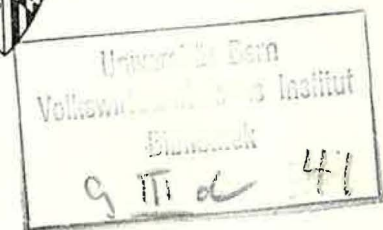


THE ECONOMICS OF THE INTERNATIONAL PATENT SYSTEM

BY
EDITH TILTON PENROSE



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IN MEMORIAM

GEORGE ALBERT TILTON, JR.

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FOREWORD

In welcoming this book, I am also saying "Welcome back!" to economists re-entering the discussion of patent policy.

During the great patent controversy of the Nineteenth Century, which almost led to the abolition of the Patent System in England and in Germany and did lead to its temporary abolition in Holland, economists were in the center of the debate. On the political scene neither the abolitionists nor the conservatives carried the day; instead, the reformists emerged victoriously, obtaining provisions in the patent laws of several countries to prevent "abuses of the monopoly grant" and to permit the use of compulsory licensing. Be it because reform was a less glamorous cause to fight for than abolition, be it because reform implied legal intricacies that are the jurist's preserve, be it because patent lawyers and special interests contrived to bar economists from the legislative committee rooms and lobbies, whatever the reasons may have been, economists retired from the debate. Judging from the share which the subject of patents has had in the literary output of economists of the last fifty years, and from the share which economists have had in the literature on the subject of patents, one may say that economists have virtually relinquished the field. Patent lawyers were probably glad to see them go; some said as much with disarming frankness.

This is a deplorable situation. One cannot argue the relative merits or demerits of various features of the patent system without analyzing the social costs and benefits involved. This is economic analysis and no amount of legal training or engineering experience or technological research

will equip the "expert" for it. Yet, most of the economic theories enunciated in discussions about patent reform have come from lawyers, engineers and technical experts with occasional contributions from business executives. One has only to go to the published record and check the professional qualifications of the witnesses heard by United States congressional committees on patents to verify this statement.

The discussion of the economics of the international patent system, and in particular of the international patent Convention, has been almost devoid of contributions by *bona fide* economists. The international patent Convention is now 67 years old and the literature on it is by no means small. But scrutinize it and you will find only a handful of economists writing on the subject, and even they address themselves more to peripheral issues than to the fundamental economic issue—the balance of costs and gains.

The book by Dr. Edith Penrose is the first of its kind. It constitutes a contribution to economic history as well as to economic analysis. While the history of the international patent Convention from a legal point of view has frequently been recounted, its history from an economic point of view has not been discussed. Mrs. Penrose now presents us with an economic interpretation of the Convention. This part of her book will be read with great interest by economists, historians, and lawyers. While the material will be novel to most, it is not controversial. On the other hand, the economic analysis of the international patent system is both novel and controversial. The parts of the study that deal with the economic evaluation of various provisions of the patent system will undoubtedly draw fire, because several dogmas which legal experts have held in great respect are exposed to the bright searchlight of a skilled economic analyst and are shown to be untenable. One may safely predict that many members of the American patent bar, and especially international patent lawyers, will intensely dislike

some of the views expressed and perhaps all of the suggestions contained in this book.

But the views and suggestions of Mrs. Penrose are not out of line with the current thinking of the more enlightened patent experts. Preparing the ground for the British Patents and Designs Act of 1949, the Second Interim Report of the Swan Committee (Cmd. 6789 of April 1946) declared "that it is wrong in principle that a patent should be used to establish a monopoly wider in scope and longer in duration than that conferred by a patent in itself, and it is obviously desirable that the patent law should keep in step with any measures which may be adopted in the future to limit or control monopoly in the public interest." Mrs. Penrose's recommendation that the International Patent Convention should keep in step with this development is very much to the point and deserves to be well heeded when the Convention comes up for revision in the near future.

It is also appropriate that I should acknowledge the grants in aid of the research that underlies this book. For several years I have been engaged in research on the economics of the patent system and have received grants from the Social Science Research Council, the American Philosophical Society, and the Lessing Rosenthal Fund for Economic Research at The Johns Hopkins University. Thanks to this financial assistance I was able to secure the collaboration of Mrs. Penrose, who spent her time on the international aspects of the patent system. This book is the result of her work, but without the financial support from the organizations mentioned the study would not have been possible.

Fritz Machlup

THE JOHNS HOPKINS UNIVERSITY

PREFACE

. . . nous avons toutefois à nous souvenir que les vérités que nous invoquons, n'ont point la force d'axiomes: les affirmer sans les discuter, serait de la présomption; les discuter sans chercher à convaincre, serait de la faiblesse.

E. Picard et X. Olin, *Traité des brevets d'invention et de la contrefaçon industrielle* (Brussels, 186-), p. viii.

Although the patent system has developed primarily to promote economic ends, economists have devoted very little attention to it and none at all to the international patent system. Jurists and legal students on the continent of Europe have produced a large number of monographs and treatises on the patent provisions of the International Convention for the Protection of Industrial Property but no one has yet attempted a systematic economic analysis of the principles of the Convention. There is only one published work in English on the Convention and that, too, is by a legal student. The following study is an attempt to remedy this deficiency. As far as possible I have avoided legal questions, which existing publications have extensively discussed, and have confined myself to an analysis of the economic principles on which the patent provisions of the Convention rest and to an evaluation of these provisions from an economic point of view.

However, since economic studies of the international patent system have been so persistently neglected, our knowledge of many of the relevant facts is woefully inadequate. Most of the commonly accepted notions about the international patent system rest on extremely shaky foundations, and I hope that the analysis presented here provides a fruitful framework for further investigation.

It is a pleasure to acknowledge the help I have received in the preparation of this study. Professor Fritz Machlup of The Johns Hopkins University has followed very closely the evolution of every draft and it is to his stimulating, rigorous, yet nonetheless encouraging criticism at every point that I must give a great deal of the credit for whatever merit this study may possess. Some of the material in Chapter II has already appeared in an article in the May 1950 issue of the *Journal of Economic History* written jointly with Fritz Machlup. Many of the pages of the book are immensely improved because of the criticism of Dr. Robert Rennie of The Johns Hopkins University. Mr. Roger Dixon of the Department of State read the manuscript and made many valuable suggestions but it cannot, of course, be assumed that he is in accord with my conclusions. Mr. Marcel Silberstein of Basel, Switzerland, provided me with useful materials on the development of the European patent systems. Angela and Lilly Lavarello did an excellent job of the typing. My husband, Professor E. F. Penrose, read the manuscript carefully and I am greatly indebted to his criticism of the style as well as the content. The shortcomings of the study are entirely my responsibility.

EDITH TILTON PENROSE

May, 1951
The Johns Hopkins University
Baltimore, Maryland

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CHAPTER I

HISTORICAL INTRODUCTION

THE INTERNATIONAL patent system as we know it today consists of a complex structure of national laws and customs, international private agreements and practices, and intergovernmental conventions and arrangements regarding patents of invention. This network of patent laws and practices can be called a "system" only in a very loose sense. There is uniformity in neither the subject matter nor the scope nor even the purposes of the various national patent laws, although international agreements have eliminated some of the grosser divergencies of earlier times. Within countries the problems of interpretation and of defining boundary lines are so great that extreme uncertainty attaches to the application of the statute law by the courts.

The phrase "patent system" is used, therefore, as a convenient omnibus term to cover a complicated set of legal arrangements and customs. In spite of this legal complexity, however, the economic principles of the patent system are relatively straightforward. All patent laws have this much in common: they purport to encourage invention and their method is to secure to the patentee a certain control over the use of the invention for which he has succeeded in obtaining a patent. This control derives from his right to exclude others from using the invention except on his own terms.¹ Thus a patent is a monopoly grant. It enables those

¹ This statement applies in its full rigor only to the patent law of the United States. The patent laws of other countries impose some restrictions on the right of the patentee to do as he pleases with his patent without regard to the public interest, and even in the United States a patentee is to some extent restricted by other laws, notably the anti-trust laws.

who hold rights under it to control the output, and, within the limits set by demand, the price of the patented products.

Early History of the Patent System

Evidences of grants to private individuals by kings and rulers of exclusive rights to exercise a trade, or sell a product or use a process occur in many curious places in the records of history.² Such grants are an obvious method of reward or indication of favor and it would indeed be surprising if they had not been used in some form in most communities. By the 14th century we find numerous examples in Europe of privileges granted to innovators and in the 15th century the systematic use of monopoly privileges for inventors for the encouragement of invention emerges in Venice. In 1474, according to the historian Romanin, the Venetian Republic generally promised privileges of ten years to inventors of new arts and machines.³ This has been called "the first patent law" and nearly one hundred privileges for industrial inventions appear to have been granted or applied for between the years 1475 and 1550.⁴ Thus 15th century Venice possessed a fairly well developed patent system for inventors. The utility and novelty of the invention were apparently important considerations in the granting of a privilege and the inventor was required to put his invention into practice within a specified time.

In the 16th century patents were widely used by some of the German princes. August of Saxony in particular took a great interest in inventions; he received important revenues

² For a discussion of some of the early patents see A. A. Gomme, *Patents of Invention* (London: 1936); M. Frumkin, "The Origin of Patents," *Journal of the Patent Office Society*, v. 27 (1945); F. D. Prager, "A History of Intellectual Property from 1545 to 1787," *Journal of the Patent Office Society*, v. 26 (1944); and Harold G. Fox, *Monopolies and Patents* (Toronto: 1947).

³ S. Romanin, *Storia documentata di Venezia* (Venice: 1855), v. 4, p. 485. After listing several privileges, Romanin writes, "In general, privileges of ten years were promised to inventors of new engines and machines." He cites the source of his statement (Provveditori de Comun, libro detto Maggiore, 1474, p. 89) but does not quote the text.

