilities, database searches, and computer services all reflect the increasing flow of information.

For example, the number of network terminating points (points of connection between user equipment and telecommunication transmission facilities) in Western Europe increased from 393,000 in 1979 to 832,000 in 1983 and is projected to reach 1,620,000 in 1987. The total number of bits sent per average working day grew from 1,310 billion in 1979 to 3,970 billion 1983 and is expected to reach 9,820 billion in 1987. In North America and Western Europe, the number of data searches increased from 3.3 million in 1973 to 12.5 million in 1976[13] and the number of users of database services increased from 10,000 in 1965 to 2 million in 1978.[14] Exports by U.S. information services companies increased by 9 percent between 1982 and 1983, and are expected to continue to increase by 9 percent annually through 1987.[15] The U.S. software industry also reported an increase in exports that represented 30 percent of total sales by 1982.[16] In addition, the use of satellite technology is greatly increasing the electronic exchange of entertainment programs internationally. Sky Channel, for example, provides by satellite many European cable systems with programs intended for the entire European market.[17] Estimates place the 1985 transatlantic flow of television programs at approximately 20,000 to 30,000 hours annually.[18]

Other indications of international information exchanges are reflected in increases in international trade of computers and telecommunication equipment, as well as by the growing international exchange of patents, scientific information, technology, and cultural products. " For example, between 1978 and 1982, U.S. exports and imports of computers and equipment increased by 21.2 and 29.8 percent, respectively .20 U.S. exports and imports

Cees J. Hamelink, *Translational Data Flows in the Information Age* (Sweden: Studentlitteratur AB, Chartwell-Bratt Ltd., 1984), p. 44.

"M. Benedetti, "Eurodata '79: The Growth of Data Communications in Western Europe, paper for the I B I Conference on Transborder Flow Policies, Rome, June 1980.

' 'Paul B. Silverman, "international Telecommunications as a Tool for Technology Transfer, paper for the Technology Exchange '78, Atlanta, February 1978.

"P.]. van Velse, "Aspects of a European Information Industry, paper for the Commission of the European Communities, Luxembourg, September 1979.

[15]U.S. Department of Commerce, International Trade Administration, "A Competitive Assessment of the U.S. Information Services Industry' (Washington, DC: (J. S. Government Printing Office, 1984), p. 35.

[16]U.S. Department of Commerce, International Trade Administration, "A Competitive Assessment of the U.S. Software Industry' (Washington DC: U.S. Government Printing office, 1984), p. 35.

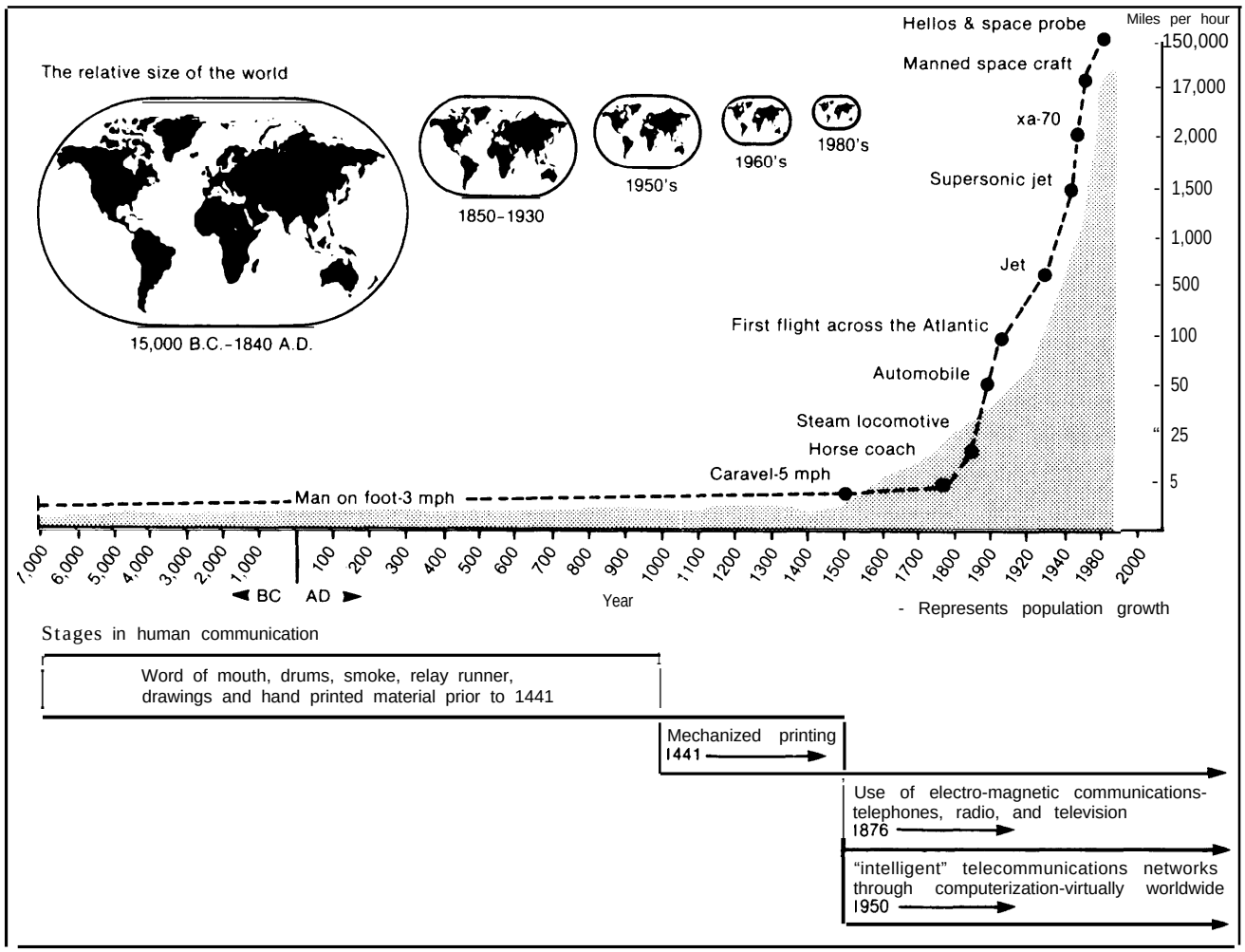
"Michael Schrage, "Murdoch Reaches for Sky in European TV Battle, " *The Washington Post*, Mar. 3, 1985, p. F, 1, 6, 7.

[18]Kalba Bowen Associates, *The Economist: Connections: World Communications Report, No. 32*, May 24, 1985, p. 8.

"For a detailed analysis of these trends, see U.S. Congress, Office of Technology Assessment, *Information Technology R&D: Critical Trends and Issues*, OTA-CIT-268 (Washington DC: U.S. Government Printing Office, February 1985).

[20]U.S. Department of Commerce, International Trade Administration, "High Technology Industries: Profiles and Outlooks: The Computer Industry" (Washington DC: U.S. Government Printing office, 1983), p. 24.

Figure 8-1.—Shrinking of Our Planet by Humans' Increased Travel and Communications



SOURCE: John McHale, World *Facts* and Trends (New York: Collier Books, 1972), p 3, as cited in Magda Cordell McHale, Facts *and Trends: The Changing Information Environment: An Information* **Chartbook** (Rome Intergovernmental Bureau for Informatics, 1985), p 2.

of telecommunication equipment increased from 1977 to 1983 by 22.1 and 35.3 percent, respectively .[21] Between 1966 and 1981, the number of U.S. patents granted to foreign nationals increased from 13,722 to 26,546.[22] The U.S. use of foreign scientific and technical literature increased 6 percent between 1973 and 1980;[23] the U.S. technology transfer exports (patents and management or consulting fees) equaled approximately $3,034 million in 1973.[24] U.S. exports of cultural products (motion pictures, television programming, prerecorded entertainment, published materials) have also grown dramatically over the last few years: for example, the foreign revenues for U.S. motion

[21]U.S. Department of Commerce, International Trade Administration, "High Technology Industries: Profiles and Outlooks: The Telecommunications industry" (Washington DC: U.S. Government Printing Office, 1983), p. 21.

[22]National Science Board, National Science Foundation, *Science Indicators-1982* (Washington DC: U.S. Government Printing Office, 1983), p. 206; and Office of Technology Assessment and Forecast, U.S. Patent and Trademark Office, "Indicators of the Patent Output of U.S. Industry IV (1963 -81)," 1982.

[23]National Science Board, National Science Foundation, Science *Indicators-1982* (Washington DC: U.S. Government Printing Office, 1983), p. 12.

"Marc Uri Porat, "Global Implications of the Information Society, " *Journal of Communications,* winter 1978, p. 78,

picture studios rose from $820 million to $1,420 million from 1978 to 1983.[25]

Policy Implications

The increasing flow of information and information-based products and services are breaking down national boundaries, thus challenging the traditional theories of international relations, which are based on the nation-state.[26] With the erosion of national sovereignty, events taking place in one country will increasingly be felt in others. Consequently, intellectual property decisions, that were once considered exclusively domestic concerns, will now have to be made with international considerations in mind.

Currently, U.S. participation in international intellectual property fora is relatively limited. No longer a party to the United Nations Educational and Cultural Organization (UNESCO), the United States might not have as much political leverage in the Universal Copyright Convention (UCC), which is administered by UNESCO.[27] Although the U.S. withdrawal does not preclude the United States from observing UCC activities, it does prevent the United States from participating in the UNESCO General Conference, which reviews and approves the various budgets and administrative bodies of UNESCO, including the Copyright Division. As a result, the U.S. abilit y to influence other nations in its favor might be weakened. Because the United States is no longer funding UNESCO activities, a reduction in funding for studies on emerging copyright issues which are traditionally sponsored by the UCC might also occur. Moreover, the United States might lose some of its ability to influence decisions about which substantive issues such studies will address. For example, recent U.S. efforts to convince the UCC Intergovernmental Committee to undertake studies on the copyrightability of computer software have not yet been successful.

Magnifying the problems arising out of the U.S. withdrawal from UNESCO is the fact that the United States is not a member of the only other major international copyright convention, the Berne Convention. Although, over time, the United States has amended its domestic copyright laws to be more compatible with those of the Berne Convention, several major attributes of U.S. copyright law impede U.S. ratification of the Berne Convention. These attributes include, for example, the formalities required to obtain protection under U.S. copyright law, such as registration and those enumerated in the manufacturing clause.[28] As a nonmember of the Berne Convention, the United States can only observe Berne policy decisions; it cannot directly influence the development of policy concerning international protection of new technologies.

Given the increasing internationalization of intellectual property issues, the United States may want to take greater steps to influence their resolution. There are several options the United States might pursue to strengthen its presence in international intellectual property organizations. First, the United States might consider rejoining UNESCO. Because UNESCO houses not only the governing body of the Universal Copyright Convention, but also other agencies that oversee related matters of international information and communications policy, joining UNESCO might place the United States in a more advantageous position from

[25] CBS, inc., "Trade Barriers to U.S. Motion Picture and Television, Prerecorded Entertainment, Publishing and Advertising Industries," September 1984, p. 10.

[26] The theory of the nation-state or the state-as-the-only actor approach was first advanced by Arnold Wolfers. According to his theory, the most important characteristic of States is their sovereignty, which is considered indivisible and absolute. The model further implies that because States do not recognize any higher authority, they are consistently in an international state of conflict and competition. Consequently, there is almost a complete separation between politics within nations and politics between nations. Arnold Wolfers, *Discord and Collaboration: Essays in International Politics* (Baltimore: Johns Hopkins University Press, 1962).

[27] The increasing politicization that polarized UNESCO was a major impetus of the U.S. decision to withdraw from UNESCO in late 1984. Seymour Finger, "Reform or Withdrawal," *Foreign Service Journal*, vol. 61, June 1984, pp. 18-23.

[28] "Statement of Ralph Oman, Register of Copyrights, Assistant Librarian for Copyright Services, Library of Congress, Hearing on S. 1822 and S. 1938 Bills to Make Permanent the Manufacturing Clause of the Copyright Act, before the Subcommittee on Patents, Copyrights and Trademarks, Senate Committee on the Judiciary, Jan. 21, 1986, p. 35.

which to influence the decisionmaking process of such agencies, Rejoining UNESCO, moreover, might relieve much of the resentment harbored by many developing countries for the United States and its historical lack of international participation in the international intellectual property system.

Rejoining UNESCO, however, is not without political and economic tradeoffs. Additional funding, for example, would be required if the United States were to become a member of UNESCO. In addition, the United States would most likely need to make further political and perhaps economic concessions to address the concerns of the developing nations.

A second option to strengthen U.S. participation in the international intellectual property system would be to ratify the Berne Convention. This would benefit U.S. international copyright relations in several ways. First, the administrator of the Berne Convention, the World Intellectual Property Organization (WIPO), would provide a more favorable forum for dealing with international intellectual property issues because it specializes only in intellectual property rights and it is considered to be less politicized than UNESCO. Second, the Berne Convention provides the highest levels of international copyright protection. Third, ratification of the Berne Convention would also provide the United States with the opportunity to influence major policy development with regard to new technologies. Finally, joining the Berne Convention would show other nations, particularly developing nations, that the United States is indeed very committed to the protection of international intellectual property rights and that it is cognizant of the growing need for its system of intellectual property rights to operate within an international context.[29] For these reasons and others, there is wide agreement among those dealing with intellectual property issues, particularly at the international level, that a number of benefits would accrue to the United States if were to adhere to the Berne Convention.[30]

At the same time, there are several tradeoffs associated with U.S. ratification of the Berne Convention. The major disadvantage of signing would be the legislative adjustments needed to bring the present U.S. copyright law into compliance with the Berne Convention. Although Congress has over the years sought to make U.S. law more compatible, several legal adjustments are still required. These include the need to remove copyright formalities embodied in the U.S. law—such as notice and deposit, compulsory licenses, and the manufacturing clause— and the need to add moral rights.[31] The Department of State's Ad Hoc Working Group on U.S. Adherence to the Berne Convention, which is made up of representatives of the copyright community, is currently exploring how these adjustments can be made while preserving traditional U.S. laws and practices as much as possible.

Growing Importance of Information and Information-Based Products and Services to National Economies and International Trade and Competitiveness

Historically, all nations have viewed the creation of intellectual works as having great cul-

[29] Donald Quigg, Acting Assistant Secretary and Commissioner of Patents and Trademarks, testimony on "U.S. Adherence to The Berne Convention, " before the Subcommittee on Patents, Copyrights, and Trademarks, Senate Committee on the Judiciary, May 16, 1985.

[30] "For example, at the Sept. 12, 1984, meeting of the Department of State's International Copyright Advisory Panel, the private sector representatives from all different parts of the intellectual property community were unanimous in their support for U.S. adherence to the Berne Convention. Moreover, all of the witnesses who testified before the Subcommittee on Patents, Copyrights, and Trademarks, Senate Committee on the Judiciary, expressed their support for U.S. adherence to the Berne Convention. Hearing on "U.S. Adherence to The Berne Convention, " before the Subcommittee on Patents, Copyrights, and Trademarks, Senate Committee on the Judiciary, May 16, 1985.