⁴ A. A. Gomme, p. 7.

from mines and was much concerned with methods of improving mine drainage for which he gave several patent privileges. August did not approve of granting privileges to others than the true inventor or for the mere improvement of a process or product. For example, in correspondence regarding a privilege for a newly invented type of stove that had been requested by the heirs and partners of an inventor he wrote:

. . . we are not, thanks to God, so grossly unwise and even ungracious not to consider it as just that inventors of novel, useful and wholesome things should receive and obtain due and grateful reward and respect. But we do entertain fair misgivings about giving a ten year consent for their selfish ends to those who did not invent the [process] but merely purchased it from the inventor for their own profit in order to put a levy and burden upon almost the entire country. . . .⁵

The texts of several of these old privileges have been published and it is clear that the grounds on which the privileges were granted were essentially the same as those of the modern patent. Utility, novelty and working,⁶ for example, were important considerations.⁷

It appears then, that certain German princes had arrived at a definite "patent policy" for inventions at the time when similar policies in France and England were just getting started:

As one looks closer into the German protection of invention in the 16th century, the end of the Middle Ages and the beginning of modern times, one can establish the contents of a whole group of German inventors' privileges, and the content of these privileges shows, that already at

⁵ The privilege requested was finally granted in 1558. Text of documents quoted by Fritz Hoffman, "Beiträge zur Geschichte des Erfindungsschutzes in Deutschland im sechzehnten Jahrhundert," *Zeitschrift für Industrierecht*, 10. Jr. 8 (April 1915), p. 89.

⁶ The phrase "working a patent" is an unfortunate piece of technical jargon, but it is so widely used that it would be inconvenient to reject it now. It means, of course, producing with the use of the patented invention.

⁷ "From it [examination of text of privileges] it can be shown that in general the granting of inventors' privileges rested on the same considerations of legal philosophy as does the justification for the modern protection of invention." Fritz Hoffman, p. 109.

the beginning of the 16th century in Germany, very modern principles were applied with reference to inventors' protection, principles which one had formerly assumed had first received expression in England, especially in the English patent law of 1624. . . . One finds particularly that Germany in the 16th century was very well developed economically, and was the land of invention, and that probably this lively activity of inventors led to the protection of invention.⁸

Development of the English Patent System

In England, as elsewhere, the organization of municipal and business life was largely based on special charters, privileges, franchises and licenses, and the patent of innovation was not easily distinguished from other privileges granted by the Crown. Commercial privileges granted to companies of merchants and industrial privileges granted to fabricators were only separate species of the same genus within which intermixture was common.⁹ As early as 1623, however, the inventor's patent was given statutory recognition as a justifiable monopoly to be distinguished from other monopoly privileges.

The power of the guilds to regulate the "mysteries" and control the terms on which they could be practised was frequently exercised to retard innovation. Consequently, when the encouragement of industrial progress became a conscious state policy, the patent of invention was sometimes used to permit innovators to carry on their craft in contravention of guild regulations. Some writers therefore look upon the patent of invention as primarily a means in the beginning of breaking down guild restrictions. Undoubtedly this was important in many cases, but in itself was only one part of the conscious policy of the Crown of encouraging industry

⁸ Fritz Hoffman, p. 86.

⁹ Even early patents granted specifically for inventions did not always use the word in the modern sense, earlier meanings of the word "invent" include "to found," "to establish," "to find." Patents were granted, for example, to those who "invented" a "new feate of merchandise" with newly discovered parts of the world—i. e., to trading companies. See D. Seaborne Davies, "Further Light on the Case of Monopolies," *Law Quarterly Review*, v. 48 (1938), p. 398.

on a national scale, which in turn was part of the general objective of unifying the nation under the central authority, of breaking down the power of the local authorities and of making the country economically independent.¹⁰ In the 16th and 17th centuries it was only in England that the state was integrated enough, the market wide enough over which protection could be assured, the Crown strong enough and public spirited enough, for the inventors' patent of monopoly to become of very great national importance.

Until around 1570, monopoly patents were primarily issued to encourage innovation and invention. Although the desire to encourage the introduction of new arts remained an important reason for the grants of monopoly, other reasons rapidly became more prominent after this time. The monopoly grant was an easy way of rewarding favorites, of securing the loyalty of important personages to the Crown, of attempting to raise money, of establishing a central control over industry, and under Elizabeth and James I it became increasingly used for these purposes.

The public outcry against the restrictive and privileged monopolies, covering, as they did, such daily necessities of life as salt, oils, vinegar, starch and saltpeter, was loud and persistent. Under these early grants the patentees had extensive powers of control. They could search the premises of alleged infringers and seize their goods. These powers were frequently exercised with considerable violence, high-handedness and irresponsibility, and they intensified the

¹⁰ See, for example, E. Lipson, *The Economic History of England* (London: 1931), v. 3, p. 353: "Elizabeth developed the system [of patents] on the basis of exclusive privileges; and the numerous grants issued in the first decade of her reign indicate a deliberate policy on the part of her advisers to make England economically self-sufficing, so far as her natural resources permitted." And E. Wyndham Hulme states: "The Elizabethan policy aimed beyond question, as a perusal of the grants will amply testify, at the introduction of those industries the products of which had hitherto figured most prominently in the list of imports, viz., alum, glass, soap, oils, salt, saltpeter, latten, etc. etc." "The History of the Patent System under the Prerogative and at Common Law," *Law Quarterly Review*, v. 12 (1896), p. 152. Presumably local guild restrictions were not important for commodities largely imported.

popular resentment against the entire system. In many cases there was no pretense that the grant was in consideration of the public welfare. For example, a grant in 1582 to William Harebrowne for the making of salt, was given in part "for 'the relief of the decayed' state of the fortunes of the Harebrownes attributable to losses at sea."¹¹

The granting of patents for the encouragement of industry and the public welfare was a recognized part of the royal prerogative; the creation of monopolies in opposition to the public interest and without any "consideration passing to the public" was in violation of the common law. Hence many of the patents of Elizabeth were illegal, but to challenge them was a dangerous act liable to be interpreted as want of respect for the Queen's prerogative and likely to incur severe penalties imposed in the Queen's Court "for contempt of this our Royal Command." In 1601, however, the revolt in the Commons had reached the point where the Queen, to forestall action adverse to herself, undertook to reform the system, abolish the most obnoxious of the monopolies and submit the rest to the test of the common law. Almost at once (1602) the famous Case of Monopolies, *Darcy v. Allin*, was started in which the patent for the sole importing, selling and making of playing cards was challenged. The outcome of this case finally established that under the common law exclusive grants to exercise a trade for private gain are against the "liberty and benefit of the subjects" and against the common law. At the same time there was no doubt about the legality of grants for the furtherance of the "weal public."¹²

The failure of James I to regulate his monopoly grants according to the common law made necessary the Statute of Monopolies of 1623, which essentially reaffirmed the doc-

¹¹ E. Wyndham Hulme, "The Early History of the English Patent System," *Select Essays in Anglo-American Legal History* (Boston: 1909), v. 3, p. 133.

¹² For an interesting analysis of this case, see H. G. Fox, *Monopolies and Patents*, Appendix Four, especially p. 325.

trine laid down in *Darcy v. Allin*. By the Statute, monopolies were declared void under the common law and damages to persons injured by them were provided for. A significant exception was made in Section 6:

Provided also and be it declared and enacted, that any declaration before mentioned shall not extend to any letters patent and grants of privilege for the term of fourteen years or under, hereafter to be made of the sole working or making of any manner of new manufactures within this Realm, to the true and first inventor and inventors of such manufactures, which others at the time of making such letters patents and grants shall not use, so as also they be not contrary to the law nor mischievous to the State, by raising prices of commodities at home, or hurt of trade, or generally inconvenient; the said fourteen years to be accounted from the date of the first letters patents or grants of such privilege hereafter to be made, but that the same shall be of such force as they should be if this act had never been made and of none other.¹³

This Statute has been called the Magna Charta of the rights of inventors, not because it originated the patent protection of inventors, but because it was the first general law of a modern state to lay down the principle that only the "first and true" inventor of a new manufacture should be granted a monopoly patent.¹⁴

The Statute of Monopolies is the basis of the present British patent law and the direct ancestor of the United States law. It was the only statutory law in Britain (or in any other country¹⁵) for over 150 years, until finally its principles were copied in France in 1791.

Early French History

In France the early history of the patent of invention was also a history of royal favor, capricious and arbitrary but eventually becoming a regularized system existing as an exception to the general abolition of state-sponsored mo-

¹³ 21 Jac. I, cap. 3. A. D. 1623-24.

¹⁴ The "first and true inventor" included the first one to introduce a new art from abroad. See footnote 9, p. 4 above.

¹⁵ The British colonies in America, however, followed the mother country and very early adopted patent provisions.

nopolies. As in the rest of medieval Europe, economic and political life was organized on a group basis. Individuals lived and worked as part of, and under the rules of, municipal corporations, craft guilds, merchant guilds and *corporations* which were in varying degrees regulated by the Crown. The importance of the *corporations* varied from trade to trade, but the control that they exercised over industrial and commercial activity was reinforced and extended by the actions of the Crown, who not only tried to regulate them but to use them as a means of extending the royal authority. In doing this the Crown, in many cases, removed serious abuses and tempered local and irresponsible despotism. It is in this respect that one can speak of "*l'alliance entre la Royauté et le développement des droits individuels.*"¹⁶

The difficulty with this last interpretation, however, is that these "liberalising" actions of the Crown were to a very large extent made necessary by its own previous acts. Under Louis XIV, Colbert, for example, in trying to reconstruct the finances and increase the power and economic strength of the French State in the latter half of the 17th century, vastly increased the bureaucratic regimentation of economic life. At the same time, exceptions to the strict regulations were made, and it was to these exceptions that inventors and innovators had to look in general for support.

The fact that privileges were used to set aside existing regulations has led many writers to stress the importance in France of the early patents as a means of freeing industry from other legal restrictions. We saw that this explanation of the early English patents was not adequate and in France, especially, it is easy to overemphasize the extent to which the guilds controlled economic life.¹⁷ Heckscher points out that the preamble of an edict of 1581 read:

¹⁶ Augustin-Charles Renouard, *Traité des brevets d'invention* (Paris: 1865, 3rd ed.), p. 43.

¹⁷ One writer, for example, states: "In the old times all was in the hands

The majority of the craftsmen of Our Kingdom, particularly in towns, hamlets or other places where there is neither gild master nor warden to test their products, have become so independent that the majority of them [i. e., their products] are not half as good and reliable as they ought to be.¹⁸

As late as 1673 Paris had only sixty legalized guilds (*métiers jurés, corporations, communautés jurées* or *jurands*) and these could have covered only a small number of the trades of the city.¹⁹ It was the monarchy, constantly striving to increase its control over industry through edicts and *reglements*, that created the rigid framework within which industry was carried on.²⁰ Hence the state had to establish a dual system in order to permit innovation. This in itself created a conflict. The guilds frequently opposed the inventors' patents,²¹ and the system under which the *parlements* could alter the terms of the King's patents enabled the vested interests effectively to register their opposition.

There was no general policy distinguishing inventors' privileges from other privileges granted by the Crown until 1762. At this time an edict of the King for the first time laid down some regulations regarding the issuance of inventors' privileges; the period for which they were issued was limited to 15 years, restrictions were placed on inheritance, proof of utility was required and working was obligatory. The purpose of this edict was not so much to encourage

of privileged *corporations*. He who did not belong to one of these associations could not work; those who were members of a *corporation* had to sell or manufacture according to recognized rules." F. Malapert, "Notice historique sur la législation en matière de brevets d'invention," *Journal des Économistes*, 4e ser., v. 3 (1878), p. 100.

¹⁸ Eli F. Heckscher, *Mercantilism* (London: 1935), p. 143.

¹⁹ *Ibid.*

²⁰ "But our kings, who wished to have the prerogatives which had belonged to the Roman emperor, did not abstain from creating new *corporations* or from increasing the number of masters, that is, the number of members of the societies. . . . The kings, and Henry II stated it in his edicts, said that the right to work was a royal privilege (*droit royal*): consequently the creation of *corporations* or of masters was right in their eyes." Malapert, p. 100.

²¹ J. Isoré, "De l'existence des brevets d'invention en droit français avant 1791," *Revue Historique de Droit Français et Étranger*, v. 16 (1937), p. 119.

inventors as to remove some of the abuses surrounding the granting of inventors' privileges.²²

Agitation against the rigid monopolistic regulations and control of industry continued to increase throughout the 18th century. In 1776, the *corporations* were suppressed in the famous edict of Turgot, which was almost immediately superseded and its author dismissed. But the revolution of 1789 resulted in the abolition of the old gild regulations and freed commerce and industry from the old restrictions. Inventors too, were freed from the regulations, but it was not until 1791 that the statutory basis for the patent of invention was established. The principles of the English Act of 1623 became part of French law in that year. The French went much further than the English had done, by declaring that an absolute right of property existed in industrial discoveries.

The Development of the United States Patent Law

The only other patent law established in the 18th century was in the United States. The Constitution gave Congress the power "To promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries." (Art. I, Sec. 8 (8)). The first Federal patent law was passed in 1793.

²² The preamble of this declaration read as follows: "Louis, etc.—The commercial privileges which are designed to reward the industry of inventors or to stimulate industry which languishes in an environment where there is no emulation, have not always been as successful as was expected, whether because these privileges, given for an indefinite time, seemed to be more of an hereditary patrimony than a personal reward to the inventor, whether because they often were given to people who didn't have the necessary ability, or finally, whether because the children, successors or heirs of the holder of the privilege, when given the enjoyment of the privilege by the law, failed to acquire the necessary talents. The failure to exercise these privileges is the more inconvenient because it interferes with liberty without giving the public results it has a right to expect; finally the failure to give publicity to the scope (*titres*) of the privilege often gives the privilege holder the possibility of extending it and of seriously interfering with the industry and work of our subjects." Text translated from *Renouard, op. cit.*, p. 72.

Many of the Colonial governments had granted exclusive privileges to inventors, and several had made special legislative provisions for them. Monopoly privileges, similar to those we have described were granted not only for new invention but also, and sometimes especially, for innovations from abroad. On the other hand, such abuse of these privileges as had occurred in Elizabethan England was sometimes specifically guarded against. In 1641 the Massachusetts legislature decreed: "No monopolies shall be granted or allowed among us, but of such new inventions that are profitable to the Countrie, and that for a short time." Connecticut adopted a similar law in 1672.²³

In the 18th century numerous patent privileges were granted by several colonies, some for inventions and some for establishing new industries according to processes known elsewhere.²⁴ One historian states that

The most numerous monopolies were those designed to protect the local market for an intending manufacturer, without regard to inventions or imported methods; but as the projected industry was usually a new one or one fallen into abeyance, the grantee in most cases might claim credit for introducing his art from another country or province.²⁵

This method of encouraging the importation of new industries gradually disappeared and it was only the patent of invention proper that survived in the Federal Constitution. English law and English practice obviously had a great in-

²³ Massachusetts Body of Liberties, section 9. Text reproduced in William MacDonald, *Select Charters and Other Documents Illustrative of American History, 1606-1775* (New York: 1906), p. 75.

²⁴ Patents were granted to encourage the manufacture of salt, canvas, sperm candles, and the establishment of mills, dry-docks, tobacco factories. V. S. Clark, *History of Manufactures in the United States* (New York: 1929). v. I, p. 50; "Outline of the History of the United States Patent Office," *Journal of the Patent Office Society*, v. 28 (1936), p. 37; W. B. Weeden, *Economic and Social History of New England* (Boston: 1890), p. 495 and p. 655. In 1715 Connecticut specifically provided that "If any person or persons shall set themselves on work to discover any commodities that may be of use for the country, for the bringing in a supply of goods from foreign parts, that is not as yet of use among us, he that discovers it shall have due encouragement granted to him." Quoted from "Outline of the History of the United States Patent Office," p. 36.

²⁵ V. S. Clark, p. 51.

fluence on the colonies, but the relation between the law of England and the law of the colonies was not very clear.²⁶ The desirability of rewarding inventors and innovators and the monopoly method of doing it was widely accepted in America before the formation of the Federal government. There was, so far as we know, no opposition to the adoption of the patent clauses of the constitution²⁷ and very little to the passage of the first patent law in 1790.²⁸

The Patent Controversy of the 19th Century

At the beginning of the 19th century three of the important countries of the world had firmly established patent systems; although the laws of two of them were very recent, the practices on which they were founded were old. The ancient privilege system had given way to a system based on statutory law. The other countries of the world began to fall in line and adopt patent laws.²⁹

²⁶ For a discussion of the relation between English law and the colonies see St. George Leakin Sioussat, "The Theory of the Extension of English Statutes to the Plantations," *Select Essays in Anglo-American Legal History*. Also Walton Hamilton, *Patents and Free Enterprise*, Monograph No. 31, Temporary National Economic Committee (Washington: 1935), pp. 17-18.

²⁷ One of the powers Madison proposed to give the "General Legislature" was the power "To encourage by premiums and provisions, the advancement of useful knowledge and discoveries." At the same time, Charles Pinckney proposed that it should have power "To grant patents for useful inventions." These proposals were referred to committee, in which there was apparently no debate over them, and the present clause of the Constitution was unanimously approved. *The Debates in the Federal Convention of 1787 which Framed the Constitution of the United States of America* (as reported by James Madison), Gaillard Hunt and James Brown Scott, ed. (International Edition, New York: 1920), p. 420 and p. 573.

²⁸ See P. J. Federico, *Record of the Proceedings in Congress Relating to the First Patent and Copyright Laws* (Washington: 1940). In this pamphlet are reprinted all the passages from the Journals of the House and of the Senate referring to the Patent Act of 1790. Also by the same author "The First Patent Act," *Journal of the Patent Office Society*, v. 14 (1932), p. 237.

²⁹ While the European countries were adopting formal patent laws in the early decades of the 19th century, the "privilege system" which preceded the adoption of regularized patent laws was becoming popular in some of the less industrialized non-European countries. The first formal edict in Brazil recognizing inventors' protection was promulgated in 1809, although as early as 1752 Brazil had granted a privilege for ten years for the establishment of a rice decorticating factory in which machinery invented by the patentee would be used, and other producers were prohibited from using these machines. The text

Austria formally established a patent law in 1810, although as early as 1794 a Court Decree had provided for the establishment of a patent system. Russia followed in 1812, Prussia in 1815, Belgium and the Netherlands in 1817, Spain in 1820, Bavaria in 1825, Sardinia in 1826, The Vatican State in 1833, Sweden in 1834, Württemberg in 1836, Portugal in 1837, and Saxonia in 1843.

In what Clapham calls the "long peace of the 19th century"³⁰ after 1815, the economic activity of the Western World quickened enormously. Trade, commerce and industry made great advances, the economic relationships between nations became closer and more complex and the need for international cooperation on matters as diverse as finance and patents became felt. So far as the patent system was concerned, two forces were at work which pulled in opposite directions. On the one hand, the lively industrial activity led to increasing demands from engineers, inventors, and manufacturers for more and better patent protection; the interests of some of the industrial groups in the larger countries led them to conduct an agitation in the smaller countries for the introduction of patent laws. On the other hand, the widening of markets, the extension of the scope and volume of international trade and the accompanying possibilities of economic advance through the international division of labor, which the political economy of the time did not fail to stress, gave rise to the free trade movement

of this privilege read in part: "The grantees will install in the districts where they wish to have the privilege as many machines as will assure them a monopoly in a radius of ten leagues (lieues)." Reproduced in G. A. Bailly, *Protection des Inventions au Brésil* (Paris: 1913), p. xxv.

In 1813 two special laws were passed in Argentina, one "protecting the invention of an American citizen concerning the manufacture of adobe," and another, also to an American citizen, protecting for twelve years his method "de propulsion de embarcaciones." In 1817 the Argentine Constitution enabled the Executive with the approval of the Congress to give privileges to inventors of public useful arts and "establecimientos." See Pedro C. Breuer Moreno, *Derecho Intellectual Comparado* (Buenos Aires: 1912), pp. 76-78.

³⁰ J. H. Clapham, *The Economic Development of France and Germany, 1815-1914* (Cambridge: 1945, 4th ed.), p. 4.

and led to an increased awareness of the monopolistic and restrictive aspects of the patent system.