[31] "The importance of maintaining the attributes of U.S. copyright law, such as deposit, registration, and recordation provisions can scarcely be questioned. For these provisions have served a most important public function; they have enabled the Library of Congress to become the most important repository for U.S. cultural expression as well as for the rest of the world. " Donald Curran, Associate Librarian of Congress and Acting Register of Copyrights, Copyright Office, testimony before the Subcommittee on Patents, Copyrights, and Trademark, Senate Committee on the Judiciary, May 16, 1985.

tural and social significance. Recently, however, intellectual products are becoming an increasingly important component of national and international economies .[32] A recent study on the size of the copyright industries reflects the same trend. These industries, which rely on the exploitation of the legal protections embodied in the copyright law, showed growth in sales from $6.2 million, or 2 percent of the gross national product (GNP), in 1954 to $140.9 billion, or approximately 5 percent of the GNP, in 1982.[33] An additional $11.3 billion would be added if semiconductor chips were included. Estimates of the U.S. labor force involved in the copyright industries suggest that more that 2.2 million workers are affected by trade in intellectual property .[34] The U.S. Department of Commerce also estimates that in 1983, the United States enjoyed a $4.7 billion favorable balance of payments in the licensing and assignment of patent rights, trademarks, and copyrights. [35]

Information and information-based products and services are not only valuable economic commodities in and of themselves; their use also increasingly affects the performance of other economic sectors. The application of information technology is responsible for vast increases in productivity y in manufacturing industries, offices, financial services, and scientific research.[36] Because they have become not only an important component in the U.S. economy, but also a significant productivity factor in many industrial sectors, information and information-based products and services have become an extremely crucial element in the U.S. economy and its overall international competitiveness.[37]

Just as information and information-based products and services are of increased value to national economies, they are also becoming more important to the world economy. Recent evaluations have found that this complex of information industries is already the third largest in the world economy. In 1980, each of the industrialized nations spent approximately 4 or 5 percent of its GNP on information-based products and services.[38] Figure 8-2 illustrates the large number of sectors in which many nations are using information technologies. Another estimate notes that the world information market equaled approximately $350 billion or 18 percent of world trade in 1980.[39]

Policy Implications

Given the growing importance of information and information-based products and services to the U.S. economy, its export markets, and thus to its international competitiveness, intellectual property rights are acquiring greater significance. Policy makers are now recog-

Several major studies completed over the last several years document this trend. Daniel Bell was one of the first to describe the changing role of information in society: "And if capital and labor are the major structural features of industrial society, information and knowledge are those of the post-industrial society. Daniel Bell, *The* Corning of Post *Industrial Society (New* York: Basic Books, 1976), p. xiii. A quantitative study by Marc Porat found that by 1967, the primary and secondary production, processing, and distribution of information-based products and services constituted approximately 46 percent of the G N P and that nearly half of the labor force is engaged with informational activities. Marc Uri Porat, Office of Telecommunications, U.S. Department of Commerce, "The Information Economy: Definition and Measurement" (Washington DC: U.S. Government Printing Office, 1 977).

[32]Michael H. Rubin, *"The Copyright Industries in the United States: An Economic Report Prepared for the American Copyright Council, " 1985, p. 1.

[33]U.S. Copyright Office, "The Size of the Copyright Industries in the United States, " Subcommittee on Patents, Copyrights, and Trademarks, Senate Committee on the Judiciary, December 1984.

[34]Eileen Hill, *"Commerce Department Seeks Greater Protection for U.S. Intellectual Property Rights, " *Business America*, Mar. 18, 1985, **p. 3.**

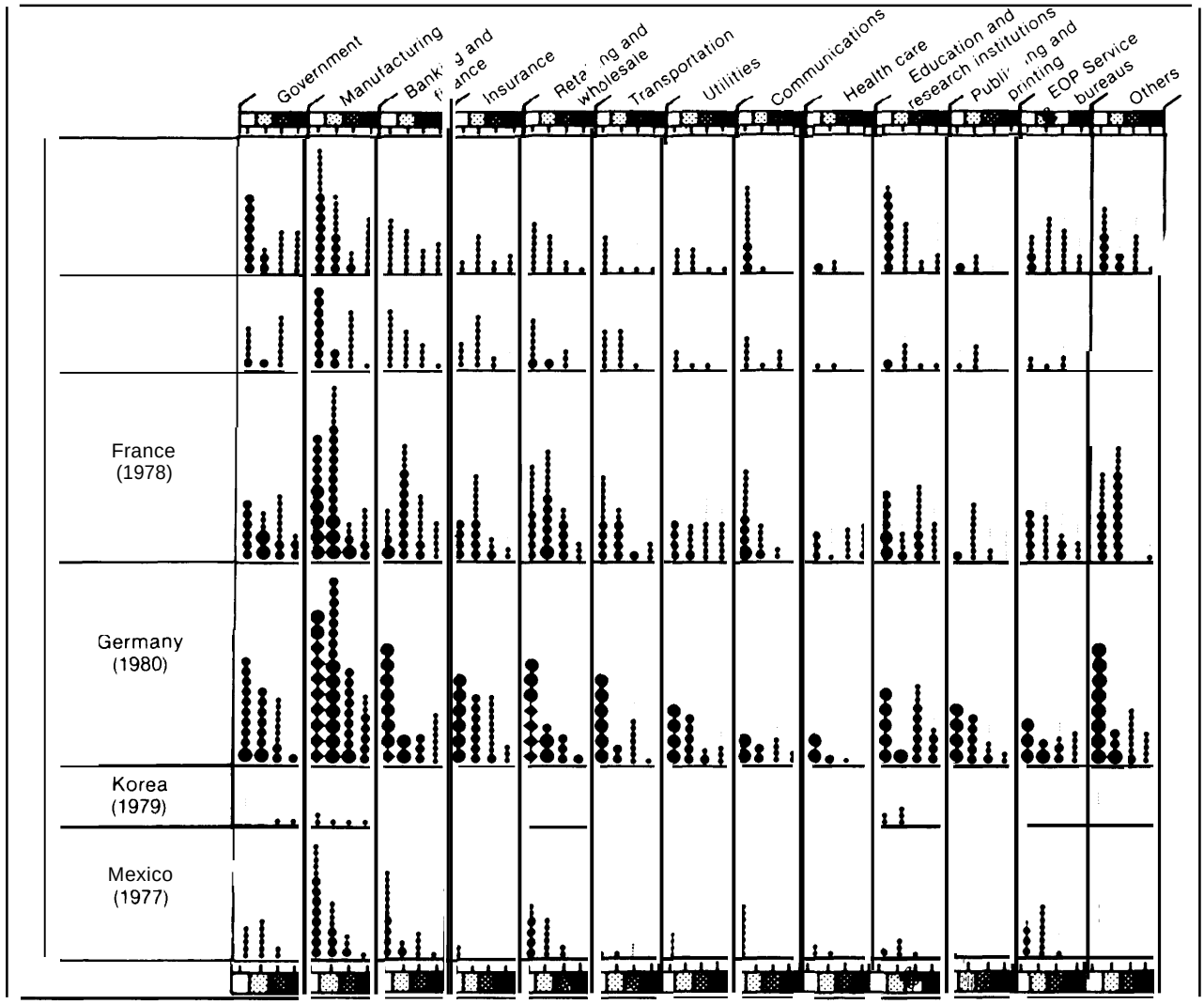
"One economist documented these trends by showing that the introduction of information technology has made work more specialized and efficient, which in turn has led to greater productivity. Thus, the analysis showed that the quantity of real output produced by each production-sector worker in the U.S. economy was 6.4 times greater in the year 1970 than in 1900. Charles Jonscher, "Information Resources and Economic Productivity," *Information Economics and Public Policy*, vol. 1, No. 1, 1983, **p. 21.**

[36]The President's Commission on Industrial Competitiveness, Committee on Research, Development, and Manufacturing, Appendix D, "Preserving America's Industrial Competitiveness-A Special Report on the Protection of Intellectual Property Rights, " October 1984.

[37]Edward W. Ploman and 1.. Clark Hamilton, *Copyright: Intellectual Property in the Information Age* (London: Routledge & Kegan Paul, 1980], p. 217.

[38]Cees J. Hamelink, *Transnational Data Flows in an Information Age* i Sweden: Studentlitt.eratur Ab Chartwell-Bratt Ltd., **1984), p. 23.**

Figure 8-2.—Computer Utilization: Selected Countries, 13 Sectors



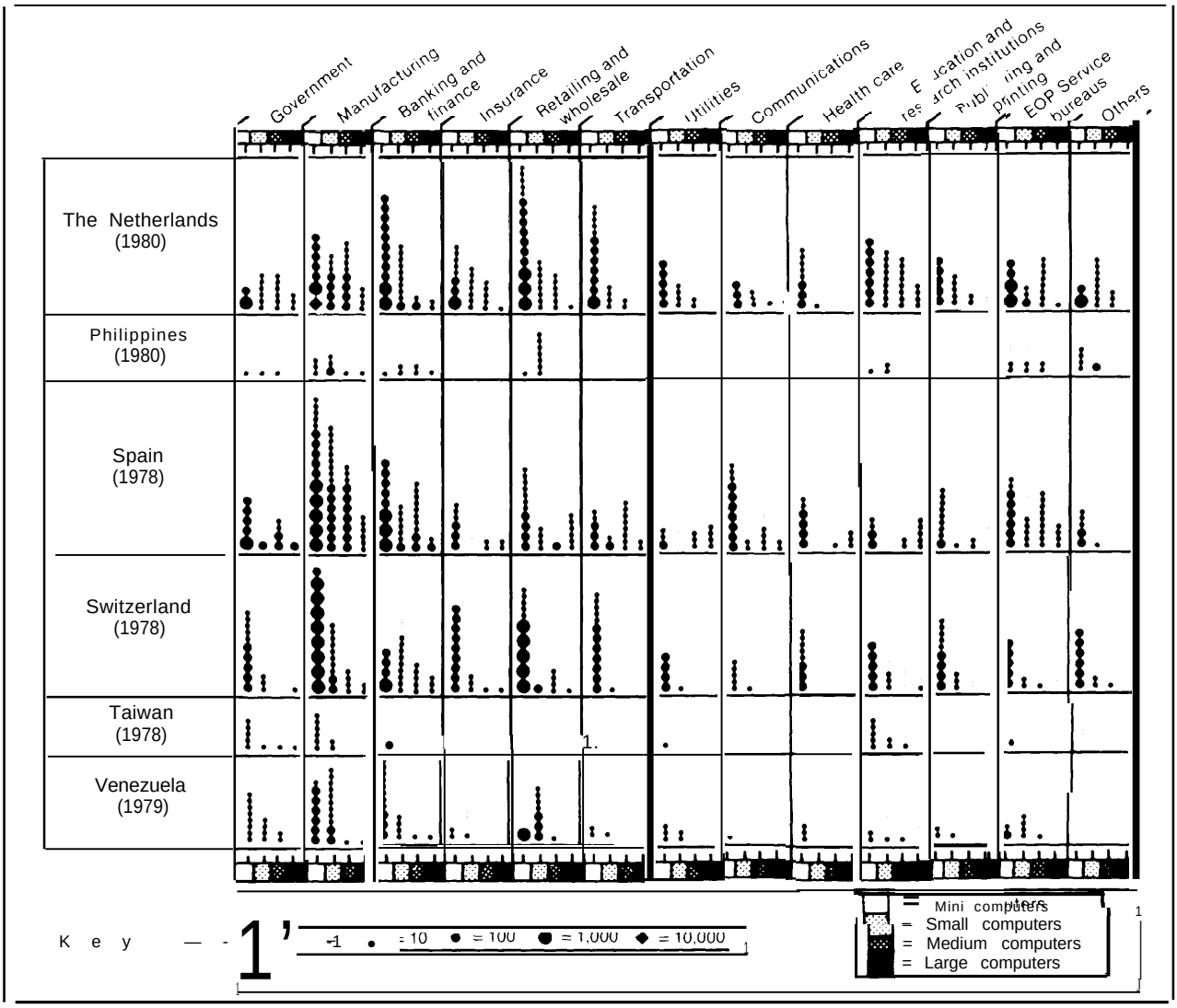
nizing the importance of factoring intellectual property protection into bilateral and multilateral trade relations. Similarly, international trade concerns are looming larger in international intellectual property relations. Such growing linkages may call for greater attention to these relationships and new ways of coordinating and addressing the issues to which they give rise. Thus, the United States might need to reassess its intellectual property policy at the national and international levels to accommodate these new linkages.

The United States has already taken some steps toward recognizing the protection of intellectual property rights as a major trade issue. The recent passage of the Trade and Tariff Act of 1984 (Public Law 98-573), for example, allows the President to take into account nations' laws and practices to adequately protect intellectual property rights as a condition for receiving the trade preferences granted under the Generalized System of Preferences Program (GSP).[40] In addition, the Car-

[40]The Trade and Tariff Act of 1984 contains five provisions

(continued on next page)

Figure 8-2.— Computer Utilization: Selected Countries, 13 Sectors—Continued



SOURCE U S Department of Commerce, International Trade Administration, Computers *and Peripheral Equipment* — Various *Countries* (Washington, DC U S Govern. ment Printing Office, 1980), as cited in Magda Cordell McHale, *Facts and Trends: The Changing Informatfin* Environment: An informatron Char/book (Rome Intergovernmental Bureau for Informatics, 1985), p 32

ibbean Basin Economic Recovery Act (Public Law 98-67) makes the protection of U.S. copyrighted broadcast works a condition for Caribbean nations to receive U.S. aid.

(continued from previous page)

related to intellectual property protection. Many of the countries that are eligible for GSP benefits are also those countries which do not adequately protect intellectual property rights. These countries include, for example, Argentina, Bangladesh, Brazil, Chile, Colombia, Costa Rica, Egypt, Ecuador, Guatemala, India, Indonesia, Korea, Mexico, Pakistan, Peru, the Philippines, Portugal, Sri Lanka, Taiwan, Thailand, Turkey, Uruguay, Venezuela, and Yugoslavia.

A number of other strategies are also available to strengthen trade opportunities for U.S. intellectual property products. One such option is to prevent imports of illicit copies of U.S. products or products illicitly manufactured with U.S. patented processes. The proposed Process Patent Amendment of 1985 (S. 1543 and H.R. 1069), for example, would make it a violation of patent law to use, sell, or import any product made overseas that is produced by an unlicensed patent process.