There was an acute conflict over these questions in Germany where some of the basic problems with respect to the international protection of patentees were very early raised in an extreme form in the patent relations between the states of the German Zollverein. These states had formed a Customs Union in 1833, but each state retained the right to prohibit the introduction of articles into its territory which were the subject of patents that it had issued.³¹ Clearly, if the domestic market of the patentees was to be protected by each state against competition from importers, the old customs boundaries would be re-established with respect to patented articles. This situation created great difficulties and finally an agreement was reached in 1842 under which patentees were to be given the exclusive right of production in their own countries but not the exclusive right to sell.³² Hence they were not protected from competition from the exporters in other states of the Zollverein. This, of course, seriously reduced the value of the patent grant, and great efforts were made and ingenious proposals presented to strengthen the patent system and establish a uniform system for the whole of Germany.³³ Some trade associations, industrialists, and, in particular, engineers, fought for a patent system. Other groups, including especially economists³⁴ fought for the complete abolition of the patent system and were strongly supported by Chancellor Bismarck.

³¹ See discussion in C. Th. von Kleinschrod, *Die internationale Patentgesetzgebung nach ihren Prinzipien nebst Vorschlägen für ein künftiges gemeins deutsches Patentrecht* (Erlangen: 1855), pp. 183-8.

³² A. Pilenko, *Das Recht des Erfinders* (Berlin: 1907), pp. 169-171.

³³ *Ibid.*, p. 96; Kleinschrod, *op. cit.*

³⁴ The *Kongress deutscher Volkswirthe* at its annual meeting in Dresden in 1863 passed a resolution condemning the patent system "by an overwhelming majority." "Bericht über die Verhandlungen des sechsten Kongresses deutscher Volkswirthe zu Dresden am 14., 15., 16. und 17. September," *Vierteljahrsschrift für Volkswirtschaft und Kulturgeschichte, Erster Jahrgang* (1863), v. III, p. 221.

The controversy in Germany was part of a Europe-wide battle over the patent system. Reforms favorable to inventors were being requested in the English and French laws; the enactment of a general patent law was being pressed in Switzerland as well as in Germany. These pressures brought forth a lively opposition from the liberal or free trade camp, which received important political support from commercial interests who felt they would gain from the elimination of patent restrictions. A strong movement for the complete abolition of the patent system arose in many countries. It was so strong in England that some observers thought the law there would be repealed.³⁵ Only in Holland, however, was the patent law actually repealed. In 1869, primarily as a result of free trade ideas, the Dutch repealed the law they had first adopted in 1817. It was not reenacted until 1910.

The general movement against the patent system died out in the last quarter of the century almost as suddenly as it had started. Its weakening was probably associated with the depression of 1873 and with the increasing nationalism and protectionism which arose in most countries as the century drew to a close.³⁶ Shortly after the unification of Germany in 1871 the patent protagonists won their cause and a unified patent law was adopted in the German Reich in 1877.

In Switzerland, a small, highly industrialized country with a long, firmly rooted tradition of free trade, the controversy raged with especial vehemence. Since the Swiss Constitution prohibited the federal government from establishing a general patent system, a popular referendum endorsing an amendment to the Constitution was necessary. This meant that the proponents of a patent law had to reach a popular

³⁵ "It is probable enough that the patent laws will be abolished ere long . . ." *The Economist* (London), June 5, 1869, p. 656.

³⁶ For a description of the controversy see Fritz Machlup and Edith Penrose, "The Patent Controversy in the Nineteenth Century," *The Journal of Economic History*, v. 10 (1950), pp. 1-29.

audience. In 1866 and again in 1882 the people defeated a proposal to enable the Federal Legislature to pass laws to protect industrial property. In 1887 the proposal was accepted.³⁷

Since the Swiss controversy was very largely concerned with issues arising from the international economic and political relations of Switzerland, the Swiss experience in this period is of particular interest for this study and will be used to illustrate some of the arguments in subsequent chapters. Two of the most important industries in Switzerland—the chemical industry and the textile industry—were strongly opposed to the introduction of a patent law, in both cases because of the restrictions it would place on their use of processes developed abroad if foreigners could patent them in Switzerland. The Swiss patent law, when it was finally adopted, excluded inventions which could not be represented by a model. It thus effectively excluded all processes, including chemical processes, from the patent provisions.

This compromise was apparently necessary in order to obtain sufficient agreement to pass any patent law,³⁸ but it left unsatisfied the German chemical industry, which had exerted strong pressure on the Swiss to force the adoption of such a law.³⁹ In the German-Swiss tariff negotiations in 1904, the German government under pressure from the German chemical industry frankly asked for a change in the Swiss patent legislation. The Swiss government at first resisted, but finally gave way and issued a declaration in which Germany was authorized to raise duties on the import of coal-tar dyestuffs from Switzerland if the Swiss patent law was not changed by December 31, 1907.⁴⁰ The law was

³⁷ See E. Guyer, *Einführung in das Schweizerische Erfindungsrecht* (Zürich: 1916), p. 14.

³⁸ *Bericht einer Fraktion der Kommission des Ständerathes für die Frage des Erfindungsschutzes, vertreten durch den Kommissionspräsidenten, Hrn. Gavard.* (April, 1887), p. 22. "Wir leben in der Schweiz von Kompromissen."

³⁹ *Ibid.*, p. 34.

⁴⁰ W. Stuber, *Die Patentierbarkeit der chemischen Erfindungen* (Bern: 1907), pp. 26 ff.

changed in June 1907 and the model clause dropped. On the request of the Basle chemical industry the so-called "*serienpatente*" on chemical process was excluded from the patent law, and on the request of the textile industry chemical processes for the treatment of textile fibres were similarly excluded.

Summary

Today in most countries an inventor can obtain as a matter of right, in fact if not in law,⁴¹ a monopoly privilege or "patent" which protects him from the competition of others in the exploitation of his invention. The economic importance of an invention has little relation to its patentability.⁴² The patent laws rest upon the assumption that it is desirable to encourage invention for its own sake and that a monopoly privilege is the best way of doing it. Exploitation of the invention is not always required. In its earliest beginnings, however, the inventors' privilege was not given indiscriminately as a matter of right, but selectively to encourage or make possible the development of specific products or processes which were considered of economic importance to the state. Competition had little place in the mercantilistic philosophy and innovation had little scope under mercantilistic regulations except insofar as special arrangements were made within the mercantile framework. Among these arrangements the inventors' privileges was one of the most important, although other methods of encouraging inventors were also adopted, such as direct state subsidy, royal patronage or special concessions regarding taxes, or acquisition of materials. The privilege was often

⁴¹ In England today the patent privilege is still *de jure* an act of grace of the Crown—*de facto* it is obtained as a matter of right.

⁴² Most countries exclude from the scope of the patent law certain classes of things. Commonly excluded, for example, are scientific theories, inventions against public law, morals or safety, pharmaceutical compounds, foodstuffs, chemical products.

abused in the sense that it was given ostensibly to reward invention or innovation, but in fact was motivated by a desire to reward court favorites, make money or achieve political objectives. Nonetheless, to the extent that it was a true inventor's privilege, it was frequently a liberalizing device—a device that made more flexible existing monopolistic or regulatory regimes. The intense popular opposition that eventually overthrew the latter was not directed at the former.

Evidences of privileges which bear many of the characteristics of the modern patent were found toward the close of the middle ages and the beginning of modern times. Inventors' privileges were used in parts of Germany, in Venice, in Holland, in Britain and in France by the 15th and 16th centuries. In this chapter we have traced the development of the patent system in the following centuries and have indicated the speed with which it spread in the 19th century. The laws of the various countries have been frequently amended but the basic principles remain the same as they appeared in the 16th century privileges when the economy of the world was loosely connected and primitive in comparison with that of the 20th century.

CHAPTER II

THE RATIONALE OF THE PATENT SYSTEM

THE PATENT SYSTEM as it stands today has to a considerable extent "just growed," without much reference to fundamental principles, escaping the social planning of men into unexpected byways, some of which have become major and well traveled thoroughfares. Conscious legislative modifications of social institutions tend to lag behind the modifications effected by the adaptations to a changing environment which occur through the uncoordinated actions of individuals or groups of human beings.

Adaptations of this sort in human institutions force those responsible for the laws through which the collective policy of society is consciously enunciated, periodically to reconsider those laws in the light of the actual operations of the institutions resting on them. Hence, insofar as the development of an international patent system in response to widening international economic relations has involved agreement between governments, it has forced international debate on the nature and purpose of the patent laws.

As with most social institutions, the patent system has changed in form and function from what it was in the beginning and a discussion of the present international arrangements will gain in perspective if it is preceded by a brief history of the changing rationale of the patent system. This study is not, however, concerned with the question whether national patent laws are economically desirable. It is concerned only with an appraisal of the international

CHAPTER VI

THE ECONOMICS OF THE INTERNATIONAL PROTECTION OF PATENTEES: THE BALANCE OF COSTS AND GAINS

Patent protection aims at achieving an accord in the interest of the entire community between the inventors who advance industry and consumers as a whole.

The industrial interests of a country probably suffer as much if the inventor is not protected at all as they do if his protection is one-sided. (The most one-sided protection would exist if the inventor were guaranteed a perpetual unlimited property in his invention). The practical protection must therefore lie between the two extremes; as to exactly where, there are naturally different opinions. Different peoples are unlike in culture, modes of living, legal traditions, industrial development, etc.; would it not be surprising if, in spite of this, the patent laws of all lands were cast from the same mold?

Obviously it is not correct to say of a particular patent law: this is the only suitable one. Rather can any law be good if it is drawn up with a correct appreciation of the relevant conditions of the country concerned; furthermore, the best patent law is certainly not applicable without change for all the future because even the circumstances to which it was adapted are themselves continually, though slowly, changing.¹

THUS, AT THE HEIGHT of the controversy in Switzerland over the adoption of a patent law, a report to the Swiss Department of Commerce and Agriculture clearly recognized that the provisions of a country's patent law should be adapted to the particular circumstances of that country and that just as the circumstances of different countries are different, so must the most suitable patent laws be different.

With respect to the granting of patents on inventions

¹ B. Frey-Godet und Haller, *Bericht an das Eidg. Handels- und Landwirthschafts-Departement betreffend Verschiedene Fragen Über Einführung des Erfindungsschutzes*. (Bern, 1886), p. 28.

patented and worked in other countries, a conflict between the general interest and the private interests of patentees was widely feared in most countries as a consequence of the extension of patent protection. The extent of the protection granted has varied with, among other things, the different economic conditions of countries. Few countries grant unrestricted patents on such inventions and in many countries the restrictions in the law are so extensive that extremely limited protection is given.² In balancing the costs and gains of extending patent protection to non-resident foreigners without imposing special restrictions and obligations, most countries have considered that the costs exceed the gains.³

Under these circumstances why do most countries accept the principle of granting patents on inventions developed and patented abroad? Before the International Union was created many countries refused to grant patents on inventions already published abroad even when such publication was an official adjunct to a foreign patent grant. The Monte-

² In particular the obligation to work the patent in the country can effectively reduce the protection granted. The effect of compulsory working, strictly enforced, is very close to that of a refusal to grant foreign patents at all. See discussion in Chapter VII.

³ Most countries grant more patents to foreigners than they do to their own nationals. The U. S. Patent Office prepared the following figures for the Temporary National Economic Committee.

Percentage of Total Patents Granted to Foreigners for Various Countries

	(1930-37 unless otherwise indicated)
United States	13.2
Germany	25.8
Great Britain (1930-35)	51.7
France	49.9
Italy	63.8
Canada	90.3
Switzerland (1930-36)	55.6
Japan (1930-36)	24.0
Czechoslovakia	76.1
Holland (1930-35)	80.9
Denmark	66.4
Norway	72.2

Hearings before the Temporary National Economic Committee, Part 3, p. 1152. See also a study by Mark Jefferson, "The Geographical Distribution of Inventiveness," *The Geographical Review*, v. 19 (1929), p. 650.

video Convention of 1889 between the South American states provided that an invention could not be the subject matter of a patent if it had been published in any of the signatory countries. Are there sound economic reasons for the decision that the majority of countries implicitly made when they agreed that each would grant patents on inventions already developed and patented in one of the countries since without such grants foreign inventions would be freely available to all?

We examined in the last chapter the sources of cost and gains associated with an international extension of the patent system. The gains to an individual country are either those received from *granting* patents which stimulate the introduction of invention in foreign industries exporting to that country, or those from *receiving* patents in foreign countries which may stimulate its own invention or, at any rate, enable its patentees to obtain monopoly positions in foreign markets. The first type of gain occurs only if there is a direct and positive relationship between the geographic extension of patent protection and the emergence and use of inventions; the second type may occur whether invention is stimulated or not.

In this chapter the balance of these costs and gains will be examined first from the point of view of individual countries in different economic positions without regard to the effect of the actions of each country on the world as a whole, and secondly from the point of view of the world as a whole.

THE BALANCE FOR SINGLE COUNTRIES

As always when we try to analyze the patent system, the obscurity of the relation between any given degree of protection and the rate of innovation arises to plague us. If the introduction of inventions in the export industries of any country is to an important degree dependent on the expectation of patents abroad, then it is not legitimate to judge the

effect of these patents by comparing the situation in which a patent has been obtained with the situation in which a patent has not been obtained but in which the invention is nevertheless assumed to have been introduced. It is only when inventions in export industries can be assumed for the most part to be independent of the prospect of a patent abroad that we can separate the costs and gains of a system of granting foreign patents from the costs and gains of the inventions themselves. It is necessary, therefore, to consider in the analysis of each case the nature of the relationship between foreign patents and the rate of invention from whichever point of view is relevant, whether that of givers or recipients.

Stimulation of Invention by Granting Patents to Foreign Firms

The first type of gain mentioned—the stimulation of invention in foreign industry—can probably be dismissed as unimportant. A single country would not in general be justified in assuming that merely because it granted patents on inventions developed in other countries, the effect would be such an appreciable stimulation of invention and innovation in foreign industries that imported goods would be cheaper or better than they otherwise would have been. The incentive effect on foreign industry of a monopoly in one additional market would usually be negligible. Hence, purely from the standpoint of its own economic benefit, a single country could conclude that it had nothing to gain and much to lose by including foreign inventions within the protection of its patent law, providing that the direct gain from *granting* foreign patents was the only consideration.

The only situation in which the granting of patents on inventions primarily worked abroad might stimulate invention and cheapen or improve imported goods would be where the country in which the invention originated had a very

small internal market for the product affected by the invention and exports were necessary to the patentee. If patents are important in stimulating invention, then the prospect of being able to obtain a patent in a large industrial country or in several countries might be an important incentive to firms producing primarily for the large market, particularly if the firm were located in a small country.

Consequently, a large country might, by granting patents to foreign firms, obtain cheaper and better imports. Against this, however, must be set the fact that the countries with the largest internal markets for manufactured goods are also the countries with the best developed industries of their own. If a country is highly industrialized the probability is increased that many techniques patented by foreigners not only could be profitably used by domestic industry but also would have been developed independently by domestic inventors. Thus, from this point of view, the granting of patents on inventions worked abroad may prove, even for these countries, to be more of a burden than a benefit.

It seems clear, then, that if the firms in a country could obtain patents abroad regardless of whether foreigners were granted patents in their country, few countries would find it to their advantage to grant patents on foreign inventions, since few would be justified in assuming that the additional incentive to invention resulting from their individual action would offset the cost to them of granting foreign patents.

Gain from Obtaining Patents in Foreign Markets

In general, however, we must assume that only relatively insignificant countries could obtain patent privileges abroad without themselves granting them. The question, then, is whether the gain to any particular economy from obtaining patents in other countries is likely to offset the costs of granting domestic patents to foreign non-resident patentees. A precise answer is, of course, impossible: too many un-

known and unmeasurable factors are involved. The usual procedure of countries faced with the necessity of making decisions on such questions is to ask the opinions of business men, patent agents, and other interested persons and then to try to decide on the basis of the most (politically) convincing arguments. Defective as this procedure is, and prone as it is to give undue weight to the opinions of those who have a personal interest at stake, it is on the whole necessary. An imperfect and incomplete, but perhaps useful, idea of the gains and costs may be obtained from the testimony in such investigations of those who export patentable products and therefore want foreign patents and those who import patentable products and therefore do not wish to see competition among sellers reduced; of those who have an interest in selling patent rights and those who wish to buy them; and of those who wish to restrict foreign use of their inventions and those who fear foreign restrictions on their use of inventions. But if some more or less general economic considerations can be abstracted from the excessively complicated picture, it will become easier to fit the pieces together in the case of any particular country and to understand the interest of the country as a whole.

Our problem is to attempt to compare the probable situation in which the nationals of a country can obtain patents abroad with the situation in which they cannot. Although the gain to a country when its inventors and exporting firms can obtain foreign patents may be considerable, obviously these gains can only accrue to countries whose nationals want foreign patents. Non-industrial countries and countries in the early stages of industrialization are not in this category.

Non-industrial Countries

Many non-industrial countries have entered into agreements with industrial countries concerning the reciprocal

granting of patents but in all cases the arrangements are extremely one-sided. The patent reciprocity that was implied in the Commercial Treaty of 1903 between the United States and China, for example, can hardly be considered as conferring a great benefit on the Chinese.⁴ China agreed to protect United States' inventors from piracies by Chinese nationals but it is difficult to see what gain the Chinese economy obtained by granting "certificates of protection" on the inventions of United States' nationals that had been patented in the United States. At this time, of course, China could not enforce such protection against non-Chinese and insofar as foreign countries could agree among themselves to respect each other's property rights surely the Chinese consumers lost.⁵ The chief advantage of patent protection to foreign exporters to China was the ability to charge higher prices in the Chinese market than they could have charged if they had been faced with competition.

Any country must lose if it grants monopoly privileges in the domestic market which neither improve nor cheapen the goods available, develop its own productive capacity nor obtain for its producers at least equivalent privileges in other markets. No amount of talk about the "economic unity of the world" can hide the fact that some countries with little export trade in industrial goods and few, if any, inventions for sale have nothing to gain from granting patents on

⁴ Article X of this treaty read: "The United States Government allows subjects of China to patent their inventions in the United States and protects them in the use and ownership of such patents. The Government of China now agrees that it will establish a patent office. After this office has been established and special laws with regard to invention have been adopted it will thereupon . . . issue certificates of protection . . . to citizens of the United States on all their patents issued by the United States in respect of articles the sale of which is lawful in China which do not infringe on previous inventions of Chinese subjects." Albert W. Pontius, *Protection Extended to Patents, Designs, Trade-Marks and Copyrights in China, Japan and Korea* (Washington: U. S. Patent Office, 1909), p. 3.

⁵ "On account of the above-mentioned disposition of the Chinese Government to restrain piracies by Chinese subjects the mutual protection of foreigners against one another has seemed the most urgent need." This protection was secured by an exchange of notes with other powers. *Ibid.*, p. 4.

inventions worked and patented aboard except the avoidance of unpleasant foreign retaliation in other directions. In this category are agricultural countries and countries striving to industrialize but exporting primarily raw materials. Strong supporters of the International Union deplore the fact that many of these countries have failed to join the Union. Speaking of the South American states, Ladas comments:

Many of them do not feel interested enough to become members, inasmuch as they believe that they would assume many obligations in exchange for benefits of a meagre character, inasmuch as they are not manufacturing countries. It is necessary that a propaganda should be instituted in these countries, to convince them of the advantages afforded them by the Union. This would seem to be the business of the Bureau, as well as of the League of Nations and, in particular, its Economic Committee.⁶

Whatever advantages may exist for these countries if they joined the International Union—and, as we shall see, there are some—they do not include advantages related to their own economic gain from granting or obtaining patents on invention.

Small Industrial Countries

The balance of costs and gains becomes more difficult to draw up when a country has an appreciable industrial export. If the country is a small one, with a small internal market and fairly specialized export industries, patents in foreign markets may not only be profitable but may be an important incentive to, and protection of, invention and innovation in exporting industries. If there is a relation between patents and the rate of invention and innovation and if industries producing for export do not have a large internal market in addition to export markets, protection of their innovations in foreign markets may be extremely important to them. It would therefore be unrealistic to analyse the gain from patents to such countries on the assumption that innovation

⁶ Ladas, *op. cit.*, p. 808.

in export industries would go on at the same rate with or without patents. On the contrary, the assumption that some inventions are appreciably influenced by the prospect of obtaining foreign patents may have considerable applicability for such countries.