Another recently proposed option is to include information products and services within the General Agreement on Tariffs and Trade (GATT). This option has broad support for several reasons. First, including intellectual property products in the GATT could provide international enforcement mechanisms in the form of dispute settlement mechanisms and trade sanctions as final retaliatory mechanisms for dealing with infringements—mechanisms that are not currently provided in international intellectual property agreements. Second, unlike many international intellectual property agreements, the GATT has a broad representation of the industrialized and developing nations as well as a history of consensus-building among its member states. Third, the GATT takes into account the economic development needs of the developing countries, allowing them differential treatment as a means of assisting their development.

There are, however, some negative aspects to such approaches. Linking the granting of trade preferences or foreign aid to the protection of intellectual property rights might provoke political discord between the United States and developing nations. Including intellectual property products within the GATT also conflicts with many developing countries' notions of information and information-based products and services and might lead to political unrest and various forms of retaliation.

Increasing Cultural and Political Significance of Information and Information-Based Products and Services

Historically, there have been political tensions between nations whose role as producers of intellectual property allowed them greater access to such products and nations that imported intellectual property products, and had only limited access to them. When the United States was still a relatively young and developing country, for example, it refused to respect international intellectual property rights on the grounds that it was freely entitled to foreign works to further its social and economic development.

Developing nations make the same argument today. Many believe they should be exempt from measures protecting intellectual property created outside their borders. They argue that access to information is vital to their development. Championing this viewpoint, developing nations were able to get revisions in the Berne Convention at Stockholm in 1967 and in the Universal Copyright Convention in 1971. Moreover, the influence of these countries has been felt at meetings of the United Nations Conference on Trade and Development (UNCTAD) and at the recent meeting to revise the Paris Industrial Property Convention.[41]

As information and information-based products and services become more important to social and economic development, questions of information access, which were formerly quite distinct from political considerations, are acquiring greater political significance.[42] Because both developed and developing nations view intellectual property protections as a major mechanism for regulating and controlling the flow of and access to information and information-based products and services, there is growing political pressure on the international intellectual property system.[43]

A case in point is the information gathered by remote sensing satellites. In 1972 the United States launched the Land Remote Sensing Satellite (Landsat) as part of a broader resource

[41] "For example, the provisions for developing nations that were added to the Universal Copyright Convention in 1971 include exemptions that fall into three categories: 1) translation rights subject to compulsory licensing; 2) reprint rights subject to compulsory licensing; and 3) compulsory licensing in general. Subcommittee on Patents, Copyrights, and Trademarks, Senate Committee on the Judiciary, hearing on "Oversight on International Copyrights, " Sept. **24, 1984,** pp. 61-62.

[42] Rita Cruise O'Brien and G. K. Helleiner, "The Political Economy of Information in a Changing International Economic Order, " *International Organization, vol. 34, No. 4,* Autumn 1980, p. 446.

[43] These access tensions, for example, have given rise to discussions of a New World Information Order in which developing nations call for freer access to technical and educational materials as well as a redress of the imbalances in the international flow of news and cultural products and a New World International Economic Order which calls for greater controls over and access to technology transfer to Third World nations. Both of these orders are intended to strengthen the self-sufficiency of developing nations.

monitoring and assessment system .[44] Uncopyrightable raw data on all countries generated by this series on the Earth Resources Satellite Program are disseminated to governments, firms, or individuals at very low prices. As Landsat is currently being transferred from government ownership to the private sector, data that have been processed and analyzed (by private sources), and thus are copyrightable, such as field-by-field analyses of croplands, blight, drought, and mineral resources, are available at a much higher price. Because less developed nations have difficulty paying these prices, or lack the computer technologies needed to process and interpret the data themselves, they often cannot gain access to such data. As a result, they believe that they are potentially at a disadvantage in world agricultural commodity markets, where private firms and wealthier governments can afford and use the data to make more well-informed, strategic decisions:

> The importance of information lies in its role as a central factor in decision-making, including all matters related to development. Information is a precondition for identifying alternatives, reducing uncertainties about their implications, and facilitating their implementation. As such, information is a critical resource, not least for enhancing the negotiating capabilities of developing countries in the pursuit of clearly defined objectives, in particular in dealing with translational corporations.[45]

Many governments of developing countries also view information-processing and communication technologies as means to achieve major societal goals. Likening these technologies to a change in the "entire nervous system of social organization, many governments consider the establishment of information infrastructures to be crucial for development.[46] These nations want to use information and communication technologies for such things as: national integration; administrative effectiveness; the delivery of formal and informal education; teacher training; agricultural information; medical and health care services; region-specific cultural programming; and coping with natural disasters.[47] Many developing countries believe, therefore, that international intellectual property protection, which can act as a regulator of information flows, might inhibit such use and act as a barrier to development.

For these same reasons, many developing countries are wary of certain product patents. They contend that royalty payments required by patents should be relaxed for products that are necessary for development, and in some cases, human survival.[48] Many industrialized nations oppose this point of view. Having incurred large costs in the research and development of products, they believe they are entitled to recoup their investments by selling in foreign markets.

One product that caused such a problem is the patented pharmaceutical product Tagamet (generic name, cimetadine, an anti-ulcer drug), developed by the U.S. company SmithKline-Beckman. By the time the company was ready to market its product in Argentina, 48 percent of its market had already been undercut by a local firm selling the product at a much lower price. Due to Argentina's lack of patent protection for pharmaceuticals, the local companies could take the product and sell it at a lower price because they did not have to recoup development costs or pay royalty fees. Smith-

[44]For a detailed analysis of international remote sensing satellite issues, see U.S. Congress, Office of Technology Assessment, *Remote Sensing and the Private Sector: Issues for Discussion– A Technical Memorandum,* OTA-TM-I SC-20 (Washington, DC: U.S. Government Printing Office, March 1984).

[45]United Nations Center for Transnational Corporations, *Transborder Data Flows: Access to the International On-1ine Database Market (New* York: United Nations, 1983).

[46]Simon Nora and Alain Mine, *The Computerization of Society* (Cambridge, MA: MIT Press, 1980).

[47]Jorg Becker, *Information Technology and a New International Order* (Sweden: Studentlitteratur AB, Chartwell-Bratt Ltd., 1984), pp. 109-111.

[48]Because many developing nations believe they need to acquire technology from the advanced nations, they tend to retain patent, trademark, and copyright laws because they provide some security that helps to continue to attract foreign enterprise. However, the intellectual property protection is frequently modified. They may offer, for example, compulsory license requirements, curbs on the manner in which the royalties are paid, exclusion of certain products or subject matter from protection, or official examination of the terms on which foreign rights owners establish their own local operations or grant licenses to local enterprises. W.R. Cornish, *Intellectual Property: Patents, Copyright, Trademark, and Allied Rights* (London: Sweet & Maxwell, 1981), p. 17.

Kline-Beckman claimed it lost approximately $50 million in revenues because of the lack of patent protection in many developing nations.[49]

Growing political tensions between nations are also occurring with regard to intellectual property rights for plants. The United States and the other industrialized nations have no native primary crops. As a result, Western nations have traditionally used plant varieties from the Third World to genetically engineer new and better seeds for farm crops. Because many of the developing nations do not have the technology for seed development, they are generally forced to buy many of these genetically engineered seeds from the industrialized nations. Political tensions between nations arise because developing nations believe that the industrialized nations are exploiting the Third World's natural resources. They attribute the problem to the granting of intellectual property rights:

> How is it that we farmers [from the Middle East] spent 10,000 years cultivating and breeding our plants, then someone else from the West works on it for 10 years, and only then is it called "intellectual property" and becomes patentable?[50]

Although most tensions arising out of intellectual property rights have been primarily between industrialized and less developed nations, political issues related to such rights have recently begun to emerge between developed nations as well. A case in point involves the Strategic Defense Initiative (SDI) research program. Among other goals, political comity and support among nations for defense are major goals of the SDI research program. For this reason, the United States is seeking other nations' cooperation and participation in the SDI research program.

However, one of the major impediments to gaining the support of other nations is the issue of ownership of technology. For example, the United Kingdom made it clear to the United States that it would not participate in the SDI program unless the terms for the rights to the technology were stipulated at the outset of the research. The United States, however, believes that this would be incompatible with the Defense Department's regulations, which do not allow blanket patent and technology transfer guarantees and require consideration on a case-by-case basis. Thus, intellectual property rights are the source of some political pressures among nations and may actually preclude international political cooperation and participation in the SDI program.[51]

Policy Implications

There are no simple solutions to the political issues raised by intellectual property rights. Although U.S. economic interests would most likely be served better by strict enforcement of intellectual property protections in other nations, political relations may also be a consideration. Many U.S. intellectual property products, for example, help promote U.S. culture abroad:

> Books have unique qualities enabling them to provide foreigners substantive perceptions and insight into American society and government policies which they can get no other way. . . [T]hey smooth the path for the pursuit of our foreign policies. It has been said that next to people, books are our best ambassadors of international enlightenment and goodwill.[52]

"Gerald Mossinghoff, President of the Pharmaceutical Manufacturers Association, testimony "On the Beneficiary Country Practices," before the General System of Preferences Subcommittee of the Trade Policy Committee, June 24, 1985.

[50]Phillip Hilts, "Battles Sprout Over World Seed Supply: Bureaucrats and Nations Grapple With Charges of Neglect and Genetic Imperialism," *The Washington Post, Nov. 4, 1985,* p. A3.

[51]Karen DeYoung, "British, American Officials Hit Snags on SDI Cooperation: Allies at Odds Over Contract Terms, Ownership of Technology," *The Washington Post,* Oct. 26, 1985, A5.

[52]Curtis Benjamin, *U.S. Books Abroad: Neglected Ambassadors* (Washington, DC: U.S. Library of Congress, 1983), p. 72. Recognizing the importance of books to increased understanding of the United States, the U.S. Government through the U.S. Information Agency distributes books worldwide in 57 languages; by 1971 it had published and disseminated 19,220 editions totaling 157,200.000 copies. Nicholas Henry, *Copyright, Information Technology, Public Policy, Part 1: Copyright-Public Policies (New* York: Marcel Dekker, Inc., 1967), p. 5.

Similarly, copyrighted musical works, audiovisual works, sound recordings, and patented technical works also further international understanding and an appreciation of U.S. culture, and so might aid U.S. relations with both developing and industrialized nations.

Although many consider it unfair to expect producers of intellectual property to absorb large losses in international markets in order to foster international relations, the cultural and political significance of these products might require striking a new balance between producers and importers of intellectual property products. Political and cultural considerations as well as economic concerns might need to be taken into account when adjusting the international intellectual property system. These considerations might also need to be factored into U.S. domestic intellectual property policy and international trade and political relations.

Recognizing how important U.S. cultural and educational products are to its relations with other nations, the United States has established several programs within the U.S. Information Agency (USIA). These programs are designed to promote international understanding by providing developing and industrialized countries with American films, radio programs, television programs, music, books, and cultural programs at low or no cost. These programs, however, have been greatly reduced over the last few years. The USIA-sponsored book publishing program, for example, which includes translation programs and low-priced book programs, was reduced from 6,621,000 copies in 1956 to 525,000 copies in 1980.[53] As a result, many people have criticized the U.S. Government for failing to meet the Third World's cultural and educational needs. One former U.S. ambassador, for example, asserted that the U.S. Government's recent neglect of its overseas book, educational, and cultural programs denies our foreign policy "one of our greatest sources of strength as a nation."[54] Another U.S. diplomat pointed out that other industrialized nations, such as France, the United Kingdom, and West Germany, devote a greater proportion of their national budgets to public distribution of information products for diplomatic purposes than does the United States."

The United States has several options for addressing the political issues raised by new technologies. If the United States wishes to address the informational needs of developing countries, for example, it might increase USIA information distribution programs, and include provisions for the distribution of information in other international development programs for education, agriculture, medicine, transportation, etc. Moreover, USIA might implement new programs to help nations to develop information and communication infrastructures, so they can utilize information in electronic forms such as databases, videotapes, and software programs:

> Information access is easier to transfer to the developing world than was agriculture or industrial know-how. While it is not possible to put the Third World on an equal footing with the First World in the next ten years, it is possible to communicate the needed expertise now. The best mathematicians in the world could create expert systems and make them available to the poorest countries through existing satellite networks and earth stations, relayed by telephones to low-cost terminals. Medical diagnosis and training or engineering design could also be redistributed throughout the world at a unit cost within national budgets.[56]

Another option that the United States might pursue would be to earmark funds that were traditionally allocated for foreign aid for the purchase of intellectual property products. This would give developing countries access to information and information-based products and services and at the same time instill re-

[53]Curtis Benjamin, *U.S. Books Abroad: Neglected Ambassadors* (Washington, DC: Library of Congress, 1984), p. 91.

[54]"Selling America in the Marketplace of Ideas," New *York Times Magazine,* Mar. 20, 1983.

[55]Allen Hansen, Jr., *USIA Public* Diplomacy *in the Computer Age (New* York: Praeger Press, 1984).

[56]Jerome Glenn, "Helping Countries Help Themselves: Keys to Third World Development," *The Futurist,* December 1985, pp. 33-35.

spect for the protection of intellectual property rights.

Although these options address the growing political issues relating to intellectual property rights, they might also conflict with U.S. trade and economic views of intellectual property. For if the United States contributes many of its information-based products and services to developing countries, it cannot receive the international market value of such highly sought after products and services. This, in turn, could have a negative effect on the U.S. balance of payments.

Emergence of New Information-Based Products and Services That Do Not Correspond to Traditional Intellectual Property Protections

Although rooted in different philosophical traditions, the intellectual property systems of different nations have been harmonized over the years through the international intellectual property system. This cooperation, made possible by a shared set of goals as well as by national treatment, led in the past to general agreement among nations on what constituted protectable subject matter, infringement activity, and the like. This process of reaching international agreement is generally slow, depending on years of interplay between national and international laws and policies.[57]

The unprecedented rapid and large-scale development of new information and information-based technologies, which is illustrated in figure 8-3, has disrupted this formerly stable system. Such rapid and large-scale technological change has forced nations to respond faster and perhaps more dramatically in interpreting and legislating intellectual property protection. Some nations have enacted intellectual property legislation to protect emerging technologies, while other nations have not. These divergent reactions have led to great inconsistencies among nations, which, in turn, have made agreement at the international level more difficult.

Intellectual property protection for computer software is one often-cited example of the differing levels of protection nations have granted a new technology:

> The debate on both the possibilities and appropriate form for protection of software has now been continuing for nigh on 15 years. . . . Despite the harmonization of national legislation . . . we are still faced with a whole gamut of divergent solutions ranging from the full recognition of the patentability of software and its protection under copyright, through various intermediary solutions, to a radical refusal of any protection for computer software.[58]

Because the United States was one of the first countries where computer software became a large and important market, it was here that the debate over its protection first took place.[59] Like many other industrialized nations, the United States explored the possibilities of protecting software by drawing analogies between the characteristics of software and other intellectual properties that are protected by existing legal frameworks, such as copyright, patent, and trade secrets. After many heated debates and commissioned studies, the United States, in a 1980 amendment to the 1976 Copyright Act, explicitly granted copyright protection for software.[60]

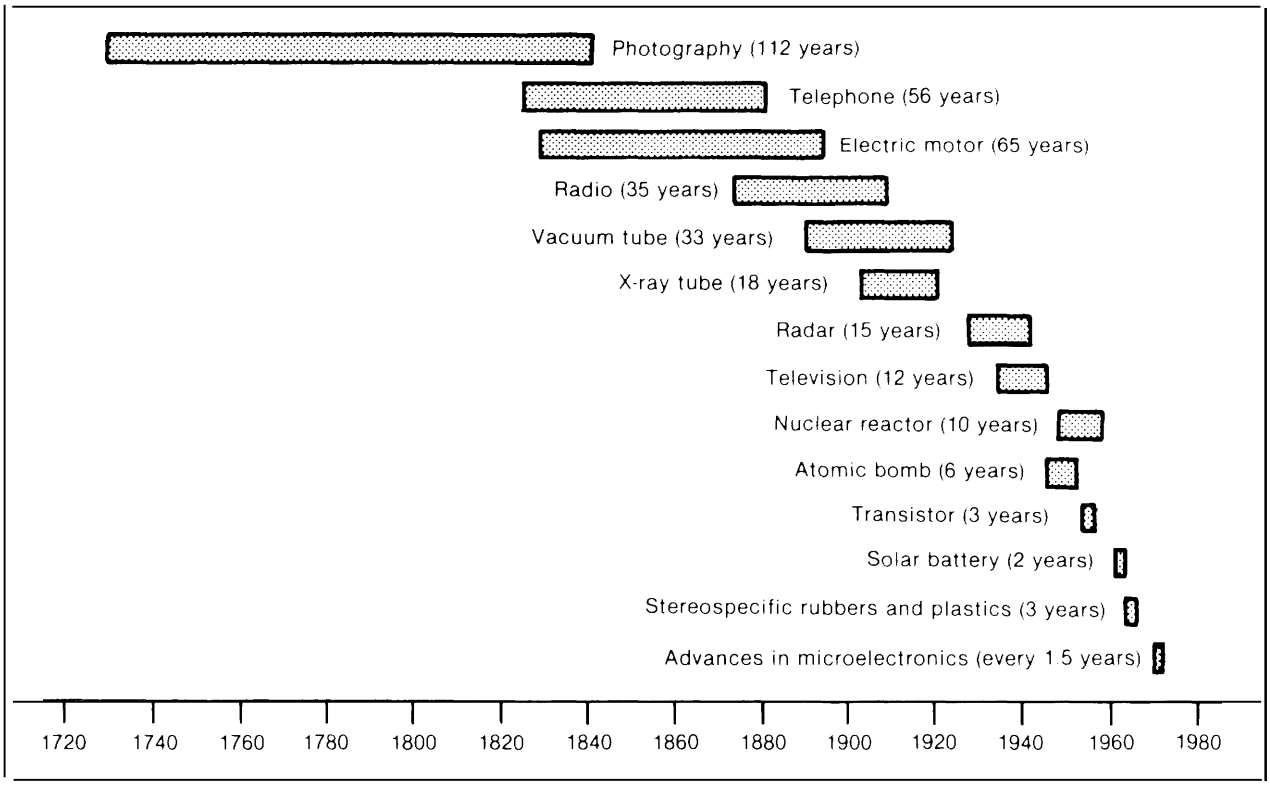
[57] This slow and elastic process of unifying national intellectual property law and policies is cited as one of the most important aspects of the international intellectual property conventions.

[58] Kolle, "Computer Software Protection–Present Situation and Future Prospects, *Copyright* 13, 1977, p. 70.

"In 1982, the worldwide revenues from software amounted to $13 billion and is projected to quadruple by 1987. U.S. companies garner approximately 70 percent of the market. United States Trade Representative, "USTR Seminar on International Copyright Issues in Computer Software, " Sept. 24, 1984.

[60] The United States implicitly extended copyright protection to computer software in the Copyright Act of 1976, 17 U.S.C. §§ 101-810. The National Commission on New Technological Uses of Copyrighted Works (CONTU), created by Congress to revise comprehensively the copyright laws of the United States, stated in its final report that "it is clear that. . . those who have administered the portions of the 1909 act concur in the position that programs are copyrightable. The Copyright Act was amended in 1980 to expressly state that computer programs were to be included as copyrightable works: Section 101 of the Act was amended by addition of the word "computer program, " and a definition of that term; Section 117 was amended by the addition of certain limitations on exclusive rights pertaining specifically to computer programs. The U.S. courts have also recognized copyright protection for software.

Figure 8-3.—The Speed of Change: Intervals Between Discovery and Application in Physical Science



SOURCE John McHale, *World* Facts *and Trends (New* York Collier Books, 1972) p 3, as cited in Magda Cordell McHale *Facts* and Trends *The Changing Information Environment: An Information Chartbook* (Rome Intergovernmental Bureau for Informatics 1985) p 4

Although most nations have not explicitly amended their copyright laws to include software, some either consider it to be protectable under copyright law through judicial interpretation and/or are actively pursuing copyright protection.[61] These countries include Austria, Canada, Colombia, France, Finland, the Federal Republic of Germany, Italy, India, Japan, Korea, Mexico, the Netherlands, South Africa, Spain, Sweden, and the United Kingdom."

Among those nations that are considering protection for software, there is a wide variety of schemes envisioned. Some nations would offer such protection, but with limitations. A white paper prepared for the Canadian Government, for example, proposes to limit copyright protection for object code (machine-readable language) to 5 years.[63] Other nations have declared that they will not protect software under the copyright law, although they may grant it some type of sui generis protection. Other nations may not protect software at all. Brazil, for example, is considering legislation that would establish a sui generis form of protection that would require compulsory licensing of software to Brazilian companies and compulsory registration of both source and

[61] 'Currently-, Australia, Hungary, the Philippines, and Taiwan have amended their copyright laws to include computer software as protectable subject matter.

[62] United Nations Educational, Scientific, and Cultural Organization (UN F; SC()), World Intellectual Property Organization (WI PO), Group of Experts on the Copyright Aspects of the Protection of Computer Programs, Michael S. Keplinger, "A Survey and Analysis of National Legislation and Case Law, March 1985; and Michael S. Keplinger, "Authorship in the Information Age: Protection for Computer Programs Under the Berne and the Universal Copyright Conventions, *Copyright,* March 1985, pp, 119-128.

[63] Consumer and Corporate Affairs and Department of Communications, Government of Canada, "From Gutenburg to Telidon: A Guide to Canada's Copyright Revision Proposals" (Ottawa: Ministry of Supply and Services, 1984).

object codes. The proposed protection, moreover, would be for a very short duration. Such varied approaches to protecting—or not protecting—software and other rapidly changing technologies might impede attempts to reach an international agreement on software protection.[64]

The introduction of reprographic technologies offers another example of how new technology is complicating the harmonization of national intellectual property law at the international level. The increasing use of these technologies has undermined owners' rights to collect remuneration for the reproduction of their works. To cope with these problems, many nations have legislated new rights enabling creators to collect compensation for the use of their works. The Federal Republic of Germany, for instance, has dealt with the problem by amending its copyright law to include a compulsory license that allows authors to collect equitable remuneration for the commercial reproduction of their works. In contrast, France has introduced a tax on the sale and importation of all reprographic copying machines in its 1976 Finance Act. Part of the collected revenues from the tax are paid to the copyright owners. This law applies only to French copyright holders, even though France is a member of both international copyright conventions.

Although both of these solutions aim to ensure rights owners remuneration, they are legally inconsistent with one another, and thus will cause difficulty for international agreement. The West German compulsory license, although under the rubric of copyright law, would be incompatible with the solution enacted by the French. The more serious difficulty, however, arises with solutions like that adopted by France. Because the right to compensation is introduced under legislation outside of the copyright law, the principle of national treatment, on which the entire international intellectual property system is built, is seriously undermined.[65] The principle of national treatment is challenged because the compensation for the reproduction right does not arise from a copyright, and thus foreigners cannot collect compensation for use of their works. In general:

> If that device is generally used by governments when dealing with the new uses of copyright material arising from new technology and new means of communication, the fundamental principle of national treatment and with it the [international] copyright conventions based on it, could be seriously eroded in the near future.[66]

Another problematic situation arises from applying patent law to activities in outer space. Domestically, the National Aeronautics and Space Administration (NASA) has adopted a

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"The fact that WIPO's 1978 proposed draft Treaty for the Protection of Computer Software (which includes rules for the minimum protection of software that are closely related to those of copyright and unfair competition) has not been ratified illustrates the problems of finding an adequate protection for software that can be agreed on internationally. The draft Treaty proposed that in view of the large degree of uncertainty generally related to the existence and form of protection under copyright, that a special system of protection of software similar to copyright should be set up at national and international levels. The draft Treaty, moreover, calls for the international deposit of software. Some individuals believe, however, that Article II of the Berne Convention is applicable for the international protection of software. Cynthia L. Mellema, "Copyright Protection for Computer Software: An International View, *Syracuse Journal of International Law and Commerce*, vol. 11, summer 1984, p. 90.

"Another example of how a right to remuneration has been taken out of the copyright sphere can be seen in the rights many countries have granted to enable creators to receive remuneration from home taping activities. In the case of home taping, a levy on recording equipment or blank tape can be treated as royalty to be divided among copyright holders as in West Germany or Austria. However, it can also be treated largely as a tax, as in Sweden, where 90 percent goes to public funds and 10 percent goes to the rights owners (authors, performers, and phonogram producers). Public lending rights (although an indirect response to the introduction of reprographic technologies), which entitle authors of literary works to receive a royalty when their books are borrowed from a library, have also caused difficulties for international harmonization. For example, in the Federal Republic of Germany this right is granted in their copyright law, and therefore as the Federal Republic of Germany is a member of both the Berne and UCC Conventions, foreigners are entitled to remuneration if their books are borrowed. The Scandinavian countries and the United Kingdom, however, which also grant a public lending right, have chosen to do so by separate legislation outside of the copyright laws and therefore are not bound to grant the right to foreigners; although like the Federal Republic of Germany, they are also members of both conventions, Stephen Stewart, *The Law of International Copyright and Neighboring Rights* (London: Butterworth & Co. (Publishers) Ltd., 1983), pp. 42-43, 282.

'Ibid., p. 43.

clear policy of providing maximum protection for intellectual property rights to encourage the *use* of and commercialization of NASA-supported and developed technology. However, as more research, particularly international cooperative research, is performed in space, it may become more difficult to determine which national legal jurisdiction of patent protection applies to it. For example, sections 102 and 104 of the U.S. Code 35 state that the factors used to determine patentability under U.S. law or to establish priority in international conflicting claims to invention include where an invention was conceived, reduced to practice, or used. In addition, under the U.S. patent law patents protect *use* or manufacture only in the United States. As more U.S. and international research and development is performed in space, the question arises, therefore, as to how to obtain and enforce U.S. patent rights in space.[67]

Policy Implications

The speed and scale of technological change, now and in the future, together with the rapid development of national and international law, are likely to heighten the pressures for the development of international intellectual property law.[68] As technological change prompts more need for rapid international consensus, greater international action and coordination will become necessary. Consequently, the United States might have to participate to the fullest possible extent in international intellectual property fora so that it can both influence international decisions and keep abreast of national and international developments. The United States, moreover, might need to take greater account of how its domestic intellectual property legislation could affect or be affected by the international system.

As discussed above, the extent of U.S. participation in international intellectual property organizations is relatively limited because of its withdrawal from UNESCO and its abstinence from the Berne Convention. This lack of participation might seriously impede the United States from monitoring developments in international agreements. Moreover, it may also weaken the U.S. ability to influence decisions about which rights might be incorporated into the international agreements with respect to new technologies.

In addition to its lack of international participation, recently proposed and already legislated U.S. intellectual property policies might be inconsistent with international intellectual property norms. The recent passage of the Semiconductor Chip Protection Act of 1984 (Public Law 98-620), for example, created a sui generis protection for semiconductor chips. Although this new type of protection maybe well suited for the functional nature of chips, there is a trade-off with respect to its consistency with the system of international agreements. Because the Semiconductor Chip Protection Act of 1984 is a sui generis approach and does not fall under the rubric of copyright or patent law, there is no international agreement under which the protection of chips can be organized at the international level. Moreover, section 902 of the act states that foreigners may only receive protection if their nation also protects mask works. This reciprocity clause is inconsistent with the principle of national treatment which requires all nations to provide foreigners with the same protection as their citizens. Exacerbating these problems, some nations, such as the United Kingdom, disagree with the sui generis approach, considering chips to be protected under copyright

[67] "The Applicability of U.S. Patent Laws in Outer Space," *Telecom Highlights*, June 19, 1985, p. 4; and Barbara Luxenberg (Special Assistant to the Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Department of Commerce), "Protection Intellectual Property in Space: Policy Options and Implications for the United States," presented to the Georgia Institute of Technology Conference, 1985, International Space Policy: Options for the Twentieth Century and Beyond, May 16, 1985.

[68] After approximately a century without any major copyright reform, the reform of national copyright laws to adjust the law to advancing technology has speeded up considerably in the last three decades. For example, new copyright acts passed in France in 1957, the United Kingdom, 1956; India, 1957; the Scandinavian countries, 1959/1960; Germany 1965; Australia, 1968; Japan, 1971; the Soviet Union, 1973; and the United States, 1976; and many Latin American countries, 1970s are evidence of this trend. Stephen Stewart, *The International Law of Copyright and Neighboring Rights* (London: Butterworth & Co. (Publishers) Ltd., 1983), p. 281.

law.[69] To date, only one other nation, Japan, has legislated a sui generis protection for semiconductor chips.

The International Software Protection Act of 1985 (S. 339, 99th Congress) is another example of a proposed policy that might cause problems for the present system. This bill would amend the U.S. copyright law to protect a foreign nation's computer software only to the extent that such a nation protects software-the so-called "rule of the shorter term. " It also stipulates that, if a nation protects software for a period of less than 25 years, the U.S. will suspend all protection for that nation's software. Like the reciprocity clause of the Semiconductor Chip Protection Act, this conflicts with the principles of national treatment called for in the international intellectual property agreements.

The recently proposed renewal of the manufacturing clause also illustrates how a U.S. intellectual property policy might negatively effect U.S. international intellectual property relations. First introduced in the 1891 Copyright Act, this clause required that literary works be printed in the United States in order to enjoy U.S. copyright protection. The general purpose of the manufacturing clause was to protect those who feared that granting unrestricted copyright protection to foreign (specifically British) authors would enable foreign publishers to dominate the U.S. book market. Recognized by many as a type of "xenophobic trade barrier" the manufacturing clause has been weakened over time, and most recently was set to expire in July 1986 (Public Law 97-215).[70] However, Congress is currently considering legislation that would extend the manufacturing clause or make it permanent (S. 1938, S. 1822, H.R. 3465, H.R. 3890, 99th Congress).