In addition to the direct stimulation of invention, foreign patents may be necessary with respect to some products to enable small industrial countries to retain a competitive position in export markets. Some of the important exports of such countries depend on quality, novelty, the technical virtuosity of skilled and experienced workmen. To the extent that imitation can be eliminated in foreign markets through patents, design patents, trademarks and copyrights, the products will be more easily able to retain their specialty character and thus their markets. Otherwise producers in other countries could imitate many of these innovations and might produce the products more cheaply than the producers originating the innovations. Other countries would then reap the benefit of the innovation and it is quite possible that it would not be profitable for the inventions to be made in the first place, particularly in the small country but perhaps also anywhere, since many of these inventions are not of such basic industrial importance that they would surely have originated somewhere in response to an industrial need. It may fairly reasonably be said of inventions of this sort that they are strongly influenced by the patent incentive.

In a world of trade barriers the patent protection of exports may also enable them to flow over tariff barriers where otherwise they would not have done so. Tariffs around the large industrial markets hit the smaller industrial exporting countries very hard.⁷ Not only do they reduce imports into the larger countries but they also stimulate production of the

⁷ For a revealing account of the effect on a small country of the increasing height of the United States tariff since the first World War, see Dorothy Grant Jacquelin, *Swiss-American Economic Relations* (Geneva: 1939).

same products as those excluded. Patents, on the other hand, prevent competitors from producing exactly the same products and insofar as the patented products have an advantage either technically or because of consumers' preferences over the nearest substitutes, the amount demanded will be less affected by the increase in price due to the tariff restriction, i. e., demand will be less elastic. Thus for some products patents may help to offset the disastrous effect on small countries of tariffs against their exports.

In spite of the restrictions placed on their own use of foreign techniques as a result of patents in the hands of foreign producers, the importance to the smaller industrial countries of patents in foreign markets may well be so great that the gain of an international patent system is worth the cost to the economy as a whole. This can only be true, however, when their important exports are in fields in which patents play a significant role and particularly if they must be sold across tariff barriers.

In addition to the special importance that foreign patents may have in enabling small industrial countries to maintain a specialized export trade, the general effect of foreign patents on the terms of trade must be counted on the credit side so far as a single country is concerned. The patent permits exports to be sold on better terms than they would have been sold without the patent, though not necessarily on better terms than they would have been sold in the absence of invention.

The effect on the commodity terms of trade of inventions which improve old products or create new ones is, of course, indeterminate. All inventions, however, which reduce the cost of production of existing exports influence the commodity terms of trade against the country in which they are introduced. This is obviously no argument against technical progress since it is not the commodity terms of trade that

are relevant in this connection but the so-called "factor" terms of trade. In spite of the adverse movement of the commodity terms of trade, such inventions enable a country to obtain imports at less cost in terms of real resources, and this is the relevant measure of its gain from trade.

However, if in addition a patent can be obtained which prevents foreign competitors from using the cost-reducing process, the producer in the country concerned will not only be able to charge a higher price than he could have charged without the patent protection (assuming for the moment that he would introduce the invention in any case) but will also produce a greater output. The commodity terms of trade will not fully reflect the reduction in the costs of production and at the same time income and employment will be greater in the export industries than they would have been in the absence of the patent. If the country is a small one, the higher price of its patented exports will not appreciably affect the demand for its other (unpatented) exports. If, at the same time, the propensity to import is high (as is likely for a small industrial country) the higher income will result in a higher level of imports and hence the value of both imports and exports will be increased. On the other hand, if the country has granted patents to foreign firms exporting to it, then imports will be more expensive and the net gain to the country which can be attributed to the system of international patenting will be reduced accordingly, and may even be negative.

The Swiss Controversy

In the controversy in Switzerland in the 1880's as to whether the country should adopt a patent law, the danger of losing the possibility of obtaining privileges in foreign markets was frequently cited as an argument in favor of a Swiss patent law while the cost of granting patents to

foreigners was put forward as an argument against any patent law at all.

The Swiss inventors took out a surprising number of patents in foreign countries. Figures published in a report to the Department of Commerce and Agriculture during the controversy showed that Switzerland took out in Great Britain and Italy more patents in relation to its population than did any other foreign country and ranked second among foreign patentees in Austria and the United States.⁸ Some of the Swiss were much concerned over the possibility of losing the right to patent in foreign markets. Since their country was a member of the International Union, the Swiss could obtain patents in other member countries on the same terms as the nationals of those countries even though Switzerland had no patent law at all. But if she did adopt a patent law, she would have to grant protection to foreign patentees without discrimination unless she withdrew from the Union. To withdraw from the Union would not only have been unacceptable politically but would have left the Swiss open to strong foreign retaliation. The admission of countries without a patent law into the Union was largely a matter of strategy; it was argued, correctly as events showed, that the moral pressure of other countries acting together in a Union would assist in bringing such countries into line.⁹ Although it is possible that if the strategy had not worked, the countries with no patent law whatsoever

⁸ *Bericht an das Eidg. Handels- und Landwirthschafts-Departement*, pp. 16-17.

⁹ For example, a Swiss Congress on the question of patents was held in Zurich in 1883 and adopted a resolution urging the acceptance of a patent law. It gave as two of the reasons: "That the recognition of property in inventions, designs and models would have the effect of placing Switzerland on a level with other civilized States and of protecting our industry against the charge, so often made, of unauthorized imitation"; and "That the acceptance of this principle would also have the advantage of making it possible for Switzerland to take the position in the International Union for the Protection of Industrial Property which had been honorably entrusted to it when it was given the management of the Central Bureau of the Union with headquarters at Bern." Schweiz. Congress betreffend die Frage der Einführung des Erfindungsschutzes, abgehalten in Zürich den 24. und 25. Sept. 1883, *Entwurf der Resolutionen*, p. 2.

might have been expelled from the Union,¹⁰ reciprocity of treatment could not be required of them as long as they were in the Union. Hence the Union offered a measure of protection to small countries against pressure from larger countries who wished to see them adopt a patent policy more in the interest of the larger countries than of themselves.

Yet the Swiss were fully aware of the cost to the country if patents were granted on inventions worked abroad. All of the costs to a country of granting patents to foreigners that were discussed in the previous chapter were raised as objections to the granting of any patents at all; of particular concern was the restriction on the freedom of Swiss industry to use foreign inventions. A flood of foreign goods protected by patents against Swiss competition was a widely feared consequence of the adoption of a patent law.

The Zurich Chamber of Commerce made an extensive survey of the attitudes of Swiss industrialists in Zurich in the 1880's and published the results in a report in 1886.¹¹ An extensive opposition to the introduction of any patent law was evident:

The majority of the big industrialists of Zurich are not in favor of the granting of patents. They do not wish to give up the freedom to make use of the improvements of foreign competitors as they see fit. Many see in the present situation the last advantage which remains to them in foreign competition and they do not wish to see it wrenched from their hand. This is held to be the case—as we have especially set out—not only with respect to imitation but particularly with respect to the free development of the play of all forces. This attitude is connected, we must record for the sake of truth, with considerations of tariff policy.¹²

¹⁰ "Should the Swiss be forced to withdraw from the Union, it could easily happen that the Swiss could no longer obtain patents in foreign countries. Already Germany is studying the means of effecting this exclusion. . . ." *Bericht einer Fraktion der Kommission des Ständerathes für die Frage des Erfindungsschutzes*, vertreten durch den Kommissionspräsidenten, Hrn. Gavard (Geneva: 1887), p. 18.

¹¹ Bureau der Kaufmännischen Gesellschaft Zürich, *Über die Einführung des Schutzes der Erfindungen, Muster und Modelle*.

¹² *Ibid.*, p. 52.

Since Switzerland had a low tariff, the fear was widely expressed that foreigners would take out patents in Switzerland, thus preventing Swiss competition, and, protected by the patents, inundate the Swiss market with foreign goods:

Above all, people feared that it [a patent law] would facilitate the introduction of foreign manufactured goods by the foreign holders of Swiss patents because of our own tariff policy, and that we should expect a real flood to the harm of our own industry.¹³

To this argument the proponents of a patent law had only one answer: Switzerland should not grant unrestricted patents to foreigners:

This disadvantage is easily overcome; compulsory working will be introduced in any patent law to be created. It is in the contract connected with the issue of a patent that the invention as a rule should promote domestic needs and advance domestic technique.

Without such provision half of the present friends of patent protection would certainly refuse their support.¹⁴

It was not because the Swiss were agreed that the direct gains from granting foreign patents exceeded the cost to the country that they included protection of inventions patented and worked abroad in the patent law they eventually adopted. As a member of the Union, Switzerland had no choice. Spurred by economic pressure from outside industrial powers, notably Germany,¹⁵ subjected to an intensive internal campaign which was materially assisted by outside groups,¹⁶ encouraged by the "moral suasion" of the Bureau of the International Union whose headquarters was at Berne,¹⁷

¹³ *Bericht*, 1886, p. 15.

¹⁴ *Ibid.*

¹⁵ See page 16 above.

¹⁶ The Swiss were understandably suspicious of the altruistic nature of the interest of outside groups: "Foreign experts and patent agents have very urgently pressed the Swiss to introduce patent and design protection. Because of this many Swiss industrialists instinctively got the idea that an alteration of the present situation was more in the interest of foreigners than of the Swiss and they therefore could not unqualifiedly accept it so long as the tariff policy of neighboring states remained." Bureau der Kaufmännischen Gesellschaft Zürich, *op. cit.*, p. 52.