The manufacturing clause has created several difficulties for U.S. international intellectual property relations. Because it imposes formalities (the requirement of U.S. publication) on works of foreign origin, it impedes U.S. adherence to the Berne Convention. For to join the Berne Convention, member nations cannot impose formalities as a condition of copyright. The manufacturing clause has also been the subject of complaints of unfair trade practices by the European Economic Community (EEC), and found to be an import restraint that is inconsistent with Article XI of the General Agreement on Tariffs and Trade (GATT) .7' Because it restricts the protection of foreign works and precludes the United States from ratifying the Berne Convention, this clause might also lead other nations to believe that the United States is disingenuous in its attempts to convince other nations to ratify international intellectual property conventions.

If the United States proceeds with policies that are incompatible with either international agreements or other nations' domestic laws and practices, it might jeopardize its ability to incite other nations to protect U.S. intellectual property products. For unlike many other items of international trade, the financial returns from intellectual property products are largely dependent on other nations' laws and enforcement actions. Therefore, the United States must ensure other nations' cooperation and support for the international protection of intellectual property rights. A coercive approach or the imposition of U.S. policies on other nations might not necessarily serve to elicit other nations support for the international protection of intellectual property, as one copyright analyst points out:

> Of course it would be pure folly to expect all nations of the world, including the new ones, to introduce at the present stage the same copyright regime as we and other well-endowed old-timers are-or, in the case of the Soviet Union, should be–willing to accept. We should recall that in 1891 that this country, claiming to be a have-not, provided no legal protection whatever for the published works of foreigners. When our legislation of 1891 finally did grant rights to such works,

[69] R. Hart, "Legally Protecting Semiconductor Chips in the UK, " *European Intellectual Property Review*, vol. 9, 1985, pp. 258-263.

[70] Benjamin Kaplan, *An Unhurried View of Copyright (New* York: Columbia University Press, 1967), p. 124.

[71] Ralph Oman, Register of Copyrights, Library of Congress, testimony on "Bills To Make Permanent the Manufacturing Clause of the Copyright Act, " before the Subcommittee on Patents, Copyrights, and Trademarks, Senate Committee on Judiciary, Jan. 21, 1986, p. 7.

it was on the condition, in the case of books among certain other productions, that manufacture be carried out in the United States .... But I have brought in the manufacturing clause to suggest by example that harmonization is bound to have its difficulties and, beyond that, to propose that we [the United States] ourselves should take another step toward international pacification.[72]

Ratifying the Berne Convention and rejoining UNESCO are possible to options to bring U.S. law into line with international intellectual property law. As previously discussed, these options would have both positive and negative effects on the U.S. position in the international intellectual property system.

Another option to address the legal issues raised by new technologies would be to establish a critical review of how proposed legislation would affect and be affected by the international system; accordingly, legislation might be modified to that effect. However, similar to the negative outcomes associated with joining the Berne Convention, conforming U.S. laws and practices to international intellectual property norms might threaten the integrity of traditional U.S. intellectual property laws and practices.

Increasing Difficulty of Enforcing Intellectual Property Rights Caused by Emerging Information and Communication Technologies

Traditionally, nations granted intellectual property rights on the assumption that they could, in fact, be enforced. In the past, this was true; copyright holders could more easily collect for uses and detect infringements of their works. This was the case because uses of creative works were easily monitored, and infringements easily detectable, and because the geographic scope of use was generally confined within national boundaries.

While facilitating the international exchange of intellectual property, new communication and information technologies have also undermined the traditional ways of enforcing intellectual property rights. The same technological advances contributing to economic growth, trade, and international access have also made it easy and inexpensive to reproduce and pirate intellectual property .73 Moreover, these technologies, such as satellites, cable, photocopying, recording audio and video devices, computers, and electronic storage, retrieval, and distribution systems, are more powerful than their predecessors, engendering problems of enforcement that are much larger and more international in scope.

The level of legal protection for intellectual property in many nations also contributes to international piracy of U.S. copyrighted works. The problems U.S. copyright owners face abroad with respect to these conditions can be classified into three categories:

1. nonexistent (ineligibility) copyright protection in a foreign country;
2. inadequate protection in a foreign country; and
3. ineffective copyright protection in a foreign country .[74]

The growing problem of international enforcement is exemplified in the apparent rapid increase of international piracy of protected works. Many U.S. industries have reported large losses due to foreign private copying, commercial piracy, and counterfeiting of their intellectual property products.[75] The U.S. In-

[72] Benjamin Kaplan, *"An Unhurried View of Copyright (New* York: Columbia University Press, 1967), pp. 123-124.

[74] International Intellectual Property Alliance, "International Intellectual Property Alliance: U.S. Government Trade Policy: Views of the Copyright Industries, 1985, p. 10.

[75] Subcommittee on Patents, Copyrights, and Trademarks, Senate committee on the Judiciary, "Oversight on International Copyrights: How To Protect the Nation's Creativity by Protecting the Value of the Intellectual Property, " Sept. 25, 1985, p. 86.

"Although piracy and counterfeiting each constitute theft of intellectual property, there are small differences in their meaning. In addition, private copying, which is not clearly defined as a legal or an illegal practice under most nations' laws, also has a potential impact on the sales of intellectual property products. Piracy refers to unauthorized reproduction for commercial gain of literary, musical, artistic, and other copyright works. Because pirates do not pay royalties and bear no development costs, they can easily sell their products more cheaply than the

(continued on next page)

ternational Trade Commission estimates U.S. domestic and foreign sales losses due to patent and copyright infringements at between $6 billion and $8 billion per year.[76] Figure 8-4 shows the level of infringing activities and some frequently counterfeited products. The International Anti-Counterfeiting Coalition and the U.S. Customs Service place losses due to the infringement of intellectual property rights closer to $20 billion annually .[77] Another survey undertaken by the International Intellectual Property Alliance of the losses due to piracy of U.S. copyrighted records and tapes, motion pictures, and books in 10 selected nations estimates annual losses at $1.3 billion (see table 8-3). A poll of the motion picture and television, prerecorded entertainment, and publishing and advertising industries also revealed that 100 percent of the executives surveyed cited intellectual property rights infringements abroad as a major barrier to sales of their products in international markets[78] (see table 8-4).

Although these estimates provide a general approximation of the extent of the piracy problem, there are relatively few data on specific industries in individual countries and on the actual amounts of revenue lost due to private copying, commercial piracy, and counterfeiting. Evidence of private copying and piracy is generally gathered indirectly: by measuring the increase of sales and availability of hardware that permits easy and inexpensive copying; the increase of sales of blank audio and video tapes; the decreasing sales of published, audio, and video works; the decreasing number of journal subscriptions in different countries; the widespread availability of unauthorized copies of American creative works; or the level of ineffectiveness or inadequacy of protection offered in different countries. These measurements, however, do not directly indicate what percentage of the purported piracy is of U.S. products. In other instances, when overall estimates of revenues lost to piracy are presented, the methodology or definitions of harm used to extrapolate such figures are often inconsistent throughout the calculations or are not readily apparent. For example, much of the survey data on the effects of unauthorized copying on producers must be carefully interpreted in light of the way in which harm is defined:

> Two possible definitions [of harm] are suggested. Under the first, harm is measured by the reduction in profits of the producer below their level prior to a new unauthorized use. Under this definition, harm does not occur if the unauthorized use leaves profits from all previous uses unaffected. . . Under a second definition, harm occurs if the new use reduces profits below the level they would have reached had the producer been able to exploit the market served without authorization. . . Clearly, these alternative definitions can give very different answers to the question of whether an unauthorized use has harmed the property owner. The distinction between them must be kept in mind when examining the various claims of harm.[79]

The definitions of piracy also vary greatly from nation to nation, and they are generally dependent on each country's intellectual property laws and on international norms. It would seem, therefore, that because American products garner a relatively large percentage of foreign markets, foreign piracy of U.S. intellec-

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rights owners. Counterfeiting refers to unauthorized duplication of a product's trademark to give a similar appearance of a specific product. In addition to directly undercutting the original rights owner's market, counterfeiters by producing lower quality imitations of products may also damage the products quality reputation and further undercut the original market. Although not illegal, private copying generally refers to home copying of intellectual property products solely for individual consumption. It has resulted from the ready availability to the consumer from 1964 onwards of magnetic tape reproduction equipment coupled with blank cassettes, videotape recorders coupled with blank cassettes, personal computers coupled with blank software, etc. See Gillian Davies Private *Copying of Sound and Audiovisual Recordings* (Oxford: ESC Publishing Limited), 1984.

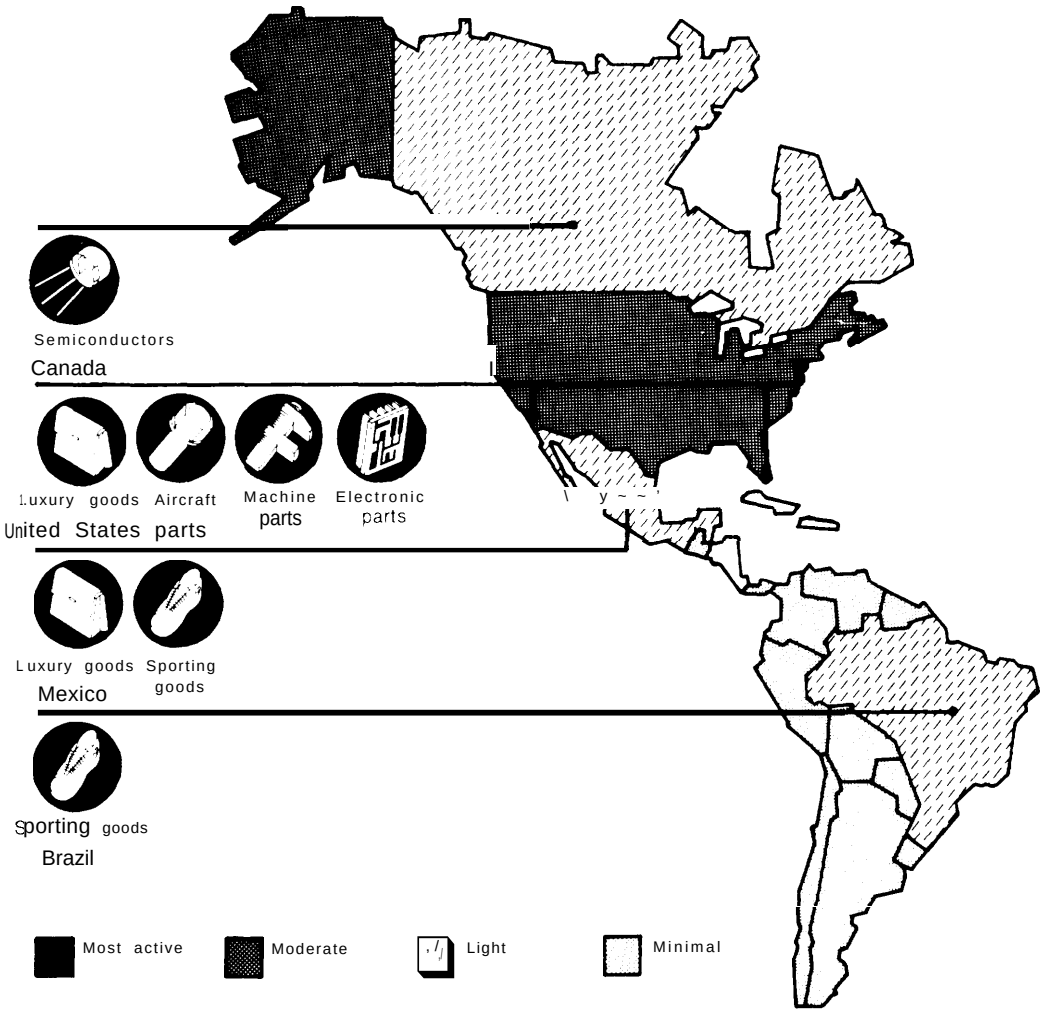
[76] "U.S. International Trade Commission, "The Effects of Foreign Product Counterfeiting on U.S. Industry" (Washington, DC: U.S. International Trade Commission, January 1984).

[77] "Eileen Hill, "Intellectual Property Rights: Commerce Department Program Seeks Greater Protection for U.S. Intellectual Property Rights, " *Business America,* Mar. 18, 1985, p. 4.

[78] CBS, Inc., "Trade Barriers to U.S. Motion Picture and Television, Prerecorded Entertainment, Publishing and Advertising Industries, " September 1984, p. iii.

[79] "Stanley Besen, "Economic Issues Relating to New Technologies and Intellectual Property, " contract prepared for OTA, December 1984, pp. 45-55.

Figure 8-4.—The Level and Location of International Counterfeit Activity of U.S. Products



SOURCE International Trade Commission. as cited in Business Week, Dec. 16, 1985

tual property products is also sizable. These uncertainties notwithstanding, the major available statistics on piracy and counterfeiting in the publishing, recording, motion picture, and software industries are summarized below.

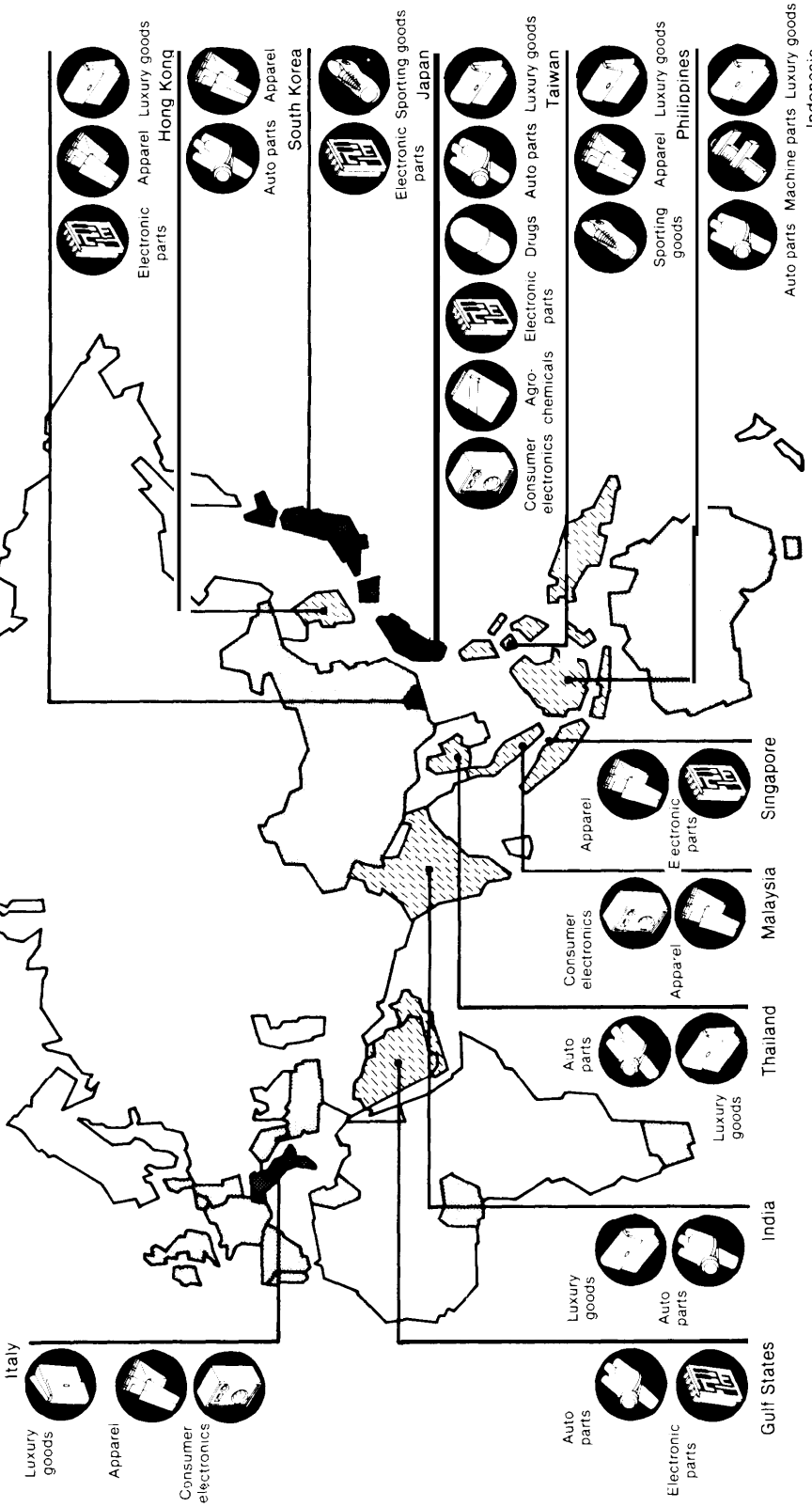
The Publishing Industry

According to publishing industry officials, the introduction of technologies such as photocopying, and new electronic storage and print technologies has led to vast international piracy and private copying of texts and literary works.[80] Compounding this is the marriage of communication technologies with electronic information storage and retrieval systems, which has led to more and faster international

[80] Literary works are defined in § 101 of the 1976 Copyright Act as ". . . works other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied."

Internationally, literary works are protected under the UCC of which the United States is a member: "Each Contracting State undertakes to provide adequate and effective protection of the rights of authors and other copyright proprietors in literary, scientific, and artistic works, including writings, musical, dramatic, cinematographic works, and paintings, engravings, and sculpture. Article I, Universal Copyright Convention, Paris, 1971. Literary works enjoy a higher international level of minimum protection under the Berne Convention of which the United States is not a member.

Figure 8-4.—The Level and Location of International Counterfeit Activity of U.S. Products (continued)



SOURCE: International Trade Commission, as cited in Business Week, Dec. 16, 1985.

Table 8-3.—Estimated Losses From Piracy in Ten Selected Countries[a]
(dollars in millions)

	Records/ tapes	Motion pictures	Books	Software[b]	Total
Singapore	220[c]	11	107[c]	20	358[c]
Taiwan	9	25	118[d]	34	186[d]
Indonesia	180[e]	17	6	3	206[e]
Korea	40	16	70	20	146
Philippines	4	19	70	4	97
Malaysia	33	13	20	7	73
Thailand	13	12	7	2	34
Brazil	19	13	8	35	75
Egypt	5	5	10	3	23
Nigeria	120	—[f]	11	—[f]	131
Total	643	131	427	128	1,329[g]

[a]Estimated losses reflect sale of pirated works in the domestic economy, except for Singapore, Taiwan, and Indonesia where the figures include losses resulting from export of pirated works.
[b]While exports of software are known to occur from some countries, we have been unable to estimate such losses; these figures reflect domestic piracy only.
[c]Records/tapes: domestic $50 and export $170; Books: domestic $7 and export $100; Total: domestic $88 and export $270.
[d]Books: domestic $8 and export $110; Total: domestic $76 and export $110.
[e]Records/tapes: domestic $80 and export $100; Total: domestic $106 and export $100.
[f]Because there are no available data on VCR penetration in Nigeria, it is not possible to estimate losses. No estimate is available for software piracy.
[g]Domestic $849 and export $480.

SOURCE: International Intellectual Property Alliance, "Piracy of U.S. Copyrighted Works in Ten Selected Countries: A Report by the International Intellectual Property Alliance to the United States Trade Representative," 1985, p. ii.

exchanges of printed works, The third factor contributing to piracy is the lack of adequate, effective, or indeed, any legal protection for U.S. literary works in many nations.

The Association of American Publishers, Inc. (AAP) estimates that the industry loses $1 billion each year to piracy of English-language books worldwide. Of this, AAP estimates that U.S. works account for 70 percent. The AAP also suggests that estimates of lost revenues would be greater if calculated on the basis of U.S. legitimate prices instead of on the basis of estimated revenues earned by pirates. The publishing industry has also completed a country-by-country analysis of the piracy of published or literary works." Although the AAP does not calculate direct evidence of actual harm to the industry, its report indicates that piracy is more common in some nations than in others. The majority of the piracy reported takes place in developing or newly industrializing nations. For example, over 27 U.S. publishers reported evidence of piracy of their materials in Taiwan:

> An estimate of at least 560 titles from reference, professional, trade, personal computer and college textbooks have been pirated in Taiwan with approximately 48,000 pirate copies in English and Chinese. . . [in addition] Taiwan is illegally exporting pirated books to Australia. The books are business and computer-related and are published by well-known American publishers."

In addition to pirating of domestic sales, Taiwan as well as other A SEAN countries pirate products to export to other nations.[83] Approx-

[82] Association of American Publishers, Inc., "Piracy of Copyrighted Material: A Report Prepared at the Request of the U.S. Department of State," 1985.

[83] Ibid., p. 6.

[84] ASEAN (Association of Southeast Asian Nations) countries are Brunei, Indonesia, Malaysia. the Philippines, Singapore, and Thailand.

[85] "In January 1983, the Taiwanese police seized a container bound for Nigeria, purportedly carrying water filter cups and crash helmets. Hidden inside were 54,000 copies of five British titles that had not been authorized by the copyright holders for export from Taiwan. The cargo was valued at $48,000. (Its selling price in Nigeria would have been at least $250,000). After long and expensive litigation the penalty for this offense was 1 year's imprisonment, but the sentence was suspended. The infringing cargo was destroyed, but no printing plates were confiscated and only a small fine was assessed for false declaration. If 20 to 40 such shipments are smuggled out of Taiwanese ports each month, then the export value of these shipments at pirate prices would amount to a figure between $60 million and $120 million per year." Association of American Publishers, Inc., "Detailed Information on Worldwide Piracy of Copyrighted Material and the Copyright Laws and Penalties," June 11, **1985, pp. 19-20.**

Table 8-4.—Countries and Regions That Infringe Copyrights of U.S. Motion Picture and Television, Prerecorded Entertainment, Publishing, and Advertising Industries

	Copyright infringement					Copyright infringement			
	Motion picture and television industries	Prerecorded entertainment industries	Publishing industry	Advertising industry		Motion picture and television industries	Prerecorded entertainment industries	Publishing industry	Advertising industry
Algeria	[ ]	[ ]			Japan	■	[ ]	[ ]	[ ]
Andean Pact	[ ]	■	■		Kenya		[ ]		
Argentina	■	■	■	[ ]	Korea	■	■	■	[ ]
Australia	[ ]	[ ]	■	[1	Lebanon	[ ]	[ ]	[1	
Austria	■	■	■		Malaysia	■	■	■	
Belgium	■	■	■		Mexico	■	■	[1	[ ]
Brazil	■	■	■		Netherlands	■	■	■	[ ]
Canada	■	■	[ ]		New Zealand			■	
Caribbean Region	■	■	■		Nigeria	■	■	■	
Chile	[ ]	■	[ ]		Norway		■		[ ]
Colombia	[ ]	■	■		Pakistan			■	
Denmark		■			People's Republic of China			■	
Dominican Republic			■		Peru	[ ]	■	■	
Eastern Block				11	Philippines	■	■	■	
EEC	■	■	■		Portugal	■	■	■	[ ]
Egypt			■		Saudi Arabia	[ ]	■		
Finland		■	■	[1	Singapore	■	■	■	
France	■	■	■		South Africa	■	■	[	[ ]
Germany, Federal Republic of	■	■	■	[ ]	Spain	■	■	■	
Greece	■	■	■		Sweden	■	■	[1	[ ]
Hong Kong	■	[ ]	■		Switzerland	■	■	■	[ ]
India	■	■	■		Syria	■			
Indonesia	■	■	■		Taiwan	■	■	■	[ ]
Iran	[ ]	[ ]	■	[ ]	Tanzania		[ ]		
Iraq		[ ]		[ ]	Thailand	■	■	■	
Israel	[ ]	[ ]	[ ]		United Kingdom	[ ]	■	■	[ ]
Italy	■	■	■		Venezuela	■	■	■	[ ]
Jamaica	■								

■ -- Primary problem country or region identified by interviewed executive
= Primary problem country or region identified in literature reviewed

SOURCE Columbia Broadcasting Co., Inc, "Trade Barriers to US Motion Pictures and Television, Prerecorded Entertainment, Publishing and Advertising Industries," 1984

imately 16 American publishers reported infringement activity in Korea:

> It is estimated that pirates sell at least $100 million of books annually, and sales are rising each year. Importers' sales are an estimated $5 million to $8 million annually, but are plunging. Foreign book pirating flourishes because it is legal. This country hasn't signed any international copyright convention and local law does not protect copyrights of foreign publishers. Korean publishers can copy books without paying advertising, promotion and other costs-not to mention royalties—that original publishers do pay. They provide books to stores on consignment, making it easy for retailers. They also sell directly from catalogs. One such catalog distributed in Korea, entitled Il Won Books Information, lists over 8,000 pirated books.[84]

Other countries where American publishers have discovered infringements include Argen-

[84] Association of American Publishers, Inc., "Piracy of Copyrighted Material: A Report Prepared attheRequest of the U.S. Department of State," 1984, pp. 2-3.

tina, Australia, Brazil, Chile, China, Colombia, Costa Rica, the Dominican Republic, Ecuador, Egypt, West Germany, Greece, Holland, Hong Kong, India, Indonesia, Iran, Iraq, Jamaica, Japan, Malaysia, Mexico, Nigeria, Pakistan, Panama, Peru, the Philippines, Saudi Arabia, Singapore, Thailand, Venezuela, and the Soviet Union.[85]

The Recording Industry

As in the publishing industry, recording companies report widespread international infringements of sound recordings. The introduction of broadcasting and of less expensive, high-quality duplicating hardware have led to increased international piracy, counterfeiting, and private copying of sound recordings.[86]

Another major contributing factor to this piracy is the lack of adequate or effective protection for U.S. audio works in many countries. Half of the member countries of the United Nations, for example, do not yet recognize the reproduction right in sound recordings. Many of the nations that do not provide adequate protection for U.S. literary works are also those that do not protect U.S. sound recordings.[87]

Because many of the developing and newly industrializing countries do not afford adequate protection for U.S. sound recordings, these countries also are the sites of the majority of piracy and counterfeiting of these works.

> Singapore is an excellent example of the magnitude of the problem, where it is estimated that 70 million counterfeit and pirate sound recordings were exported in 1984. This incredible total, plus an additional 15 million counterfeit units produced in Singapore for internal consumption, accounted for 90 percent of sound recordings manufactured or sold in Singapore last year. A large percentage of the unlawfully duplicated products was U.S. owned. This situation exists despite energetic efforts of the IFPI (International Federation of Phonogram and Videogram Producers) to combat the problem.[88]

Several Latin American countries are also responsible for large numbers of pirated and counterfeited U.S.-owned audio works:

> In Panama, as much as 80 percent of the musical tape market is dominated by counterfeit and pirate goods. In Peru, the percentage of illicit tape recordings is approximately 70 percent. Bolivia and Chile both report that approximately 50 percent of the tape recordings manufactured and sold there are counterfeit or pirate, The huge Mexican market had a 40 percent penetration of counterfeit and pirate tapes in 1982—equaling approximately 11 million units of $30 million in lost sales.[89]

In addition to citing specific problems in different nations, the Recording Industry of America, Inc. (RIA) has reported overall statistics on the extent of foreign piracy and counterfeiting of U.S. sound recordings. The estimated total sales of counterfeit and pirated U.S.-owned sound recordings overseas in 1982 was, according to the RIA, well over $250 million. Based on worldwide market shares for

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"'Association of American Publishers, Inc., "Piracy of Copyrighted Material: A Report Prepared at the Request of the U.S. Department of State, " 1984.

" Under U.S. law sound recordings were first explicitly protected by a 1971 amendment (Public Law 92-140, 85 Stat. 391) and under § 101 of the 1976 Copyright Act are thus defined: "material objects in which sounds, other than those accompanying a motion picture or other audiovisual work, are fixed by any method now known or later developed, and from which the sounds can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.

Internationally, sound recordings are protected under the 1971 Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms of which the United States is a member. The 1961 International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations, better known as the Rome Convention, protects sound recordings internationally, as a neighboring right. The United States, however, is not a member of this Convention.

"-These countries include Argentina, Bolivia, Brazil, Chile, Cyprus, Egypt, Greece, India, Indonesia, Italy, Korea, Kuwait, Lebanon, Malaysia, Mexico, Morocco, Nigeria, the Netherlands, Panama, Peru, Philippines, Portugal, Saudia Arabia, Singapore, Taiwan, Thailand, Tunisia, Turkey, and Venezuela. Statement of the Recording Industry of America, Inc., before the U.S. Department of State International Copyright Panel, "The Piracy of Copyrighted Sound Recordings in Foreign Countries, ' Mar. **22, 1985, pp. 2-8.**

'Statement of the Recording Industry of America, Inc., before the U.S. Department of State International Copyright Panel, "The Piracy of Copyrighted Sound Recordings in Foreign Countries, Mar. 22, 1985, p. 2.