¹⁷ Switzerland "cannot confine herself merely to enjoying the advantages

the Swiss in 1888 adopted a patent law. Foreigners were granted patents, but the Swiss law not only provided for compulsory licensing and compulsory working;¹⁸ in addition two important industries—chemicals and the textile dyeing industry—were completely excluded from the law by virtue of the so-called “model clause,” which was in force until 1907. In particular, the clause was designed to prevent German chemical firms from patenting chemical processes in Switzerland.¹⁹

It was a hard fight to convince the Swiss that a patent law was a desirable interference with the freedom to use inventions, and one of the chief reasons for the opposition to the establishment of a patent system was the fact that it was necessary to grant patents to foreigners. It seemed to many of the Swiss that a high cost was incurred and no gain whatsoever obtained. To others, the assurance of remaining in the International Union and of being able themselves to obtain patents in foreign countries appeared as a sufficient gain provided that all inventions patented in Switzerland were actually worked in the country.

Most countries have in fact come to the same conclusion as Switzerland, although compulsory working is gradually being replaced by compulsory licensing. Patents on inventions primarily worked abroad are granted, not because a direct benefit is expected from them but for the other reasons I have mentioned, and the use of the patents is restricted in order to prevent damage to domestic industry.

which the Convention offers, for the Conference has expressed the wish with reference to Holland and Switzerland: ‘The States belonging to the Union who have no law regarding all branches of industrial property should as quickly as possible complete their legislation on this question.’ That is clear and categorical.” *Bericht einer Fraktion der Kommission*, p. 17.

¹⁸ Article 9, sections 3 and 4 of the law of 1888 provided that the patent would be cancelled “if the invention has not been worked after the expiration of three years from the date of the application for a patent” and “if the patented object is introduced into Switzerland from abroad and the holder of the patent has refused a license requested by a Swiss on reasonable terms.” *Bundesgesetz betreffend die Erfindungspatente* (Vom 29. Juni 1888).

¹⁹ See page 16 above.

Large Industrial Countries

It has been alleged that an international regime sanctioning foreign patents is chiefly in the interest of larger industrial countries which have an extensive manufacturing export and a high rate of invention. To some extent, as we have seen, the conflict in the international conferences over the extension of the patentees’ privileges has been considered a conflict between the larger industrial countries and the less developed ones. Yet even for the former the balance of costs and gains does not clearly show a net gain.

In the first place there is probably not a very close connection between invention and foreign patents. If a producer has a large domestic market which he can protect by patents, protection in additional markets will not be so important to him as it would be if his domestic market were small. It is highly probable that the introduction of inventions in the large exporting industries of the United States, Germany, or even the United Kingdom would not be appreciably slowed down by an inability to obtain patents in foreign markets. In these countries the domestic market for most industrial products is sufficiently large to enable appreciable monopoly revenue to be obtained from domestic patents. Hence, a very large proportion of the inventions on which United States firms, for example, obtain patents abroad would probably have occurred also without the prospect of foreign patents.²⁰

In the second place, if a significant proportion of the exports of large industrial exporting countries with a low propensity to import are priced higher because of patents than they would otherwise have been, there is likely to be some effect on the ability of foreign importers of industrial products to buy non-patented goods. This of course means

²⁰ Insofar as firms specialize in producing for export alone, a foreign patent will of course be as important as a domestic patent is to a firm producing for the domestic market. But if the domestic market is large an increase in that market is likely to be less important than if the domestic market is small.

that part of the gain to exporters of patented products is at the expense of exporters of other products from the same country.

None of these factors is easily subjected to quantitative evaluation. The most that can be said is that the benefits to the larger industrial countries of being able to take out patents in other countries have probably been much exaggerated. The extent to which the increased income in the industries exporting patentable products is offset by the decreased real incomes of buyers of patented foreign products and of exporters of non-patentable products has never been weighed in the balance. Between the industrial countries this offsetting effect is surely significant; even between industrial and non-industrial countries, the adverse effect on incomes and on the terms of trade of the latter must to some degree reduce their ability to buy industrial products.

Even if one believes that patents do not play an important part in restricting trade compared with other factors, such as large-scale monopolistic organization existing independently of patents, their effect should not be ignored in an appraisal of the costs and gains of an international patent system. On the other hand, it would not be fruitful to pursue the subject in greater detail from the point of view of one country. The fact is that the immediate gain to exporting firms of all industrial countries is so evident that strong pressures would in any case come from them in favor of a regime in which patents can be obtained in foreign countries. Hence in the absence of an organized international system, a system of treaties would grow up providing for reciprocal treatment in the matter of patent rights.²¹ Many countries that clearly have nothing to gain would be forced or persuaded to grant foreign patents.

²¹ For example, even in the Treaty of Washington of 1907, a general treaty of "peace and amity" between Central American countries that had for years

It has been shown that for small industrial countries, the possibility of obtaining foreign patents might be a net gain only if their competitive position is significantly dependent on the maintenance of a special advantage in style, skill, novelty, etc. For larger countries the monopoly gain itself may be sufficient to offset the costs. Other countries have little if anything to gain directly. Whether they lose or not may depend on the terms on which foreign patents are granted, a problem which I leave for later discussion.

THE BALANCE FOR THE WORLD AS A WHOLE

Up to this point the costs and gains of a regime of international patenting have been examined from the point of view of individual countries. If all countries are considered together, several things stand out clearly. In the first place, no net gain accrues to the society of nations except when an increase in invention results from the granting of foreign patents.²² Gains attributable solely to the monopoly obtained by one country are cancelled out by the corresponding costs to other countries. The extension of patent protection over a wider area will influence significantly the rate of invention only if the original protection is small in relation to that needed to encourage a rate of invention near the maximum. The conclusion arrived at earlier seems plausible; that if protection as long as 17 years is granted in a large market, the possibility of obtaining protection in other markets, while indeed welcome to the inventor and innovator, would have very small marginal effect on the rate of invention.

been involved in very serious disputes largely because of revolutionary activities, provisions regarding the treatment of patent rights were included.

²² This remains true whether one assumes full employment or less than full employment. It has been suggested that if unemployment is prevalent, the effect on incomes in a large industrial country of higher export prices due to foreign patents might stimulate activity in that country and thus raise the level of output in the world as a whole. It is possible to construct a theoretical model in which this result would occur but so many unrealistic assumptions have to be made that it is clear the model would have little applicability in the real world.

It can, of course, be argued that although the total number of inventions might be very little affected, the more costly, risky, time consuming and revolutionary inventions, though few in number, need the strongest protection. These are the marginal inventions with respect to any patent system, no matter how extensive, and yet can often be considered the most important. There is probably considerable force in this argument, but two questions are relevant: 1) Is the gain from encouraging this type of invention sufficient to offset the cost of extending further patent protection to all inventions? and 2) if so, is an extension of protection geographically the most effective means of promoting this type of invention?

The first question cannot be answered in general terms. As long as the patent grant gives only a limited protection, claims will be made that additional protection will stimulate additional invention and these claims may be justified. Nonetheless, it is generally agreed that the patent system must have some limits although what these limits should be is clearly debatable. Plausible economic arguments can be made regarding the limits that ought to be set as to patentability, use of the patent, or the territory covered by it. The duration of the patent is a more difficult point. Whether it should extend to, say, 5, 10, or 15 years is a matter of political expediency and compromise. There is no way of determining precisely the most economic duration of patents—primarily because of the great differences between different inventions and different inventors. Some countries make special arrangements for the extension of the time under special conditions rather than general arrangements to include special cases, others omit the special cases altogether.

As to the second question, the length of time over which protection can be obtained is probably more important for the more costly and revolutionary inventions than is a geo-

graphical extension of protection, at least if the original market is large. To a considerable extent the risk and cost of an invention are functions of the period between the making of the invention and its development for full commercial use. Since patents must usually be taken out before the latter stage is reached, the duration of the patent must be long enough to make possible the receipt of the necessary reward after the product is finally successfully launched. There can be little doubt that the prospect of monopoly rewards has in many cases sustained an inventor and his backers through a long and difficult period of launching his invention. Henry Bessemer is one of the best examples. Bessemer testified many times that the patent was essential to him in the development of the Bessemer process—a development both long and costly. His English patents, however, were sufficient to sustain him. He was angry that Prussia would not grant him a patent (claiming his invention was not “new”), but the prospect of returns from foreign patents do not appear to have been necessary to encourage him in his experimentation.²³

The point I am making is clearly debatable, but surely very few inventions in the larger industrial countries have been lost for want of more and better foreign patents and surely few inventions would have been held off the market in the absence of such patents.²⁴ This is not to deny that such

²³ See, for example, his testimony in the Select Committee on Letters Patent, *House of Commons Sessional Papers*, v. 10 (1871), p. 135.

²⁴ There is one interesting type of exception to this: In industrial countries some inventions may be made which are not easy to introduce under the existing organization of production. One of the gains obtained from foreign patents is the opportunity to experiment with markets. A noted patent lawyer remarked: “The enormous strides in quantity production have not always been to the advantage of the inventor; indeed, oftentimes the opposite is the case. Numbers of instances have come within our experience, in which the American inventor has been unable to promote his invention in the United States, and has gone to Europe to make a success of it there, after which, returning to the United States, he has been able to promote the invention successfully in this country . . . it frequently happens that conditions in American

patents, and in particular, the many advantages obtained from patent agreements involving the sharing of technology (and of markets) are extremely profitable to the firms concerned. But taking all countries together, any net increment in invention that can be attributed to foreign patents will more likely come from countries with small domestic markets.

The patent system distributes rewards according to the commercial value of the patent monopoly and the skill of patent lawyers. Some countries will obtain more of these rewards in return for the services of their inventors and lawyers than they pay out for similar services in other countries. Only to these countries does a net monopoly gain accrue, but since this gain is at the expense of other countries, it is no gain for the world as a whole. Invention is the product for which the price is paid and it is difficult to feel even a reasonable degree of confidence in an assertion that the increase in the rate of invention which can be attributed to foreign patents is sufficient to offset the costs of an international patent system.