**Statement of the Recording Industry of America, Inc., before the U.S. International Trade Commission, "The Impact of Foreign Product Counterfeiting on the U.S. Recording Industry," Sept. 19, 1983, p. 10.

different nations' music, it is probable that approximately 50 percent of the estimated $515 million in counterfeit and pirate sales outside of the United States in 1982 relates to recordings originally created and owned by U.S. recording companies, performers, lyricists, and composers.[90]

The Motion Picture Industry

Like the publishing and recording industries, the motion picture industry is also experiencing international private copying, piracy, and counterfeiting of U.S.-owned audiovisual works.[91] The Motion Picture Association of America, Inc. estimates, for example, that worldwide losses due to film and video piracy are now approaching $1 billion per year.[92] In addition to the lack of adequate legal protection of audiovisual works in many nations, the major factor leading to international infringements of U.S.-owned audiovisual works is the introduction and increased use of information and communication technologies. Used individually or together, videocassette recorders (VCR), satellites, and cable technologies have been referred to by some analysts as an electronic triad, or the unholy trinity, for copyright holders of motion pictures.[93]

The relatively recent advent of satellite technology has had the greatest impact on international video piracy.[94] Although terrestrial broadcasting has permitted some spillover into other countries of U.S. copyrighted materials, the scope of the satellite footprints is much greater and allows other nations greater unauthorized access to U.S. works.[95] Although technical advances are improving the accuracy of the satellite beams, it will never be possible to shape the beams so precisely that they follow the contours of a given country." Consequently, U.S. satellite signals are poached by owners of earth station receivers or by cable systems, which retransmit them to relatively

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"Statement of the Recording Industry of America, Inc., before the U.S. Department of State International Copyright Panel, "The Piracy of Copyrighted Sound Recordings in Foreign Countries, " Mar. 22, 1985, p. 1, 6.

"Motion pictures and other audiovisual works are a protectable subject matter under the U.S. Copyright Law and were defined under the 1976 Act in § 101 as ". . . works that consist of a series of images which are intrinsically intended to be shown by the use of machines or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the words are embodied. "

Internationally, motion pictures and audiovisual works under Article 1 of the Universal Copyright Convention (1952 and 1971 texts) of which the United States is a member: "Each Contracting State undertakes to provide adequate and effective protection of the rights of authors and other copyright proprietors in literary, scientific and artistic works, including writings, musical, dramatic and cinematographic works, and paintings, engravings and sculpture. " Audiovisual works are also protected internationally under Article 2 of the Berne Convention for Literary and Artistic Works of which the United States is not a member.

"Motion Picture Association of America, Inc., "Film and Video Piracy: Manual for Investigators and Prosecutors, " 1984, p. 3.

'{Edward W. Ploman and L. Clark Hamilton, Copyright: 1n-*tellectual Property in An Information Age* (London: Routledge & Kegan Paul, 1980), p. 153.

The various forms of film and video piracy can be grouped into three main categories: 1) film to tape transfers, 2) duplication of legitimate prerecorded videocassettes and videodisks, and 3) videotaping off television. Additional types of film and video piracy include the unauthorized distribution of film prints, the unauthorized public performance of a legitimately owned film print or videocassette or disk, and the unauthorized interception of subscription TV programming. Motion Picture Association of America, Inc., "Film and Video Piracy: Manual for Investigators and Prosecutors, " 1984, p. 6,

"'Copyrighted programs carried via satellite are protected internationally by the Convention Relating to Distribution of Programme-Carrying Signals Transmitted by Satellite of 1974. On Oct. 12, 1984, the United States ratified this Convention without any amendment to domestic law. Commonly referred to as the Brussels Satellite Convention, it obligates contracting states to take adequate measures to prevent the unauthorized distribution of programming carried by satellite on or from their territories. The Convention leaves each state free to choose its own method of implementation, including designation of the specific beneficiaries of protection. The Convention, however, exempts signals that are intended for direct reception from satellite by the general public; these broadcast satellite signals are generally already regulated under the copyright or neighboring rights regimes of most nations. It also does not apply to individual reception of satellite signals for purposes of private viewing. Because there are currently only nine contracting states to this Convention, the international effectiveness of this treaty remains questionable.

"'Satellite footprints are defined as "the area of the earth's surface in which satellite transmissions can be received. . . Note that a footprint is a fluid concept and not a static one. Its size will depend on the technical characteristics of the receiving dish and environmental conditions. Therefore, a particular satellite transmission will have one footprint when 10-foot earth-based dishes are being used and another one when 3-foot dishes are being used. " Motion Picture Export Association of America, Inc., "MPEAA Memorandum on the Uses of Satellite Technology, " 1984, p. 9.

'Edward W. Ploman and L. Clark Hamilton, Copyright: *Intellectual Property in An Information Age* (London: Routledge & Kegan Paul, 1980), p. 155.

large audiences without compensation to U.S. copyright holders.

Canada, for example, takes advantage of its geographic proximity to the United States and the availability of American satellite signals:

> Canadian cable systems under court decisions have no copyright liability under Canadian law for their stock in trade, their distribution to their paying subscribers of copyrighted works contained in the broadcast signals, both Canadian and American, which they capture from the air.[97]

Piracy of American signals is also a widespread problem in Central America. Costa Rica and the Dominican Republic, for example, pirate large amounts of U.S.-owned programming:

> The most compromising form of piracy in this country [Costa Rica] is the unauthorized retransmission of cable TV signals. These signals carry a wide variety of copyrighted material. Cable Color, a pirate cable system located in the capital city of San Jose, has a subscriber count of approximately 10,000, while a similar cable TV system, Supercanal, transmits to 3,000 subscribers. Television Receive Only (TVRO) dishes as well as unauthorized public performances also present a serious problem to the American motion picture, cable, and television industries.
>
> The theatrical and television markets for feature films and television programming continue to be severely affected by the signal theft practiced by cable TV Dominican and Telecable National. These two pirate cable TV systems cumulatively service 20,000 subscribers in the capital city of Santo Domingo, as well as the second largest Dominican city, Santiago. Television Receive Only dishes can be found in large numbers throughout the city.[98]

Many Caribbean nations are also responsible for pirating U.S. programming by satellite. Jamaica is a prime example:

> As with nearly every other island in the Caribbean, there is wholesale video and signal piracy in Jamaica. . . Many homes and commercial facilities such as hotels have Television Receive Only dishes that intercept satellite signals without authorization. One of these has been operated by the Jamaica Broadcast Company, a government-owned operation that has intercepted motion picture programming and rebroadcast it to the entire island without charge. The impact of such practices is self-evident.[99]

In many countries, the widespread consumer use of videocassette recorders has joined inadequate or ineffective legal protection in promoting increased piracy of American audiovisual works. These pirated copies are, in turn, sometimes rebroadcast on cable or local broadcasts. Many of the countries where piracy of literary and musical works is rampant also are responsible for widespread video piracy.

Several ASEAN countries, for instance, are major centers of piracy of U.S. audiovisual works. In addition to pirating for domestic sales, many of these nations export large amounts of pirated and/or counterfeited copies. Both Korea and Indonesia are well known for these activities:

> Due to the absence of adequate and effective copyright legislation in relation to foreign works, the videocassette piracy problem in Korea is serious. Pirated copies of American films are widely available and service a 550,000 VCR population in South Korea. Many of these are reputed to come from U.S. military bases in the country. Some hotels are using videocassettes for in-house entertainment without licensing agreement, and there is unauthorized use of American films by broadcast television stations. . . .
>
> In a country with 600,000 videocassette recorders, the piracy of American motion pictures is 100 percent. This is due to the absence of adequate and effective copyright legislation which, in turn, inhibits legitimate market entry. 'no

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[97] CBS, Inc., "Statement of CBS Inc. Before the Canadian Parliamentary Standing Committee cm Communications and Culture, " April 1985, pp. 1-2.

"Motion Picture Association of America, Inc., "Brief Description of Film Piracy, for U.S. Department of State International Copyright Panel, Mar. 22, 1985, pp. 1-2.

Motion Picture Association of America, Inc., "Brief Description of Film Piracy, for U.S. Department of State International Cop}' right Panel, Mar. 22, 1985, p. 3.1

[99] "'Motion Picture Association of America, Inc., "Brief Description of Film Piracy,'' for U. S. Department of State International Copyright Panel, Mar. 22, 198.5, p. 3.

Other countries where video piracy occurs include Brazil, Canada, Costa Rica, Cyprus, the Dominican Republic, Egypt, France, Hong Kong, Indonesia, Israel, Italy, Jamaica, Korea, Malaysia, Mexico, the Netherlands, Nigeria, Pakistan, Panama, Peru, the Philippines, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Taiwan, Thailand, Turkey, United Kingdom, Venezuela, and West Germany.[101]

The Software Industry

Because few major studies of the problem have been undertaken, there are few data on the extent of foreign piracy of U.S. software products. [102] This is so largely because software is a relatively new industry, and also because microcomputers are much less widely used abroad than in the United States. [103] Recently, however, the International Intellectual Property Alliance undertook a major study on the extent of international piracy of U.S. software products. This study found that the U.S. software industry is losing significant annual sales because of copyright violations in Brazil ($35 million), Egypt ($3 million), Korea ($20 million), Malaysia ($7 million), the Philippines ($4 million), Singapore ($20 million), Taiwan ($34 million), and Thailand ($2 million).[104]

Given the precedent of foreign piracy of other U.S. intellectual property products and the expected growth of foreign demand for computers and computer products, the piracy of software abroad may soon become a larger concern to U.S. software manufacturers. Consequently, over the long term more in-depth analysis and documentation can be expected. With such information, U.S. software manufacturers might more effectively deter international piracy.

Policy Implications

Although these statistics can only measure the harm from private copying and piracy indirectly, they make it clear that piracy is a more serious problem at the international level than at the domestic level. Because of the increasing importance of information-based products and services to the U.S. economy and international trade, deterring foreign piracy of U.S. intellectual property products will most likely become a high priority for the United States. As new technological developments erode traditional enforcement mechanisms and permit greater international dissemination of such products, the United States will need to seek to improve enforcement of U.S. intellectual property rights abroad. Moreover, given the inadequacy of enforcement abroad, the United States might want to pursue ways of ensuring that countries strengthen their legal protection and enforcement mechanisms for both foreign and domestic works.

Currently, the United States is taking some action to ensure adequate protection. It is, as previously discussed, using the granting of trade preferences as an incentive for the establishment of legal protection and increased enforcement efforts to protect intellectual property products. Moreover, the United States has begun a series of bilateral discussions with other nations concerning international enforce ment. These include discussions with Japan on the protection of software under Japanese copyright law; discussions with Canada on the issue of protecting cable retransmissions of U.S. broadcast programming; and discussions with Caribbean nations on the unauthorized interception and retransmission of U.S. satellite-transmitted motion pictures and other programming. These meetings have proved

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[101] Elizabeth Greenspan, "Film and Video Piracy," *International Media Law, 1983.*

[102] Published anecdotal evidence of foreign software piracy is also rare. Some examples, however, have been cited by the AAP: "Pirated software [in Taiwan] is sold for 1 percent of the U.S. list price, or $3.50 for a best-selling U.S. software product like VISICALC or WordStar or others that sell for approximately $350 in the United States. Often the pirate gives away 5 or 10 pieces of software with a Pineapple (or pirated Apple) computer. Pirated computer books may also be included in this package." Other countries where software piracy occurs include Brazil, Greece, Korea, and Singapore. Association of American Publishers, "Piracy of Copyrighted Material," a Report Prepared at the Request of U.S. Department of State," Mar. 22, 1985.

[103] The Software Publishers Association informally estimates that for every legitimate copy of U.S. software abroad there are approximately 5 to 10 pirated copies, telephone conversation, July 8, 1985.

[104] International Intellectual Property Alliance, "Piracy of U.S. Copyrighted Works in Ten Selected Countries: A Report by the International Intellectual Property Alliance to the United States Trade Representatives," August 1985.

successful: Japan has decided to protect software under copyright; Canada is considering the copyright status of cable retransmissions; and the Jamaican broadcasting authorities are beginning negotiations.[105]

The United States is also initiating educational seminars on intellectual property rights for industry and government representatives, local attorneys, and educators of developing countries. In early 1985, for example, U.S. delegations from the Copyright Office, the Patent and Trademark Office, and the Department of State went to Indonesia, Malaysia, and Thailand to present lectures on crucial international intellectual property legal issues and the need to provide adequate and effective laws and enforcement mechanisms to deter infringement. These have been particularly useful because each of these nations is considering revisions to its copyright laws and is examining how to best protect new technologies, such as computer software.[106] In addition, the U.S. Government has recently begun to offer training programs for patent, copyright, and trademark administrators of other nations.

There are also other options the United States might pursue to mitigate international piracy. The United States, for example, could more actively participate in international intellectual property for a, the positive and negative aspects of which have already been discussed.

To complement these efforts, the United States could also encourage U.S. industry, both producers and users of intellectual property products, to participate more actively in international associations that fight international piracy. Such associations include, for example, the International Federation for Phonogram and Videogram Producers (IFPI), the Federation Against Software Theft (FAST), and the Federation Against Copyright Theft (FACT).[107]

The United States might also expand current talks with developing countries on intellectual property law and piracy of U.S. products. These seminars, which might be either bilateral *or* sponsored through a multilateral agency, could provide developing countries with information on how to construct adequate and effective intellectual property laws and enforcement mechanisms. They might also be used to outline the importance of protecting intellectual property rights for developing nations as international trade partners, as well as for the growth of their domestic intellectual property industries.

A more coercive option would be to impose trade sanctions or other retaliatory measures on nations that do not enforce U.S. intellectual property rights. This option, however, entails trade-offs in terms of the political discordance that such sanctions might provoke between developing nations and the United States. Some trade experts, for example, warn "that with no international consensus on how to defend intellectual property rights, any attempt to impose U.S. views on others could jeopardize efforts to improve agricultural and manufacturing trade. "108

Growing Convergence of International Intellectual Property Issues With Other International Issues

Nations have come to view information and information-based products and services as components for improved productivity and

[105]Michael Kirk, Assistant Commissioner for External Affairs, United States Patent and Trademark Office, Department of Commerce, testimony on "Copyright Enforcement, before the Subcommittee on Patents, Trademarks, and Copyright, Senate Committee on the Judiciary, Apr. 17, 1985, p. 7.

[106]For a good case study of U.S. bilateral efforts to reduce piracy in a nation, see "Protection From Commercial Counterfeiters in Taiwan for U.S. Firms, " Law *and Policy in International Business,* vol. 16, No. 2, 1984.

[107]A current example of industry efforts to reduce international piracy of U.S. products is Ashton Tate's cooperation with the International Trade Administration, the Association of Data Processing Service Organizations (ADAPSO), Lotus Development Corp., MicroPro International, and other software companies to develop a series of seminars on intellectual property rights and regulations for exporting software. They are also considering the establishment of '{an industry-financed war chest to provide funds to fight piracy through legal channels as well as through public education. " "Ashton-Tate Fights at Home and Abroad, ' Download, March 1986, pp. 11-12.