Yet we cannot arrive at even a tentative conclusion as to the economic desirability of an international patent system from this point of view alone. In all of the preceding argument, I have assumed that the economic purpose of any increase in the amount of patent protection granted to inventors is to obtain more and better inventions, and have clearly implied that if these were not expected to be forthcoming on a sufficient scale to offset the increase in the

industries make it impractical to utilize new inventions which constitute real improvements in the arts." Examples from the automobile industry were cited—design changes in automobiles require a substantial capital investment in the United States under the conditions of mass production, while in Europe this is not so important. Hence inventions of this sort can get adopted more easily. "Quantity production tends always in the direction of manufacturing the goods at the lowest price; it does not tend towards the production of an improved product at a slightly higher price." Thus many inventors of improved products go first to Europe. Lawrence Langner, *Foreign Patents for American Inventions—A Revaluation* (American Manufacturers Export Association, New York: 1927), p. 3.

cost to society of an extension of the patent system, the additional protection should not be granted.²⁵ But inasmuch as the patent system affects the competitive relationships in industry, other considerations must be included in our analysis of the geographical extension of the system. In spite of the uncertain nature of the conclusions, let us assume for the moment—in order to examine these other considerations in isolation—that the extension of the patentees' monopoly to more than one country does not have a sufficient effect on invention to offset the increased restrictions on industry and cost to society as a whole, and let us examine the effect of this conclusion on the question of an international patent system.

If we were to accept the existence of national patent systems but reject an international system, we would have the alternative of either leaving each country free to act as it saw fit regarding the granting of foreign patents or of proposing an international agreement to prohibit foreign patenting. If each country were free to do as it pleased, an extensive development of international patenting would undoubtedly occur because of the pressures on the weaker countries by the stronger industrial ones and because the exporting interests in all industrial countries would insist on a recognition by their government of their own interests; in short, for all of the reasons that have led in the past to numerous treaty arrangements affecting patents and that led to the International Convention in the 1880's. Under these circumstances there is no doubt that some international

²⁵ The assumption that the purpose of the international patent system is to promote invention is a common one. Terrill, for example, writes, "The numerous patent jurisdictions of the world form an interrelated system whose reason for existence, from the standpoint of the world economy, is to promote invention and assist in the wide dissemination of technology and its prompt utilization in industrial improvements." Robert P. Terrill, "Cartels and the International Exchange of Technology," *American Economic Review*, v. 36² (Supplement 1946), p. 757. If this really were the primary justification for the international patent system, I should conclude that the effect on invention was too small to offset the cost of the system.

arrangements regarding the terms on which foreign patents were to be granted would be desirable, partly to protect the weaker countries, partly to prevent excessively nationalistic practices and partly to reduce unnecessary legal complications and inequities.

To abolish international patenting therefore it would be necessary to obtain an international agreement to do so. This is not only politically impractical but economically undesirable. Given the existence of national patent systems, it can be shown that some international arrangements are desirable in order to reduce the influence on the location of industry of the unequal prospects of monopoly profits arising from patents when such profits are entirely unrelated to the underlying economic factors and may even pull industry in a direction inconsistent with the most economic use of resources.

If international patenting were not permitted, a patentee would be able to take out a patent in only one country. This country need not be his own country; he might be required to take out his patent in the country in which he produced or he might be permitted to patent in any country he chose. In either case the patent arrangements would have an undesirable effect on the location of industry catering for the international market.

At first sight it might seem more reasonable that the patentee should be allowed a patent only in the country in which he produces. The choice of plant location for many industries, however, is not independent of market considerations. If, by locating a plant in one area, monopoly profits could be obtained which would be foregone if the plant were located in another area, an intelligent producer would include the possibility of obtaining these profits in his calculations regarding the most profitable location of his plant. Thus a strong incentive would be created for patentees to locate their plants in larger industrial countries merely because

they could there obtain a monopoly profit greater than elsewhere. If the expected monopoly profits were very great, a producer might well find it desirable to incur considerably higher costs of production in order to obtain the protected market. In addition, industrial research and technical innovations would tend to concentrate in these countries.

This tendency for patentees who wish to sell in the larger markets to take out their patents in those markets would have still other consequences. A patent has a double effect within the territory in which it is valid; it prevents others from producing in that territory and it prevents others from selling in that territory. Only the patentees or their assigns can produce or sell the patented products or use the patented processes within the political territory covered by the patent. Outside this territory such products or processes are freed from the patent restrictions. Hence if an invention could only be patented in one country, there would be an incentive for firms who wished to use the invention to establish plants outside the territory covered by the patent and produce for the rest of the world. Thus the exporting industries of the countries in which the larger number of patents were taken out would suffer since, when one firm holds a patent on an important new process, all other firms producing competitive products in that industry are at a disadvantage. They will, of course, try to develop competing processes, but for some inventions this may be extremely difficult or impossible. In industries where all firms produce largely for foreign markets and are in competition with foreign firms in foreign markets, the firms without access to new developments would not only be at a disadvantage *vis-a-vis* the firm holding the patent in the domestic market but also *vis-a-vis* the rest of the world; firms in the rest of the world could freely use any of the new techniques. Not only is the monopolistic position of the patentee firm increased within the domestic industry, but the domestic industry other than the patentee firm

suffers in relation to foreign industry for no sound economic reason.²⁶

If the patentee were not required to produce in the country in which he takes out his patent, the fear of losing and the hope of safe-guarding his patent monopoly in this or that market will not enter into the calculations of the producer in determining the location of his plant. Yet the position of the countries containing the larger markets would be even more adversely affected. The tendency for patents to be concentrated in these markets would be strengthened and, therefore, the restrictions on industry in these countries would be increased. Assume, for example, that a foreign producer exporting to the United States market takes out a process patent in the United States instead of his own country; and that his products are normally competitive with products of domestic firms in the same industry both in the United States and in foreign markets. Because of the patent in the United States no firm in the United States can use the invention either for the domestic market or for export markets. All producers abroad can use the invention since it is protected only in the United States. Hence, while the purpose of the patent in the first instance was to protect the United States market of the foreign firm, it has the additional effect of preventing all use of the invention by United States firms even if they were producing for markets

²⁶ This happened in the early days of the British incandescent lamp industry: "The first incandescent lamp—the Carbon Filament Lamp—was invented simultaneously in 1878 by Swan in England and Edison in America. Although the patents were declared invalid in every other European country, they were upheld in the United Kingdom, and the manufacture of electric lamps in this country thus became, for several years, the monopoly of one company. On the expiry of the Edison and Swan patents other British factories sprang up and a period of expansion in the British lamp industry followed. Meanwhile German manufacturers, having been free from patent restrictions, had progressed even more rapidly, not only in volume of output but also in technique of manufacture and trade organization; and on the lapse of the British patents they were able to send lamps into this country at a price with which British manufacturers had difficulty in competing." Great Britain, *House of Commons Sessional Papers*, v. 23 (1920), Reports of the Standing Committee on the Investigation of Prices and Trusts under the Profiteering Acts, Electric Lamp Industry, p. 3.

in other countries, while at the same time the invention can be used by all non-United States competitors in all other markets. The patentee firm may gain very little by this secondary effect but the restricted firms in the United States may suffer much.

Thus it is clear that a simple agreement to eliminate international patenting would not be a desirable arrangement. If national patents are permitted in industries whose market is international, and if international patenting were not permitted, the fact that patents restrict not only competition in selling, but also any unauthorized production in which the patented invention is employed in the country where the patent is taken out, would lead to uneconomic and inequitable complications and distortions of economic relationships. The industry in the country in which the patent was taken out would be at a disadvantage not only with respect to the firm holding the patent but also with respect to all of its foreign competitors in foreign markets, since the latter would have free access to the invention. It is part of the purpose of the patent system to retard the development of competitors of the patentee in order to enable him to earn a reward for his innovating enterprise, but it is hard to justify a discrimination between these competitors in such a way that one group is retarded—the group unfortunate enough to be in the country selected for the patent—while all others are left free. If the patentee is not allowed to extend his monopoly over the greater part of his market, the patent, in securing protection to the patentee against competitors, automatically discriminates between these competitors on non-economic grounds. This effect alone is sufficient to justify some international arrangement regarding foreign patenting.

Conclusion.

Our examination of the costs of extending the patent

monopoly geographically and of the effect of this extension on the rate of invention showed that the costs were very high and the gains doubtful from the point of view of most countries. Nonetheless, if it is possible to obtain patents within countries, difficulties are automatically created for the international economy because the national patent systems are an important factor influencing the international location of industrial activity. Some international arrangement regarding foreign patenting is therefore desirable. This arrangement should have three functions: 1) So far as possible it should prevent the exploitation of the weaker industrial countries by the stronger. 2) It should reduce the influence of patents on the location of industrial activity. 3) It should reduce the cost to each country of granting patents on inventions developed and primarily worked abroad.

The present International Convention goes a long way in the first direction through its provisions requiring national treatment and eliminating reciprocity requirements. It has attempted to perform the second function by outlawing provisions in national laws prohibiting the importation of patented products, and by the modification of national compulsory working requirements. The development of compulsory licensing is the most important method with respect to the third function, the reduction of the costs of granting foreign patents. Many countries have considered compulsory working to be the most useful method for this purpose. Both compulsory working and compulsory licensing will be examined in the two following chapters and I shall try to show that it is only the latter and not the former that can be considered a desirable and effective method of reducing the cost to a country of granting patents on inventions primarily worked abroad and thus of redressing the unfavorable balance of costs and gains which the granting of patents without conditions would entail.

CHAPTER VII

COMPULSORY WORKING OF FOREIGN PATENTS

ALTHOUGH UNION COUNTRIES have agreed on the principle that the first patentee of an invention has a right to obtain a patent in other countries, they have not agreed on the conditions and limitations that should be imposed on this right. Nearly all countries recognize that an unrestricted patent monopoly imposes an intolerable burden on society and they grant patents only under certain conditions. One of these conditions is designed specifically to prevent foreign patentees from using their patents to protect the market for their exports thus retarding domestic industrial development by denying the invention to domestic industry. In the belief that this danger could be averted by forcing foreign firms to work their patents within the country, most countries have at some time enacted compulsory working provisions in their patent laws.¹ Until recently revocation of the patent was the chief penalty for failure to use the patented invention in countries that had compulsory working provisions.

The Origin of Compulsory Working

The theory that all patents should be worked within the country that granted them arose when the encouragement of industrialization was the chief aim of the patent system. Patents were granted because countries wished to develop their natural resources, and to increase their supply of technicians and skilled labor, and the number and variety of their manufacturing concerns. The purpose was the immediate

¹ Even the United States in the patent law of 1886 provided that the patents of aliens must be worked within the country.

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