[108]Bruce Stokes, "Intellectual Piracy Captures the Attention of the President and Congress, " *National Journal,* Feb. 22, 1986, pp. 443-445.

international competitiveness, international trade, and as a means to achieve major societal goals. As a result, international intellectual property issues are increasingly tied to international competitiveness, trade, development, and political issues. These linkages, together with the growing convergence of communication and information technologies, are creating new intersections between international intellectual property issues and other international issues, such as space and telecommunication issues.

The convergence of information and information-based products and services and communication technologies is largely due to the overall goal shared by many nations to build information infrastructures for both social and economic development.[109] As information and information-based products and services are increasingly used with electronic communication systems, the communication policies that govern such systems intersect with intellectual property policies. Thus, products and services that have traditionally been regulated separately are now used in new combinations:

> Current changes in technology are producing new patterns, with traditional services being combined into unexpected hybrid shapes and uses, in defiance of the established categories. . . Cable systems can be combined with terrestrial broadcasting, and either one or both of these with satellite systems. The combination of technical systems corresponds to an integration of services: television and facsimile combine in telefacsimile; the data bases used for electronic photocomposing can also be used for information retrieval. The combination of television and telephone is at the origin of the videophone, and these, together with computerized data systems, result in teletext and videotex services. In fact, certain videotex services already represent a combination of telecommunications, computer, broadcasting, print, and information systems.[110]

Because of these new combinations, new uses and distribution channels are developing that may have been unanticipated by the legal system. Consequently, two traditionally unrelated legal or regulatory regimes are now in contact with each other. Conflicts may arise when these regimes have mutually exclusive policy objectives.

A case in point is the unavoidable satellite spillover or footprints that cut across national frontiers. While this spillover is not materially different from spillover in terrestrial broadcasting, it is, however, much greater in scope and subject to different legal protections and regimes. Under the Radio Regulations of the International Telecommunications Union (ITU), space is considered common property, for example, which cannot be owned by individuals, corporations, or governments.[111] Although such regulations recognize the privacy of transmissions, there are no enforcement mechanisms or remedies for the violation of rights. Not finding this spillover acceptable and wanting to enforce their rights, rights owners have insisted on extended protection. Their demands, however, conflict with the internationally agreed upon principle of the law of the commons, which has developed in the context of space and telecommunications law. Thus, efforts to protect the intellectual property embodied in satellite signals may need to be handled in widely differing legal and regulatory contexts.[112]

Also exemplifying the multifaceted nature of intellectual property issues is the increasing number of institutions that deal with such issues. At present, the World Intellectual Property Organization deals with the administration of rights; the United Nations Educational, Scientific, and Cultural Organization oversees international information flows for the benefit of education, science, and culture, and develops communications policies for the development of infrastructures; the International Telecommunications Union allocates frequency

[109] In an information society, such that it is envisioned, there will be a greater interdependence between information and communication technologies as nations seek to construct what the French Government calls "the entire nervous system of social organization." Simon Nora and Alain Mine, *The Computerization of Society* (Cambridge, MA: MIT Press, 1980).

[110] "Edward W. Ploman and L. Clark Hamilton, *Copyright: Intellectual Property in an information Age* (London: Routledge & Kegan Paul), p. 151.

[111] See Article N28/7 of the Radio Regulations, also the Final Acts of the World Administrative Radio Conference—Broadcasting Satellites, 1977.

[112] "Edward W. Ploman and L. Clark Hamilton, *Copyright: Intellectual Property in the Information Age.* (London: Routledge & Kegan Paul, 1980), p. 155.

bands and promulgates technical standards in the area of telecommunications; the United Nations Centre on Translational Corporations oversees transborder information-related services; and the United Nations Conference on Trade and Development and the General Agreement on Tariffs and Trade regulate the trade of some information-based products and services.[113]

Policy Implications

Because the present set of international legal and regulatory regimes and institutions are generally linked to a particular technology, new combinations of older technologies might, like new technologies, create inconsistencies between traditionally separate policies and institutions. To deal with such cross-cutting issues, the international protection for intellectual property may need to be considered in a larger social, legal, and technical context. The United States, therefore, might want to develop an integrated approach or policy to deal with the cross-cutting nature of international issues. In addition, it may need to improve the coordination among domestic agencies that are responsible for international and intellectual property issues.

Currently, there is no agency in the U.S. Government that has centralized responsibilities for dealing with the cross-cutting international intellectual property issues. Instead, various Federal agencies perform different and separate functions with respect to international intellectual property rights. [114]

The Department of State plays a lead role in coordinating other Federal agencies and representing the United States at multilateral and bilateral intellectual property negotiations. Both the Patent and Trademark Office and the Copyright Office are responsible for monitoring international legal developments, representing the United States in their respective international conventions, and advising Congress and the Administration on developing international intellectual property policy.

The National Telecommunications and Information Agency (NTIA) plays an important role in the protection of copyrighted material transmitted outside the United States via telecommunication technologies. It also participates in negotiations of international agreements on the use of satellites for rebroadcast materials.

For trade-related international intellectual property issues, the U.S. Trade Representative plays a major role. Its responsibilities include monitoring foreign nations' efforts to protect intellectual property and then, according to such an analysis, recommending whether such nations should be eligible to receive trade preferences. The International Trade Administration also monitors international enforcement of intellectual property rights and provides this information and counseling on export opportunities and problems to the business community. The U.S. International Trade Commission is an independent quasi-judicial agency that determines whether unfair trade acts related to imports, which often involve patent, trademark, or copyright infringements, are harmful to U.S. industries.

The U.S. Information Agency takes primary responsibility for culturally oriented intellectual property policy. It oversees the distribution of U.S. intellectual property products such as films, books, and music to other nations for the promotion of better understanding the United States and its citizens.

Recognizing the fragmentation of policy responsibilities for international intellectual property issues within the Federal Government, several policy coordination groups for intellectual property policy have been recently formed. These groups include the Cabinet Council on Commerce and Trade (Working Group on Intellectual Property), the Trade Policy Committee (Subcommittee on Intellectual Property), and the Senior Interagency Group on Communication and Information Policy (Working Group on Copyright and Intellectual Property).

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[113] Gregorio Garzon Clariana, "Legal Framework for International Information," *Translational Data Report*, vol. **8, No. 2,** pp. 101-107.

[114] These agencies are each described in more detail in Chapter 9, "The Federal Role in the Administration of Intellectual Property Rights."

These efforts to coordinate area good start towards recognizing the many issues involved in international intellectual property policy. However, given the increasing legal, social, political, and economic factors affecting intellectual property rights, the current U.S. Government organization for international intellectual property issues might make it very difficult to address these multifaceted issues in a comprehensive fashion.

To deal with these cross-cutting issues, the United States might establish a governmental agency responsible for both domestic and international intellectual property rights. This agency would subsume all the administrative responsibilities of the Copyright Office, the Patent and Trademark Office, and the responsibilities of other agencies involved with intellectual property rights. Internationally, it would represent the United States on all matters that relate to intellectual property rights. Such an agency would also have centralized in-house capabilities to analyze the effects of new technological developments on the international intellectual property system and the U.S. position in relation to the system. Using this analysis, it could advise Congress on possible domestic and international intellectual property strategies.

At the same time, the establishment of such an agency has several drawbacks. The consolidation of responsibility for intellectual property rights, for example, would take expertise on intellectual property rights from agencies that need it, such as the Department of Commerce and the Library of Congress. Similarly, consolidation might also inhibit existing access to expertise on legal, trade, and foreign policy, made possible by multi-agency involvement. Finally, such a proposal would probably meet resistance from the agencies themselves.

IMPLICATIONS FOR FUTURE U.S. INTERNATIONAL INTELLECTUAL PROPERTY POLICY

As described throughout this chapter, the United States is undertaking and considering many options to address international intellectual property issues. Table 8-5 summarizes some of the major policy strategies available to the United States for dealing with many of the international intellectual property issues brought about by new technologies. It further gives major examples, issues or stresses that would be addressed, and suggests both positive and negative outcomes of such strategies.

There is no single, clear-cut strategy that the United States could adopt to comprehensively address all of the international intellectual property issues engendered by new technologies. A policy strategy designed to deal with international trade and enforcement issues, such as those already legislated (sections of the Trade and Tariff Act of 1984 and the Caribbean Basin Economic Recovery Act), for example, fails to address any of the international political issues presented by new technologies. Strategies designed to focus on political issues, moreover, do not readily address international intellectual property trade issues.

In fact, many policy strategies designed to address specific issues may exacerbate other stresses on the international intellectual property system. Treating intellectual property, for example, solely as international trade issues could provoke problems of international political relations, even to the point of inciting retaliation from other nations; but focus on international political relations might foreclose export opportunities for the U.S. domestic intellectual property industry. Similarly, treating international intellectual property issues as separate from other international policies might lead to conflicts with international information and communication policies and other foreign policies.

Although many of the policy strategies for addressing international intellectual property issues are not mutually exclusive, the United

Table 8-5.—Policy Options for Addressing International Intellectual Property Issues

Policy action	Examples	Issues or stresses to be addressed	Possible positive outcomes	Possible negative outcomes
Ratify the Berne Convent Ion for the Protection of Literary and Artistic Works		Internationalization of intellectual property Political Legal Enforcement	U.S. would appear more genuine in its support for international Intellectual property protection, and consequently it might be more effective in convincing other nations to enact legal and enforcement measures for Intellectual property protection and to ratify International intellectual property agreements U.S. might have more political strength from which to Influence International Intellectual property policy development.	Disrupts traditional U S intel - lectual property laws and practices, such as registration and deposit
Rejoin United Nations Educational and Cultural Organization (UNESCO)		Internationalization of intellectual property Political Legal Enforcement	U.S. would appear more genuine in its support for international Intellectual property protection, and consequently it might be more effective in convincing other nations to enact legal and enforcement measures for Intellectual property protection and to ratify international intellectual property agreements U.S. might have more political strength from which to influence International Intellectual property policy development U.S. might Increase its ability to Influence the number and subjects of studies on copyright and new technologies undertaken by the UCC	U S would need to make economic and political concessions particularly to address the concerns of developing nations Requires additional funding
Negotiations, education seminars, and training programs on intellectual property rights for other nations	U.S. representatives involved with intellectual property could organize seminars and train - ilng programs for foreign officials responsible for the administration of Intellectual property rights, such as those already undertaken in Indonesia, Malaysia, and Thailand.	Political Legal Enforcement	Provide other countries with an understanding of the importance of protecting intellectual property rights. Promote international harmonization of nations' domestic Intellectual property laws	Requires additional funding
Bilateral intellectual property agreements with nations that are not members of any international Intellectual property agreements	Where countries are not members of international Intellectual property conventions, the United States could establish specific bilateral Intellectual property agreements, such as those already established with Romania, South Africa. and Thailand.	Legal Enforcement	Permit the establishment of Intellectual property relations with countries that are currently not members of any international intellectual property agreements	Disrupts Integrity of traditional system of international Intellectual property ageements.
Legislation with specific international reciprocity clauses	Domestic legislation that would make specific intellectual property rights in the United States available to foreign nationals only if their nation granted comparable rights to U S nationals, such as those reciprocity clauses in the Semiconductor Chip Protection Act (Public Law 98-620) and the proposed International Computer Software Protect Ion Act of 1985 (S. 399, 99th Congress)	Legal Enforcement	Provide leverage to induce other nations to enact adequate and/or enforce international intellectual property rights	Disrupts integrity of traditional system of international Intellectual property agreements

Table 8-5.— Policy Options for Addressing International Intellectual Property Issues—Continued

Policy action	Examples	Issues or stresses to be addressed	Possible positive outcomes	Possible negative outcomes
Trade preferences contingent on nations' laws and efforts to enforce International Intellectual property rights	Where countries receive trade preferences and/or foreign aid and do not have adequate laws or enforcement measures for the protection of Intellectual property, the United States could make the receiving of such benefits contingent upon the improvement of Intellectual property laws and enforcement efforts, as called for in the Trade and Tariff Act of 1984 (Public Law 98-573) and in the Caribbean Basin Economic Recovery Act (Public Law 98-67).	Trade and Economic Enforcement	Provide leverage to induce other nations to enact adequate legal protection and/or enforce International Intellectual property rights	Provokes new difficulties for U.S. international political relations
Trade sanctions against nations which do not respect international Intellectual property rights	Information-based products and services could be included in international trade agreements that have trade sanction penalties already in place, such as in the General Agreement on Tariffs and Trade (GATT), Imposition of trade penalties on nations that import goods that infringe U.S. intellectual property rights, such as the penalties called for in the Process Patent Amendment (S.1543 and H R. 1069, 99th Congress).	Trade and Economic Enforcement	Provide a retaliatory mechanism against nations that do not have adequate legal protection and/or do not adequately enforce international intellectual property rights.	Provokes new difficulties for U.S. International political relations and/or retaliation from other nations, particularly from developing nations
Strengthen U.S. Government-sponsored information distribution programs	Increased funding with focus on–developing countries' specific needs for information - based products and services, such as those distibution programs sponsored by the U S information Agency (US! A), the Peace Corps, and the Library of Congress.	Political	Promote International political and cultural understanding. Provide incentives for countries to respect international Intellectual property rights.	Requires additional funding
Foreign aid to nations for purchase of Intellectual property products	Funding for developing countries specifically earmarked for the purchase of information - based products and services.	Political	Promote International political and cultural understanding. Provide incentives for countries to respect international Intellectual property rights. Promote the development of domestic intellectual property industnes in other nations.	Requires additional funding.
Permanent coordinating body for all government agencies involved with intellectual property issues	Standing coordinating body that would consist of representatives from all agencies involved with Intellectual property rights Issues, such as the working groups of the Cabinet Council on Commerce and Trade, the Trade Policy Committee, and the Interagency Group on Communications and Information Policy	Institutional	Provide a forum for better coordination among the governmental agencies responsible for various aspects of international intellectual property protection	Complicates decisionmaking process for International intellectual property policy by decentralizing Individual agencies' policymaking responsibilities
Establishment of government agency for Intellectual property	Combining under the jurisdiction of one governmental agency all of the responsibilities for the administration of Intellectual property rights, includlng all International intellectual property policies,	Institutional	Provide a mechanism for presenting a more united U.S. position on international intel. lectual property issues. Provide a mechanism to centralize expertise on foreign policy and Intellectual property within the Federal Government.	Loss of direct access to expertise or Intellectual property protection needed by individual government agencies

SOURCE Office of Technology Assessment

States must recognize the trade-offs involved in choosing one policy strategy over another, or the possibility that two policy strategies might conflict. Given such potential policy conflicts, the United States will need to make fundamental decisions about how it wishes to view intellectual property (for example, as an item of trade, an item to enhance its foreign diplomatic relations, etc.) and design its overall international intellectual property policy strategies accordingly. Such decisions are likely to become more important in light of the enhanced role of the new technologies in economic and social development. Decisions about international intellectual policy, moreover, will need to be made in conjunction with many other aspects of U.S. foreign policy—from international issues of defense, trade, and foreign aid to issues of international information and communication policy.